Appendix A.9.1 - Part 1

Ground Investigation Reports

A.9.1

Appendix A.9.1.1

Historic Ground Investigation Report

Appendix A.9.1.1.1

N6 Galway City Outer Bypass
Contact 1 Menlough to Garraun North – September to November 2003

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m^3	Test	σ_3 kPa	C kPa	
BH235A	2.50 - 2.73	D	Clayey very sandy GRAVEL				9.1					
BH235A	2.50 - 3.00	B	Clayey very sandy GRAVEL									Particle Size analysis
BH265	0.00 - 0.50	B	Silty very sandy GRAVEL									CBR
BH265	0.50 - 1.00	B	Silty very sandy GRAVEL	57	425µ 29	Sieve NP	21					pH = 8.5 Particle Size analysis SO3 (2:1) = 0.08g/l Passing 2mm = 47%
TP149	0.10	D	MADE GROUND: Slightly sandy slightly gravelly CLAY				29					
TP149	0.50 - 0.75	B	Slightly sandy very gravelly SILT	61 16	425µ 52	Sieve 36	20					CBR Particle Size analysis
TP151	0.10	D	TOPSOIL: Slightly sandy CLAY				22					
TP151	0.10 - 0.40	B	Slightly sandy gravelly SILT	69 13	425µ 50	Sieve 37						w% / Dry Density CBR MCV Particle Size analysis
TP151	0.30	D	Slightly sandy gravelly CLAY				23					
TP161	0.40	D	TOPSOIL: Sandy gravelly CLAY				24					
TP161	0.60	B	Clayey sandy GRAVEL				10					w% / Dry Density pH = 8.2 Particle Size analysis SO3 (2:1) = 0.08g/l Passing 2mm = 34%
TP163	0.15	D	TOPSOIL: Clayey gravelly SAND				9.5					
TP163	0.60	B	Silty very sandy GRAVEL	26	425µ 25	Sieve NP	6.0					pH = 8.2 Particle Size analysis SO3 (2:1) = 0.14g/l Passing 2mm = 41%
TP164	0.10	D	TOPSOIL: Slightly sandy slightly gravelly CLAY				54					

Remarks

Form 10/2

Laboratory - Results Summary

GEOTECH

Project
N6 Galway City Outer Bypass Contract 1
Ground Investigation Menlough to Garraun North
Galway County Council

Contract
KC3209

Sheet
2

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m^3	Test	σ_3 kPa	C kPa	
TP213	0.70	B	Slightly sandy slightly gravelly CLAY	69 9	425µ 23	Sieve 14						CBR Particle Size analysis
TP213	1.70	D	Slightly sandy slightly gravelly CLAY				9.6					
TP215	1.00	D	PEAT				623					
TP215	2.00	D	PEAT				619					Org = 35.5% Passing 2mm = 90%
TP217	0.35	D	TOPSOIL: Clayey very sandy GRAVEL				68					
TP217	0.65	B	Slightly clayey sandy GRAVEL									w% / Dry Density CBR MCV pH = 8.3 Particle Size analysis SO3 (2:1) = 0.06g/l Passing 2mm = 37%
TP219	0.40	D	MADE GROUND: Clayey sandy GRAVEL				5.0					
TP219	0.40	B	MADE GROUND: Clayey sandy GRAVEL									pH = 8.2 Particle Size analysis SO3 (2:1) = 0.06g/l Passing 2mm = 35%
TP222	0.20	D	Slightly clayey slightly sandy matrix				89					
TP224	0.30	D	TOPSOIL: Very clayey gravelly SAND				55					
TP224	0.70	B	Slightly sandy slightly gravelly CLAY	63 8	425µ 22	Sieve 14						w% / Dry Density MCV Particle Size analysis
TP224	1.70	D	Slightly sandy slightly gravelly CLAY				8.0					
TP225	0.20	D	TOPSOIL: Sandy slightly gravelly CLAY				19					
TP225	0.70	B	Sandy slightly gravelly CLAY	75 11	425µ 33	Sieve 22						w% / Dry Density MCV Particle Size analysis
TP225	1.70	D	Sandy slightly gravelly CLAY				16					

Remarks

Form 10/2

Laboratory - Results Summary

GEOTECH

Project
N6 Galway City Outer Bypass Contract 1
Ground Investigation Menlough to Garraun North
Galway County Council

Contract
KC3209

Sheet
6

Samples				Earthworks												
Hole	Depth	Type	Description	CBR Top	CBR Base	CBR Top w%	CBR Base w%	CBR Surch kg.	γ_b Mg/m^3	Comp Type	w% (Opt) <Nat>	γ_d (max) Mg/m^3	ρ_s Mg/m^3	% ret 20/ 37.5 mm	MCV
BH192	0.00-1.20	B	Slightly sandy slightly gravelly to gravelly CLAY	0.6	0.9	14	15	13.6	2.21	2.5kg		1.94		12	
BH265	0.00-0.50	B	Silty very sandy GRAVEL	0.3	0.4	22	20	13.6	2.01	2.5kg		1.66		16	
TP149	0.50-0.75	B	Slightly sandy very gravelly SILT	7.2	10	26	25	13.6	1.77	2.5kg		1.42		59	
TP151	0.10-0.40	B	Slightly sandy gravelly SILT							2.5kg	(26)	(1.47)	2.65	12/	
									1.77	2.5kg	<40>	1.26		2.5	
									1.82	2.5kg	35	1.35			
									1.85	2.5kg	32	1.39			
									1.79	2.5kg	24	1.44			
									1.70	2.5kg	23	1.38			
									1.85	2.5kg	30	1.43			
				0.4	0.5	38	44	13.6	1.76	2.5kg		1.25		11	
									1.73	MCV	36	1.27		11	4.4
TP161	0.60	B	Clayey sandy GRAVEL							2.5kg	(11)	(2.01)	2.65	13/	
				15	14	11	11	13.6	2.23	2.5kg	<11>	2.00		20	
				23	33	11	9.5	13.6	2.19	2.5kg	10	1.99			
				25	36	7.5	6.6	13.6	2.03	2.5kg	7.1	1.90			
				0.3	0.4	15	15	13.6	2.22	2.5kg	15	1.93			
				26	25	9.7	4.8	13.6	2.07	2.5kg	7.2	1.93			
TP164	0.20-0.30	B	Sandy slightly gravelly CLAY/SILT							2.5kg	(22)	(1.63)	2.65	2.1/	
				0.7	0.9	28	27	13.6	1.90	2.5kg	<27>	1.49		0.5	
				1.5	2.0	25	25	13.6	1.95	2.5kg	25	1.56			
				2.7	2.3	23	23	13.6	1.97	2.5kg	23	1.60			
				8.8	6.8	19	21	13.6	1.93	2.5kg	20	1.61			
				18	12	16	16	13.6	1.80	2.5kg	16	1.55			
									1.87	MCV	26	1.49		3	7.3
									1.89	MCV	25	1.52		3	8.2
									1.95	MCV	12	1.74		3	7.2
									1.92	MCV	24	1.54		3	6.3
									2.05	MCV	16	1.78		3	17.9
TP165	0.50-0.70	B	Sandy slightly gravelly CLAY	5.9	6.2	22	22	13.6	1.94	2.5kg		1.59		2	
TP167	0.50-0.70	B	Slightly sandy very gravelly CLAY	5.1	4.4	10	10	13.6	2.26	2.5kg		2.05		29	

Remarks

Form 6/2

Laboratory - Compaction, CBR & MCV Summary

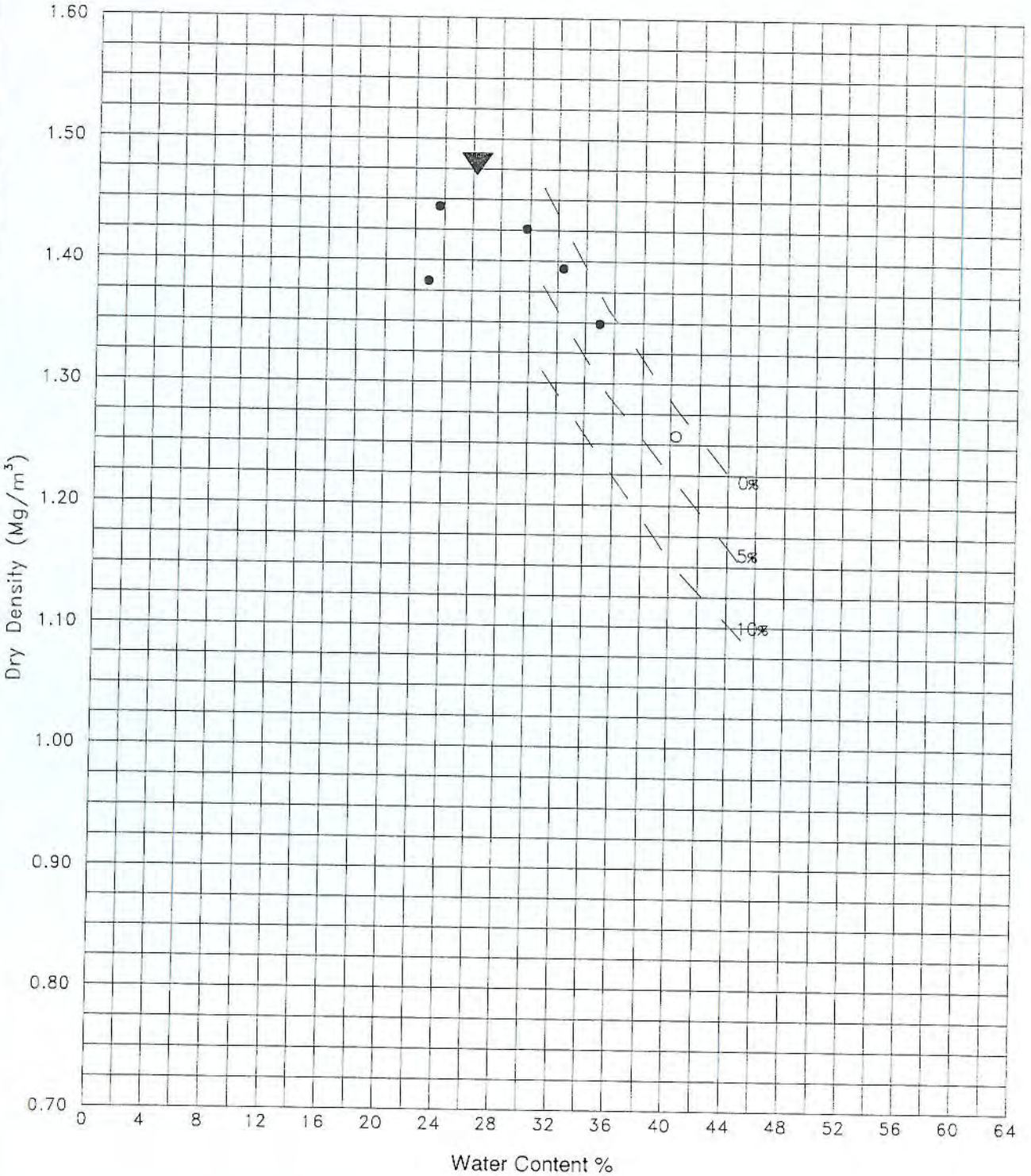
GEOTECH

Project
N6 Galway City Outer Bypass Contract 1
Ground Investigation Menlough to Garraun North
Galway County Council

Contract KC3209

Sheet 1

BH/TP	Depth	w%	Direct Shear Top (kpa)	Remoulded Shear Top (kpa)	Direct Shear Bottom (kpa)	Remoulded Shear Bottom (kpa)
TP151	0.10 - 0.40	40	16	4	22	8
TP164	0.20 - 0.30	27	27	6	25	9
TP164	0.20 - 0.30	25	42	14	63	18
TP164	0.20 - 0.30	23	59	30	62	20
TP164	0.20 - 0.30	20	124	18	106	46
TP164	0.20 - 0.30	16	84	16	104	16
TP169	0.50 - 0.80	39	20	22	21	14
TP169	0.50 - 0.80	33	54	18	54	20
TP169	0.50 - 0.80	27	np	np	np	np
TP169	0.50 - 0.80	21	92	22	108	18
TP169	0.50 - 0.80	18	130	22	128	24
TP209	0.50 - 0.80	11	31	12	28	11
TP209	0.50 - 0.80	12	26	11	24	11
TP209	0.50 - 0.80	14	22	10	30	16
TP209	0.50 - 0.80	16	20	4	24	4
TP209	0.50 - 0.80	17	9	5	8	6
TP217	0.65	10	>146	30	68	44
TP217	0.65	6.1	np	np	np	np
TP217	0.65	12	np	np	np	np
TP217	0.65	11	np	np	np	np
TP217	0.65	14	np	np	np	np
TP224	0.70	11	25	20	33	18
TP224	0.70	9.1	130	23	138	16
TP224	0.70	5.7	np	np	np	np
TP224	0.70	3.6	np	np	np	np
TP224	0.70	13	16	9	18	10
TP225	0.70	19	91	16	78	42
TP225	0.70	18	>146	24	>146	46
TP225	0.70	14	>146	24	>146	24
TP225	0.70	12	np	np	np	np
TP225	0.70	24	32	10	30	14
TP225A	0.20 - 0.40	27	32	12	39	12
TP225A	0.20 - 0.40	25	28	13	32	14
TP225A	0.20 - 0.40	21	98	30	96	27
TP225A	0.20 - 0.40	18	np	np	np	np
TP225A	0.20 - 0.40	13	86	40	77	25
TP228	1.80	11	5	4	5	4
TP228	1.80	8.7	30	24	32	20
TP228	1.80	4.6	np	np	np	np
TP228	1.80	7.9	10	8	13	7
TP228	1.80	9.5	12	12	14	10

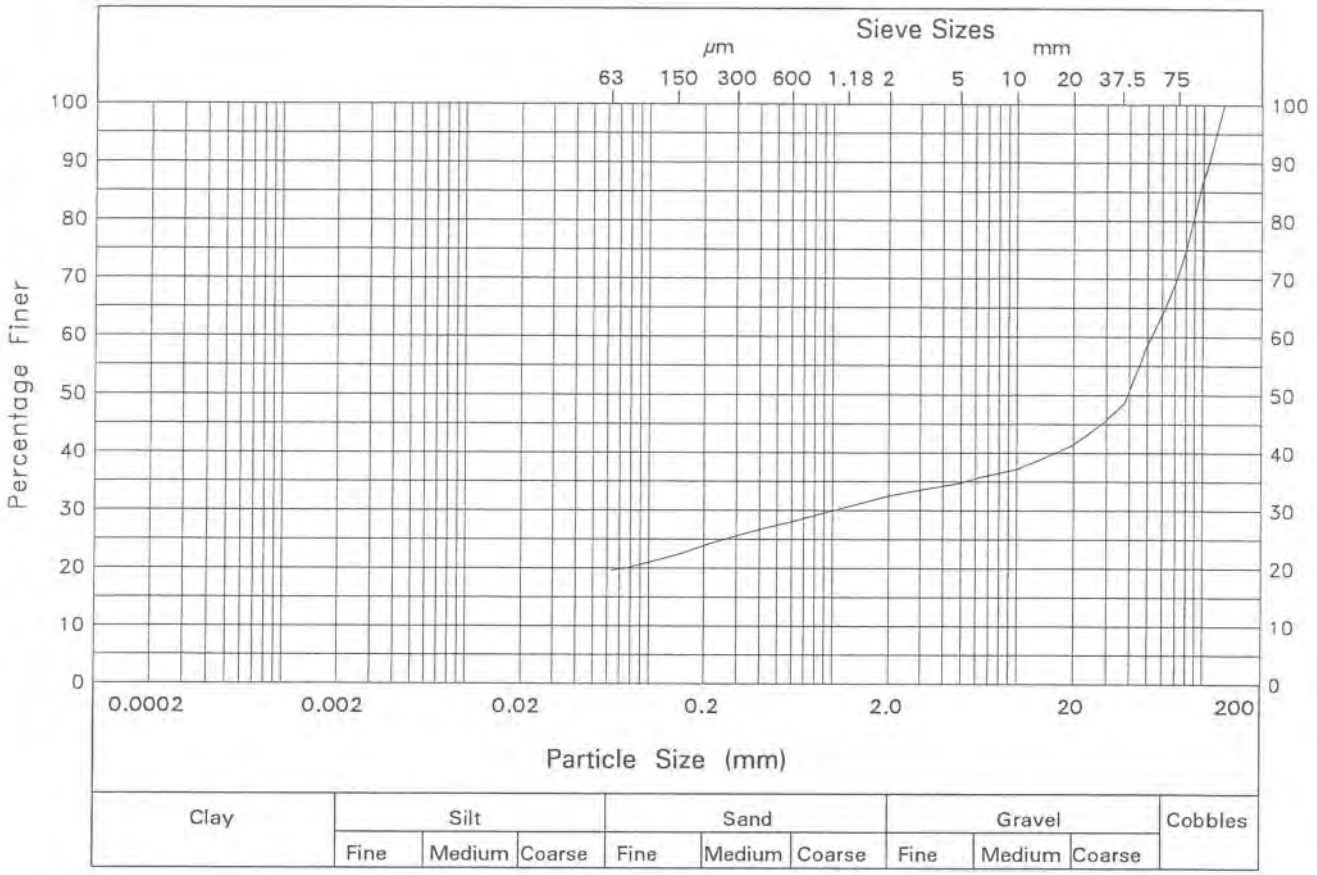


- ● Moisture Content/Dry Density
- ○ Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content

Type of Test/Mould	2.5Kg/CBR	Description	Hole TP151
Particle Density Assumed	2.65 Mg/m³		
Maximum Dry Density	1.47 Mg/m³	Slightly sandy gravelly CLAY	Depth 0.10 -0.40
Optimum Water Content	26 %		
% retained 37.5mm sieve	2		Type B
% retained 20mm sieve	12		Form 54/0

Remarks

Laboratory - Moisture Content/ Dry Density Relationship	**Project** N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North Galway County Council	**Contract** KC3209
GEOTECH		

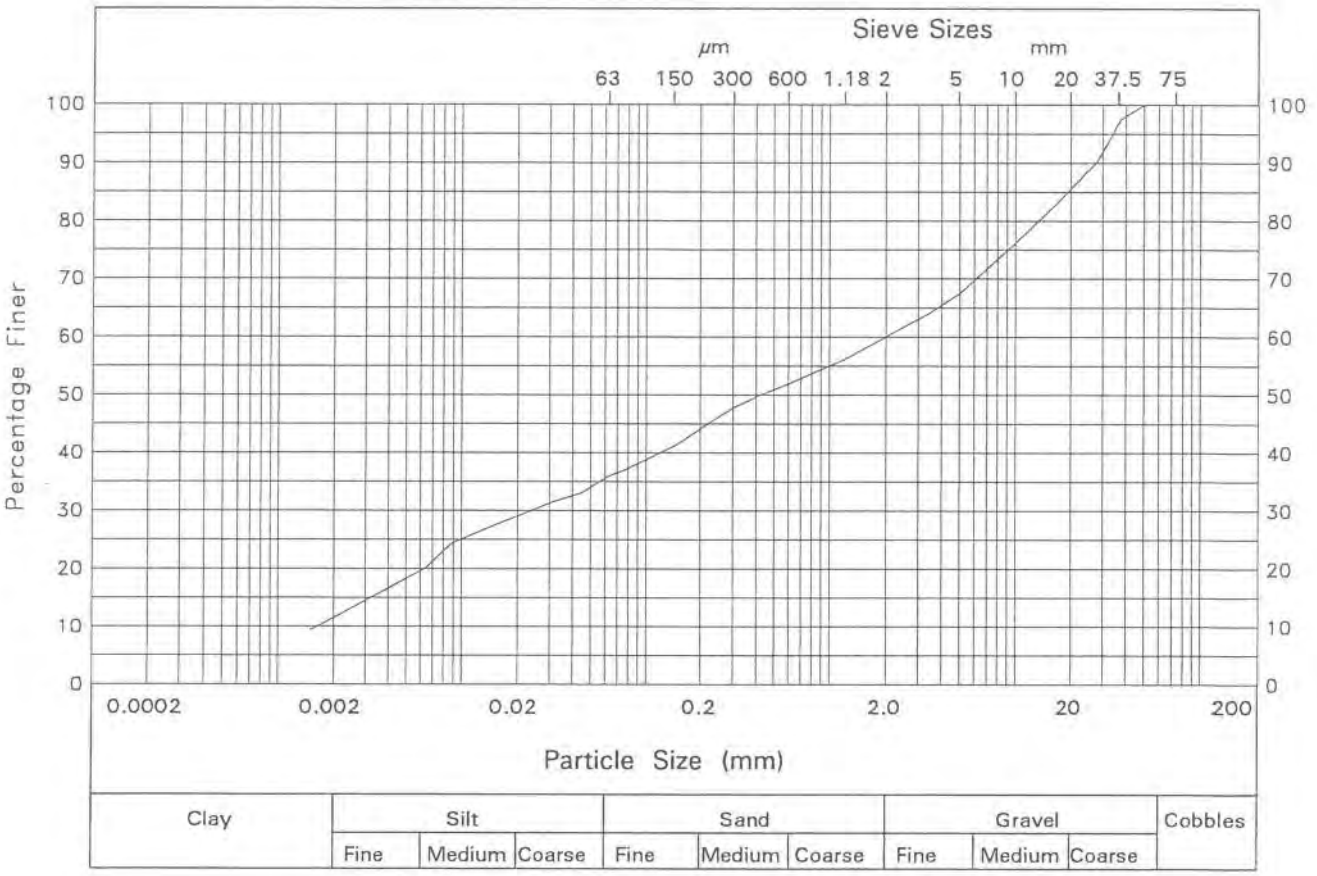


Particle Size	% Passing	Particle Size	% Passing
90 mm	81	2 mm	33
75 mm	72	1.18 mm	31
63 mm	65	600 μm	28
50 mm	59	425 μm	27
37.5 mm	49	300 μm	26
28 mm	45	212 μm	24
20 mm	41	150 μm	23
14 mm	39	75 μm	20
10 mm	37	63 μm	20
6.3 mm	36		
5 mm	35		
3.35 mm	34		

Hole TP149	Description Slightly sandy very gravelly SILT
Depth 0.50 -0.75	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North Galway County Council	**Contract** KC3209
GEOTECH		**Sheet**



Clay	Silt			Sand			Gravel			Cobbles
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	

Particle Size	% Passing	Particle Size	% Passing
50 mm	100	425 µm	50
37.5 mm	98	300 µm	48
28 mm	90	212 µm	45
20 mm	86	150 µm	41
14 mm	81	75 µm	37
10 mm	76	63 µm	36
6.3 mm	70	45 µm	33
5 mm	67	32 µm	32
3.35 mm	64	17 µm	28
2 mm	60		
1.18 mm	56		
600 µm	52		

Hole TP151	Description Slightly sandy gravelly SILT
Depth 0.10 -0.40	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North Galway County Council	**Contract** KC3209
GEOTECH		**Sheet**

Trial Pit Log

GEOTECH

Logged by DJB Checked by ROR	Start 16/10/2003 End 16/10/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.80 m Length 2.50 m 330 (Deg)	Ground Level +17.05 mOD Coordinates E 129594.42 National Grid N 228308.23

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.50	D 2	
0.50-0.75	B 3	
0.50-0.75	B 4	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 MADE GROUND: Soft to firm brown slightly sandy slightly gravelly CLAY with rare granite and brick fragments. Gravel is subangular to subrounded fine to coarse.	0.20 +16.85		
2 Stiff brown grey slightly sandy very gravelly SILT with many cobbles. Gravel is subangular to angular fine to coarse. Cobbles are subangular of limestone.	(0.55)		
EXPLORATORY HOLE ENDS AT 0.75 m 0.75 m Gravel and cobbles are angular.	0.75 +16.30		

Depth	Type & No.	Records Date

Groundwater Entries

No. Struck	Post Strike (m)	Behaviour
None observed (see Key Sheet)		

Depth Related Remarks

From	to (m)	
0.75		Trial pit terminated due to obstruction - limestone bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (296), 22/01/2004 12:19:12 AGS

Project N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North

Project No. KC3209

Carried out for Galway County Council

Trial Pit

TP149

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 10/11/2003 End 10/11/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.90 m Length 3.00 m 98 (Deg)	Ground Level +24.87 mOD Coordinates E 129788.90 National Grid N 228546.61

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.10-0.40	B 3	
0.10-0.40	B 4	
0.30	D 2	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy CLAY with many roots. Gravel is subangular.	0.10 *+24.77*		
2 Firm to stiff brown slightly sandy gravelly SILT with occasional cobbles. Gravel is subangular fine to coarse. Cobbles are subangular of limestone.	(0.30) 0.40 *+24.47*		
EXPLORATORY HOLE ENDS AT 0.40 m			

Groundwater Entries	Depth Related Remarks	
No. Struck (m) Post Strike Behaviour None observed (see Key Sheet)	From to (m) 0.40 Trial pit terminated due to obstruction - possible limestone bedrock.	Stability Good Shoring None Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBill (206), 22/01/2004 12:19:17 AGS

Project	N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North
Project No.	KC3209
Carried out for	Galway County Council

Trial Pit **TP151**

Trial Pit Log

GEOTECH

Logged by DJB Checked by ROR	Start 17/10/2003 End 17/10/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.80 m Length 3.50 m 340 (Deg)	Ground Level +9.63 mOD Coordinates E 131193.46 National Grid N 228785.96

Samples and Tests

Depth	Type & No.	Date Records
0.50	HV	p 65 kPa, r 0 kPa
1.00	D 1	
1.00-1.50	B 2	
1.00-1.50	B 3	
2.00	D 4	
2.00-2.50	B 5	
2.00-2.50	B 6	

Strata

Description	Depth, Level (Thickness)
1 Spongy dark brown black slightly sandy pseudofibrous PEAT with occasional tree remains. (0.50 m Hand vane 65, 60, 70kPa, average 65kPa)	(3.00) 3.00 +6.63
2 Firm grey slightly sandy gravelly CLAY. Gravel is subangular fine to coarse.	3.10 +6.53

EXPLORATORY HOLE ENDS AT 3.10 m

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.00	Fast inflow

Depth Related Remarks

From	to (m)	
3.10	-	Trial pit terminated at maximum depth.

Stability: Poor below 2.00m

Shoring: None

Weather:

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBII (298) 22/01/2004 12:24:52 AGS

Project: N6 Galway City Outer Bypass Contract 1 Ground Investigation Menlough to Garraun North

Project No. KC3209

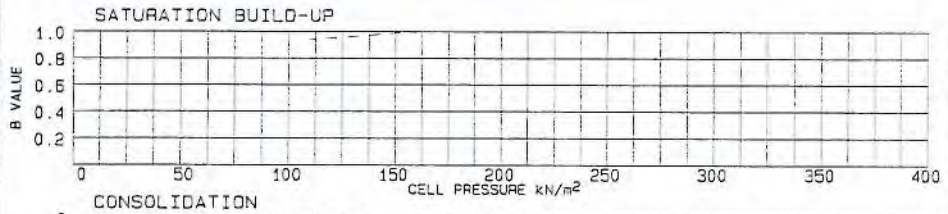
Carried out for: Galway County Council

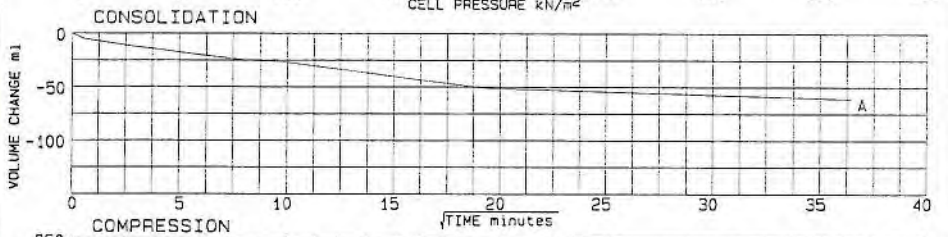
Trial Pit **TP215**

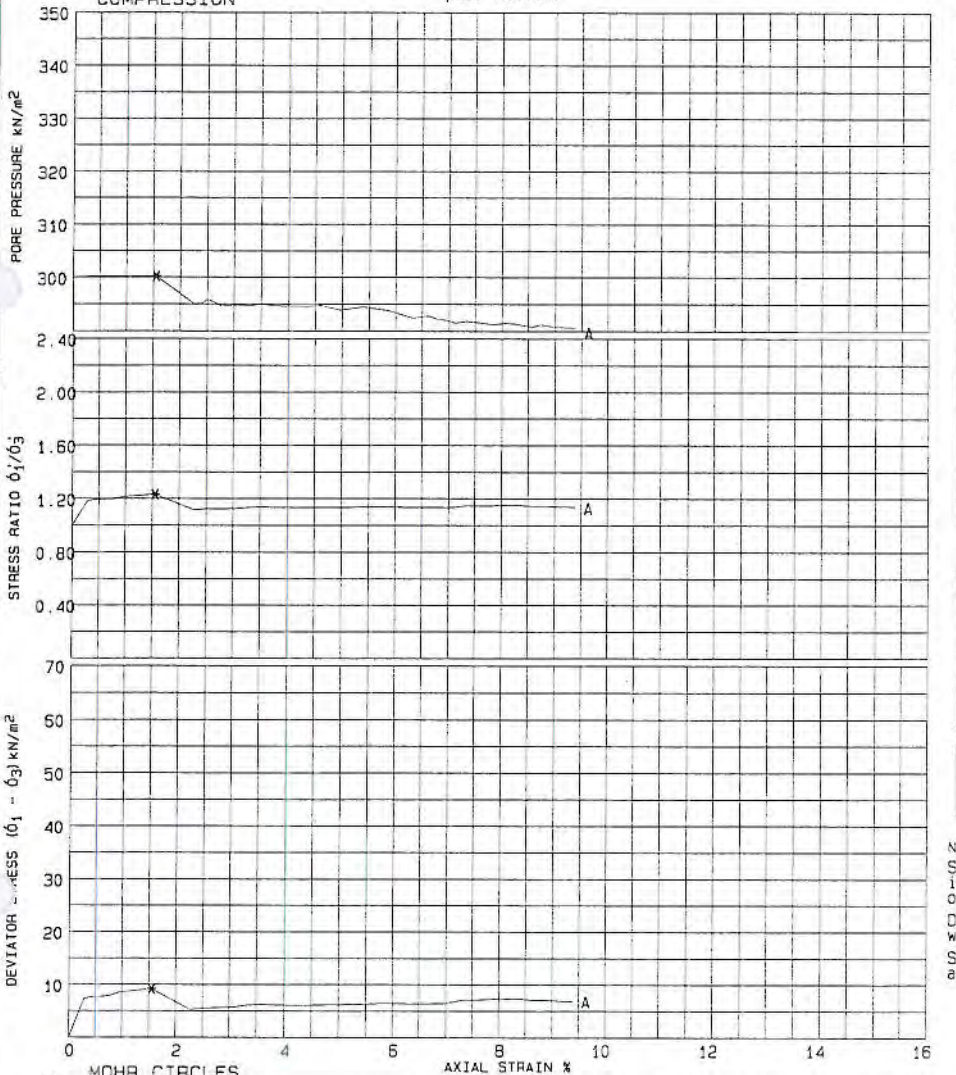
Sheet 1 of 1

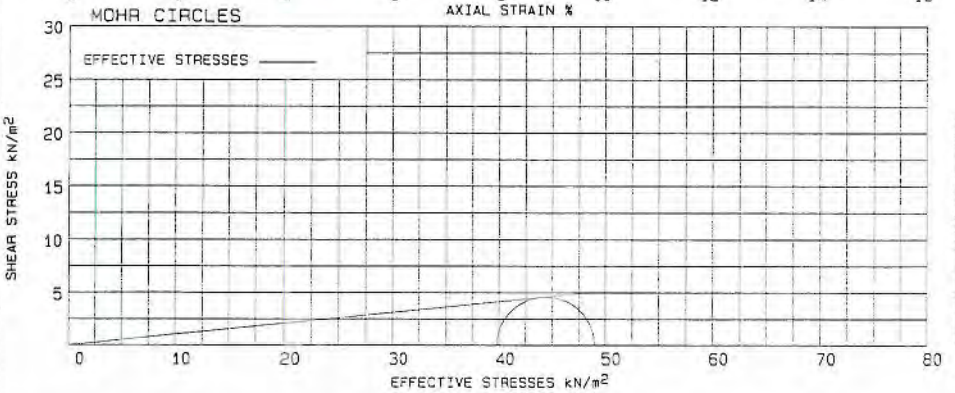
Appendix A.9.1.1.2

N6 Galway City Outer Bypass Contract 2 Gortatleva to Menlough – September to December 2003









SPECIMEN			A	B	C
INITIAL	Density Mg/m³		1.19		
	Moisture %		182		
	Dry Density Mg/m³		0.42		
AFTER CONSOLIDATION	Density Mg/m³		1.17		
	Moisture %		166		
	Dry Density Mg/m³		0.44		
SATURATION STAGE	Initial pwp	kN/m²	4		
	Saturated pwp		207		
	Final cell pressure		210		
	B value		1.00		
CONSOLIDATION STAGE	Cell Pressure	kN/m²	340		
	Back Pressure		300		
	Initial pwp		330		
	Final pwp		300		
	σ3'		40		
	pwp dissipation %		100		
COMPRESSION STAGE	Cell Pressure	kN/m²	340		
	Initial pwp		300		
	Inital σ3'		40		
	Rate of strain % per hour		0.42		
FAILURE CONDITIONS AT PEAK DEVIATOR STRESS	Axial Strain %		1.6		
	(σ1 - σ3)f	kN/m²	9		
	uf		300		
	σ3'f		40		
	σ1'f		49		
	Af		0.02		
	(σ1' / σ3')		1.230		
	MODE OF FAILURE				

SHEAR STRENGTH PARAMETERS C' ASSUMED ZERO	C'	Ø'
	0 kN/m²	6°

NOTES

Saturation by application of cell/back pressure increments of 50 kN/m2 with a differential of 10 kN/m2.

Drainage during consolidation to top with Vertical side drains fitted

Stress/strain curves corrected for area change, side drains and .33 mm thick membrane

SOIL DESCRIPTION

Soft brownish grey organic CLAY with fine rootlets and plant remains.

TYPE OF SPECIMEN: UNDISTURBED

SPECIMEN DIMENSIONS: 97.7 mm dia x 192.5 mm long

Test carried out to BS 1377 : Part 8 : 1990 : Test 7

Consolidated Undrained Triaxial Compression Test with measurement of Pore Pressure

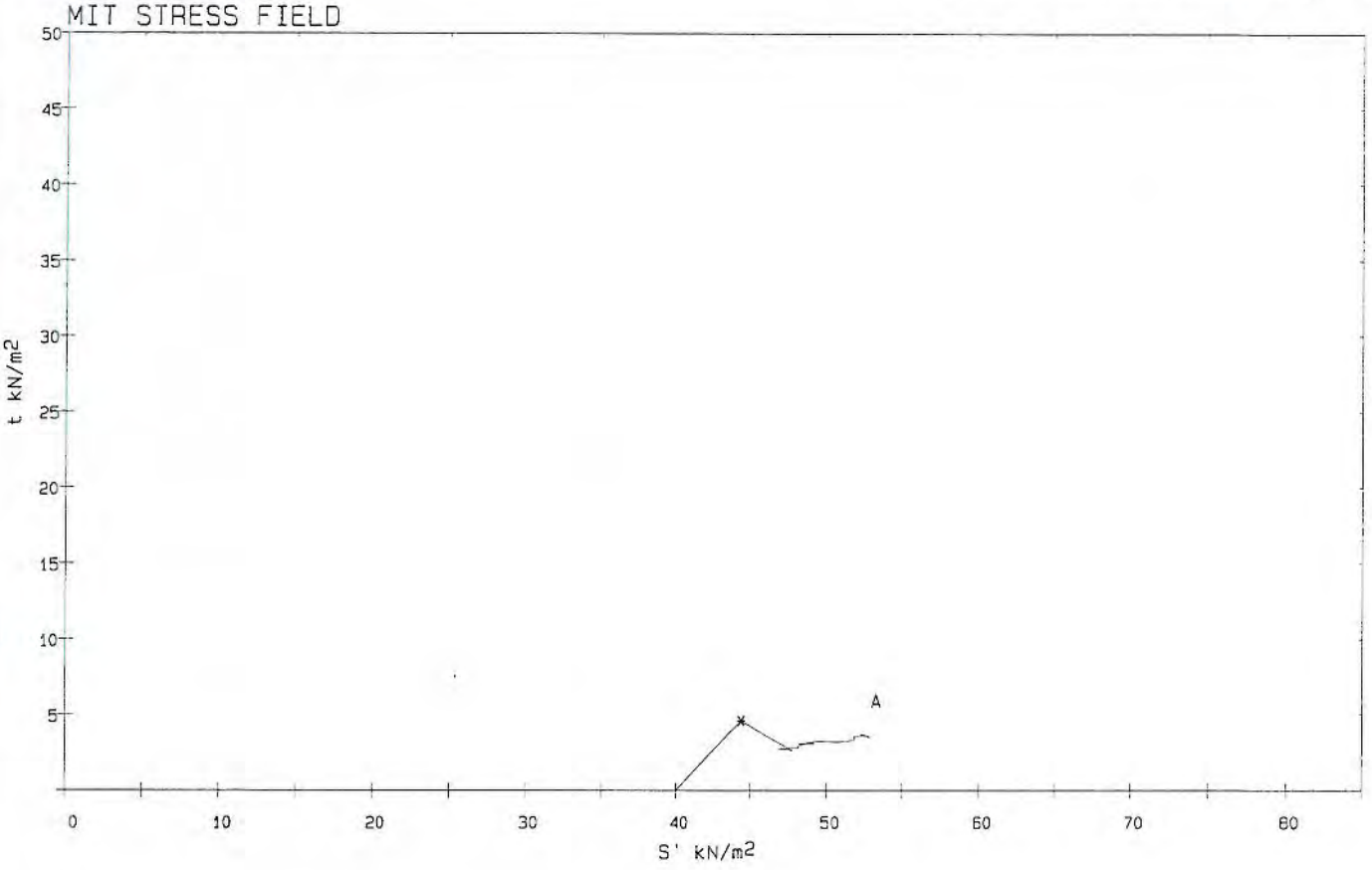
Borehole No. 110 Depth 3.50-4.50m

Sample No. P11

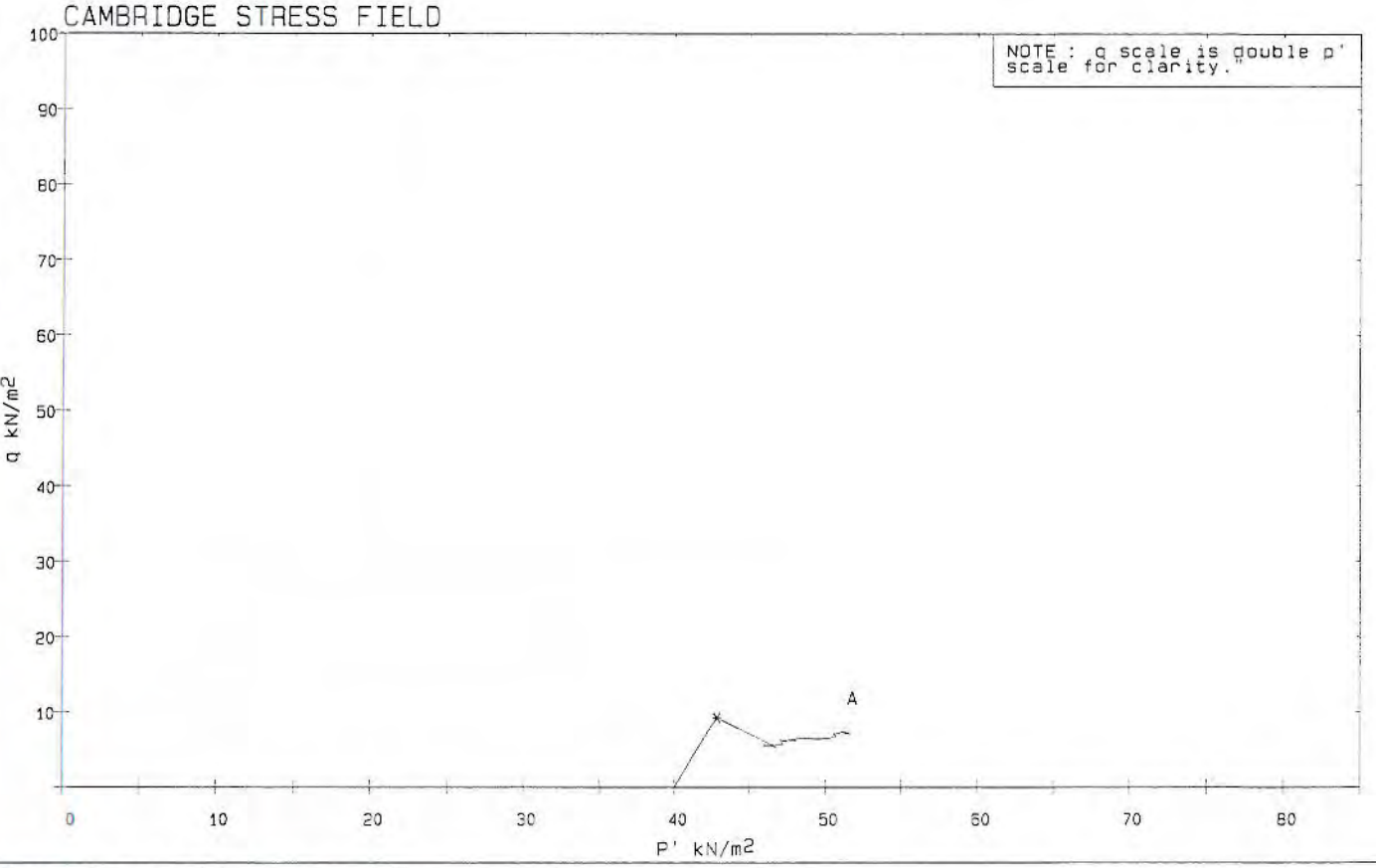
SLR 8.7A	Soil Mechanics	Location: N6 GALWAY CITY OUTER BYPASS	Loc. No.: KC3210	Fig.

NOTE : Tested at rate of strain based on pore pressure equalisation at failure only.

MIT STRESS FIELD



CAMBRIDGE STRESS FIELD



Consolidated Undrained Triaxial Compression Test with measurement of Pore Pressure

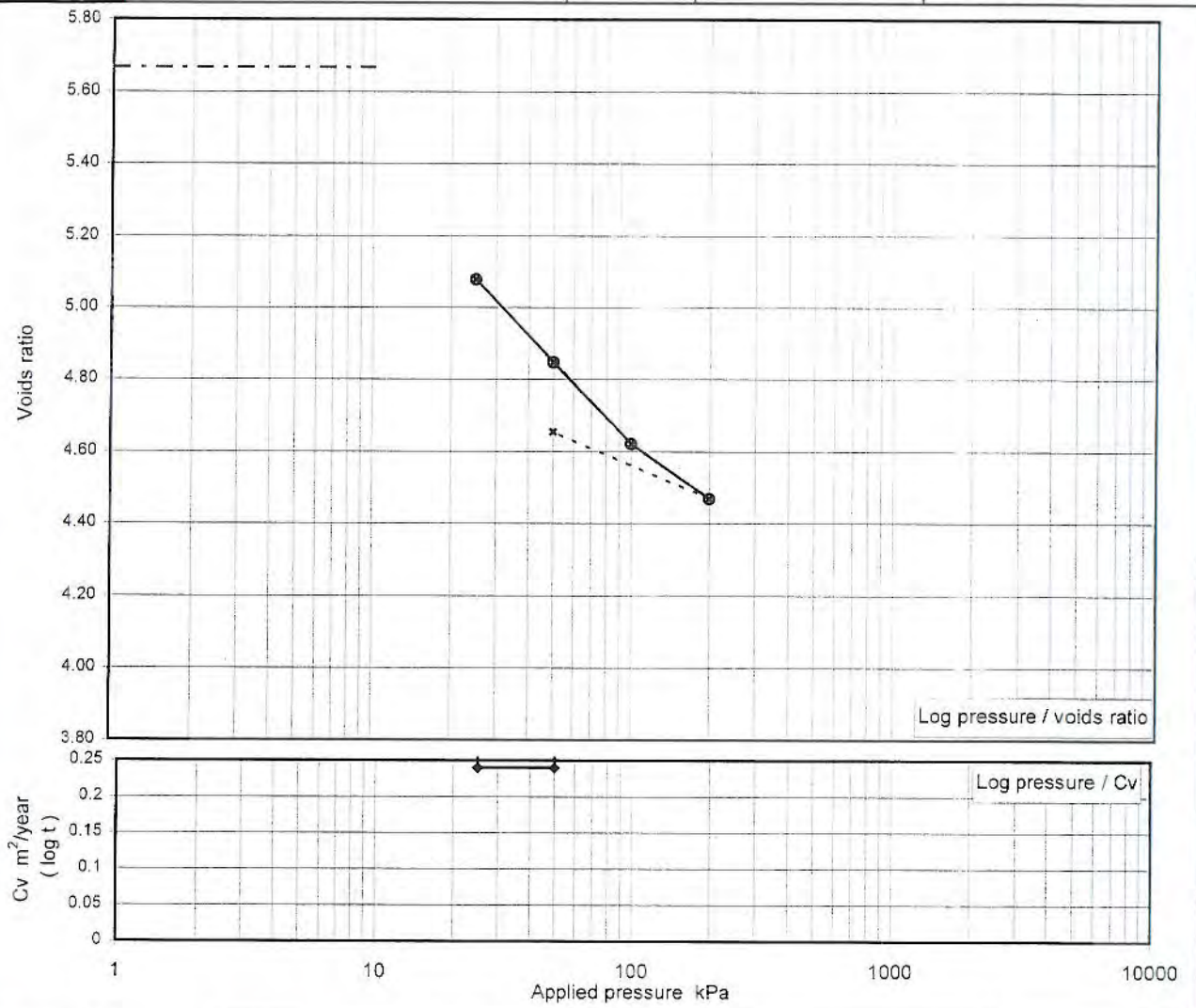
Borehole No. 110 Depth 3.50-4.50m

Sample No. P11

SLR 8.7B	Soil Mechanics	Location	N6 GALWAY CITY OUTER BYPASS	Loc. No. KC3210	Fig.

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	KC3210	Sample Details:	Hole No	BH110
Project Name	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough		Depth (m BGL)	3.5
			No	11
			Type	P
			ID	ESGN500077149



Soil description: Soft brownish grey organic CLAY with fine rootlets and plant remains.

Preparation: Undisturbed

Liquid limit %

Plastic limit %

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m³
Diameter	74.88		mm
Height	18.85	15.99	mm
Voids ratio	5.668	4.655	
Moisture content	216	96	%
Bulk density	1.26	0.92	Mg/m³
Dry density	0.40	0.47	Mg/m³
Saturation	101	54	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

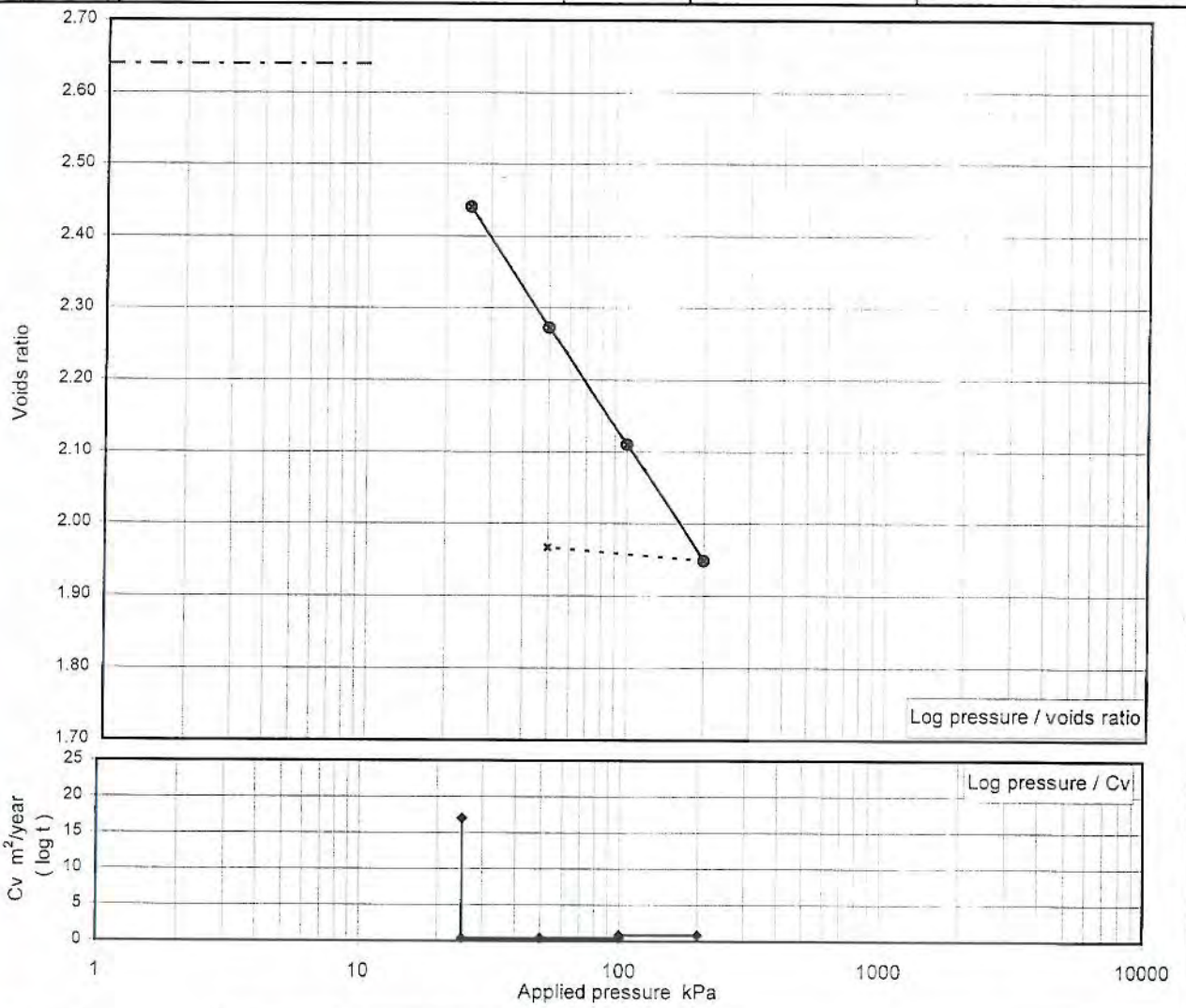
Notes :

Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50,\ log}$) m²/year	C_v ($t_{90,\ root}$) m²/year	
0	5.6680				
25	5.0783	3.537	0.46	0.49	
50	4.8473	1.520	0.24	0.23	
100	4.6213	0.773	0.28	0.26	
200	4.4685	0.272	0.41	0.45	
50	4.6553	0.228	-	-	

Specimen taken 50 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	KC3210	Sample Details:	Hole No	BH110
Project Name	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough		Depth (m BGL)	6.5
			No	16
			Type	P
			ID	ESGN500077151



Soil description	Soft uncompact light grey slightly clayey SILT.	Liquid limit %	
Preparation	Undisturbed	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m³
Diameter	74.86		mm
Height	18.86	15.37	mm
Voids ratio	2.640	1.967	
Moisture content	106	52	%
Bulk density	1.50	1.36	Mg/m³
Dry density	0.73	0.89	Mg/m³
Saturation	107	70	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

Notes :

Specimen taken 50 mm from base of sample

Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	2.6401				
25	2.4407	2.191	17	0.81	
50	2.2726	1.954	0.42	0.48	
100	2.1102	0.993	0.44	0.53	
200	1.9484	0.520	0.85	0.88	
50	1.9667	0.041	-	-	

Ref			Approved for issue (authorised signatory)		Date 23.1.04
SLR 5.3 Rev. 1 DEC 01	Soil Mechanics	UKAS TESTING 1157			Report page 1 of 1

Samples				Earthworks												
Hole	Depth	Type	Description	CBR Top	CBR Base	CBR Top w%	CBR Base w%	CBR Surch kg.	γ_b Mg/m^3	Comp Type	w% (Opt) <Nat>	γ_d (max) Mg/m^3	ρ_s Mg/m^3	% ret 20/ 37.5 mm	MCV
TP22	1.50-2.00	B	Slightly sandy very gravelly CLAY							2.5kg	(9.5)	(2.14)	2.65	14/	
				8.4	13	10	9.6	13.6	2.27	2.5kg	<10>	2.06		7.0	
				16	20	7.9	8.1	13.6	2.23	2.5kg	8.0	2.06			
				0.7	0.6	10	12	13.6	2.27	2.5kg	11	2.05			
				2.3	2.0	10.0	10	13.6	2.33	2.5kg	10	2.12			
				3.0	3.1	9.6	10.0	13.6	2.34	2.5kg	9.8	2.13			
				0.4	0.3	14	14	13.6	2.46	2.5kg	14	2.17			
									2.32	MCV	9.0	2.13		21	10.9
									2.34	MCV	7.8	2.17		21	17.3
									2.25	MCV	11	2.02		21	5.4
									2.29	MCV	9.7	2.08		21	11.8
									2.34	MCV	8.6	2.16		21	11.6
TP23	1.00-1.50	B	Slightly sandy to sandy gravelly CLAY							2.5kg	(10)	(2.04)	2.65	9.1/	
				3.3	4.4	11	11	13.6	2.25	2.5kg	<11>	2.02		3.9	
				23	21	8.8	10	13.6	2.21	2.5kg	9.6	2.02			
				28	37	5.6	5.0	13.6	2.02	2.5kg	5.3	1.92			
				0.3	0.2	13	12	13.6	2.21	2.5kg	12	1.97			
				0.1	0.1	15	15	13.6	2.19	2.5kg	15	1.91			
									2.28	MCV	9.9	2.08		13	9.0
									2.32	MCV	9.0	2.13		13	12.4
									2.16	MCV	6.1	2.04		13	13.4
									2.20	MCV	11	1.98		13	10.0
									2.20	MCV	14	1.93		13	1.4
TP96	0.50	B	Slightly sandy gravelly CLAY							2.5kg	(9.5)	(2.11)	2.65	10/	
				1.2	1.0	13	14	13.6	2.30	2.5kg	<13>	2.03		9.4	
				24	28	6.5	6.5	13.6	2.19	2.5kg	6.5	2.06			
				5.2	2.2	8.1	8.1	13.6	2.26	2.5kg	8.1	2.09			
				0.3	0.8	12	11	13.6	2.29	2.5kg	11	2.06			
				1.9	2.5	9.1	10	13.6	2.31	2.5kg	9.6	2.11			
									2.15	MCV	12	1.93		20	7.8
									2.25	MCV	7.7	2.09		20	14.0
									2.30	MCV	8.1	2.12		20	15.4
									2.16	MCV	12	1.93		20	2.0
									2.26	MCV	7.6	2.10		20	13.2
									2.25	MCV	7.8	2.09		20	12.0
TP113	1.40	B	Slightly sandy gravelly CLAY	0.3	0.3	8.9	9.4	13.6	2.36	2.5kg		2.16		16	
TP125	1.50-1.70	B	Very clayey SAND and GRAVEL							2.5kg	(7.5)	(2.19)	2.65	6.4/	
				7.5	13	8.1	9.5	13.6	2.34	2.5kg	<8.8>	2.15		3.6	
				45	56	5.4	5.4	13.6	2.28	2.5kg	5.4	2.17			
				0.5	0.6	9.6	9.7	13.6	2.34	2.5kg	9.7	2.14			
				0.1	0.2	11	10	13.6	2.30	2.5kg	11	2.08			
				21	27	5.6	6.7	13.6	2.31	2.5kg	6.1	2.18			
									2.38	MCV	8.1	2.20		10	11.2
									2.28	MCV	5.8	2.16		10	12.5
									2.35	MCV	7.8	2.18		10	4.0
									2.39	MCV	6.1	2.25		10	13.4
									2.30	MCV	9.9	2.09		10	1.0

Remarks

Form 6/2

Laboratory - Compaction, CBR & MCV Summary

Exploration Associates

Project
N6 Galway City Outer Bypass Contract 2
Ground Investigation Gortatleva to Menlough
Galway County Council

Contract KC3210

Sheet

Samples				Earthworks												
Hole	Depth	Type	Description	CBR Top	CBR Base	CBR Top w%	CBR Base w%	CBR Surch kg.	γ_b Mg/m^3	Comp Type	w% (Opt) <Nat>	γ_d (max) Mg/m^3	ρ_s Mg/m^3	% ret 20/ 37.5 mm	MCV
TP128	0.20-0.30	B	Slightly sandy gravelly CLAY							2.5kg	(14)	(1.88)	2.65	9.9/7.6	
				14	18	8.5	8.5	13.6	1.90	2.5kg	<8.5>	1.75			
				16	23	6.7	7.1	13.6	1.86	2.5kg	6.9	1.74			
				13	14	12	12	13.6	2.07	2.5kg	12	1.85			
				2.4	1.7	16	16	13.6	2.11	2.5kg	16	1.82			
				1.9	1.7	16	16	13.6	2.13	2.5kg	16	1.84			
									2.14	MCV	8.1	1.98		18	89.1
									2.10	MCV	11	1.89		18	12.6
									2.05	MCV	15	1.78		18	8.8
									2.10	MCV	14	1.83		18	10.0
									1.99	MCV	7.3	1.85		18	18.2
TP134	0.50-0.80	B	Clayey sandy GRAVEL							2.5kg	(20)	(1.67)	2.65	12/58	
				0.6	0.5	26	26	13.6	1.90	2.5kg	<26>	1.51			
				3.9	4.9	21	21	13.6	2.00	2.5kg	21	1.65			
				6.1	12	19	19	13.6	1.95	2.5kg	19	1.64			
				14	14	19	19	13.6	1.97	2.5kg	19	1.65			
				10	12	16	16	13.6	1.79	2.5kg	16	1.54			
									2.17	MCV	11	1.95		69	5.1
									1.95	MCV	21	1.60		69	10.2
									1.99	MCV	19	1.67		69	11.6
									2.01	MCV	19	1.69		69	13.8
TP142	1.00-1.40	B	Slightly sandy very gravelly SILT							2.5kg	(13)	(1.91)	2.65	11/37	
				0.8	0.6	18	18	13.6	2.10	2.5kg	<18>	1.77			
				9.9	7.2	13	13	13.6	2.15	2.5kg	13	1.90			
				16	24	9.7	9.7	13.6	2.06	2.5kg	9.7	1.88			
				34	34	6.1	7.3	13.6	1.98	2.5kg	6.7	1.86			
				17	14	12	10	13.6	1.98	2.5kg	11	1.78			
									2.11	MCV	13	1.86		48	11.2
									2.17	MCV	10	1.97		48	15.2
									2.16	MCV	11	1.94		48	11.4
									2.10	MCV	14	1.84		48	7.8

Remarks

Form 6/2

Laboratory - Compaction, CBR & MCV Summary	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

BH/TP	Depth	w%	Direct Shear Top (kpa)	Remoulded Shear Top (kpa)	Direct Shear Bottom (kpa)	Remoulded Shear Bottom (kpa)
TP11	0.10-0.40	19	6	4	8	2
TP11	0.10-0.40	17	12	6	14	7
TP11	0.10-0.40	14	36	18	34	12
TP11	0.10-0.40	9.5	NP	NP	41	16
TP11	0.10-0.40	8.4	NP	NP	NP	NP
TP15	0.70-0.80	9.7	116	46	140	8
TP15	0.70-0.80	7.8	240	8	290	12
TP15	0.70-0.80	11	12	4	40	16
TP15	0.70-0.80	13	4	0	4	0
TP15	0.70-0.80	7.5	210	28	224	32
TP20	1.50-2.00	11	38	2	30	4
TP20	1.50-2.00	9.1	236	44	156	32
TP20	1.50-2.00	13	4	0	4	0
TP20	1.50-2.00	13	0	0	0	0
TP22	1.50-2.00	10	140	30	250	36
TP22	1.50-2.00	8	96	12	184	16
TP22	1.50-2.00	11	28	4	20	4
TP22	1.50-2.00	10	340	32	200	16
TP22	1.50-2.00	9.8	196	28	144	32
TP23	1.00-1.50	11	62	14	76	12
TP23	1.00-1.50	9.6	170	90	168	38
TP23	1.00-1.50	5.3	216	16	224	60
TP23	1.00-1.50	12	24	4	20	4
TP23	1.00-1.50	15	4	0	4	0
TP96	0.50	13	22	12	34	20
TP96	0.50	6.5	NP	NP	NP	NP
TP96	0.50	8.1	70	16	98	26
TP96	0.50	11	23	7	17	5
TP96	0.50	9.6	40	16	42	20
TP128	0.20-0.30	8.5	NP	NP	NP	NP
TP128	0.20-0.30	6.9	NP	NP	NP	NP
TP128	0.20-0.30	12	NP	NP	NP	NP
TP128	0.20-0.30	16	44	15	42	14
TP128	0.20-0.30	16	72	30	70	30
TP142	1.00-1.40	18	44	12	54	10
TP142	1.00-1.40	13	58	20	110	24
TP142	1.00-1.40	9.7	NP	NP	NP	NP
TP142	1.00-1.40	6.7	NP	NP	NP	NP
TP142	1.00-1.40	11	NP	NP	NP	NP

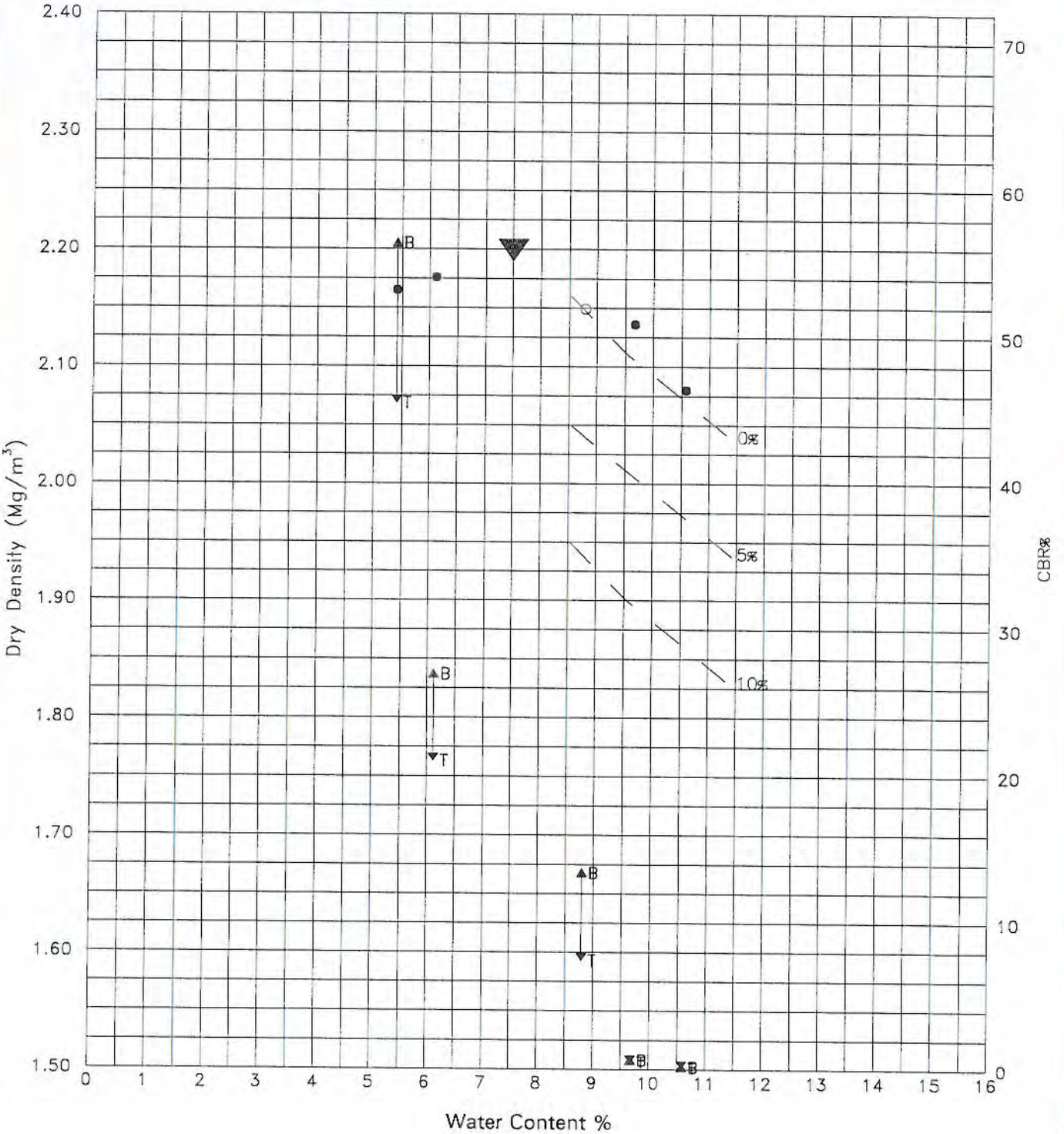
NP = No Penetration with hand vane

Hand Vanes In CBR Moulds

Project: N6 Galway City Outer Bypass
Contract 2 Ground Investigation
Gortatleva to Menalough

Contract 2
KC3210

GEOTECH



- Moisture Content/Dry Density
- Compaction at Natural Water Content
- Maximum Dry Density/Optimum Water Content
- CBR% Top
- CBR% Bottom
- CBR% Average (if Top and Bottom are within 10%)

Type of Test/Mould	2.5Kg/CBR	
Particle Density Assumed	2.65	Mg/m³
Maximum Dry Density	2.19	Mg/m³
Optimum Water Content	7.5	%
% retained 37.5mm sieve	4	
% retained 20mm sieve	6	

Description

Very clayey SAND and GRAVEL

Hole TP125

Depth 1.50 -1.70

Type B

Form 54/0

Remarks

Laboratory - Moisture Content/ Dry Density Relationship

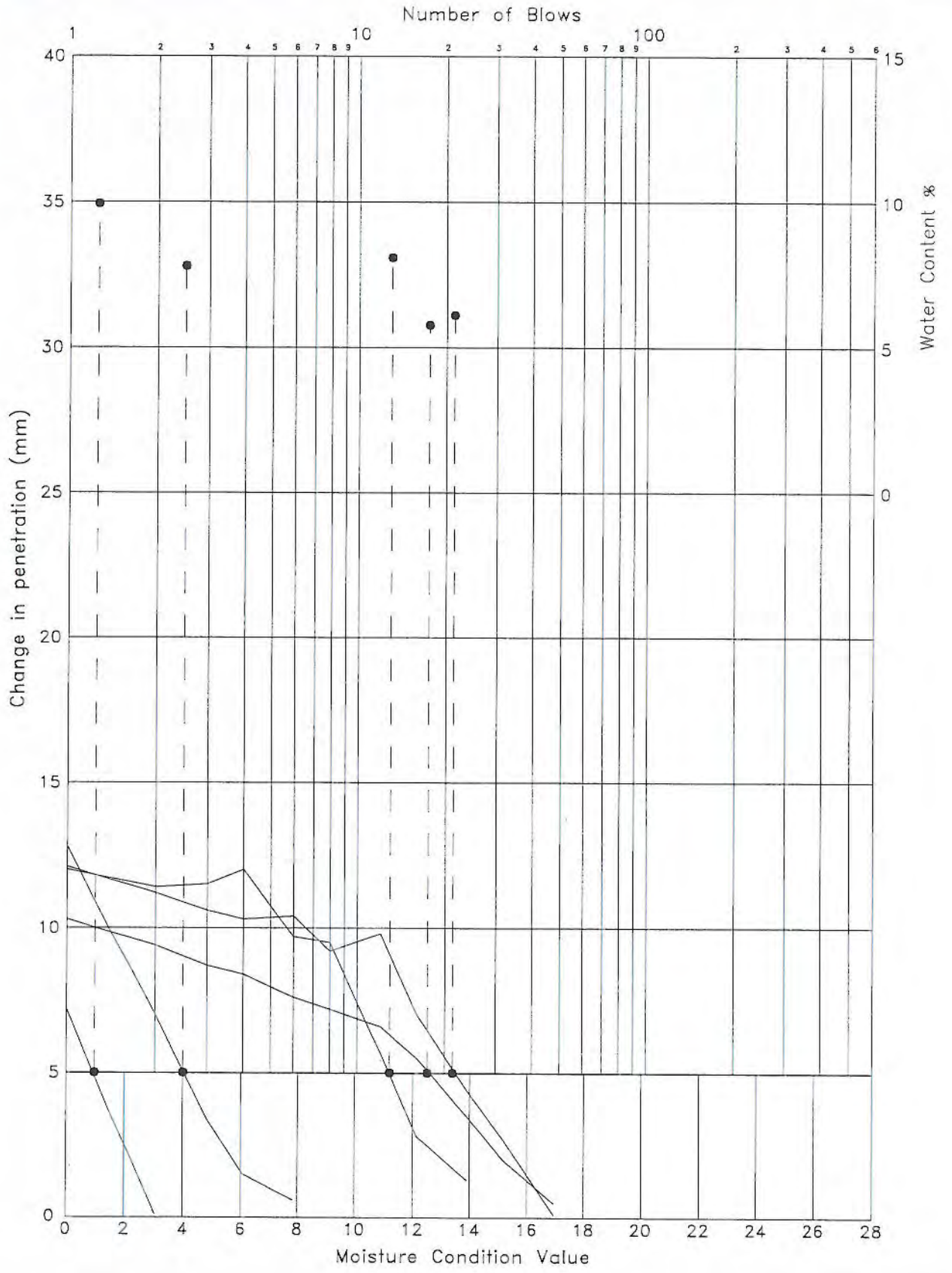
Exploration Associates

Project

N6 Galway City Outer Bypass Contract 2
Ground Investigation Gortatleva to Menlough
Galway County Council

Contract

KC3210

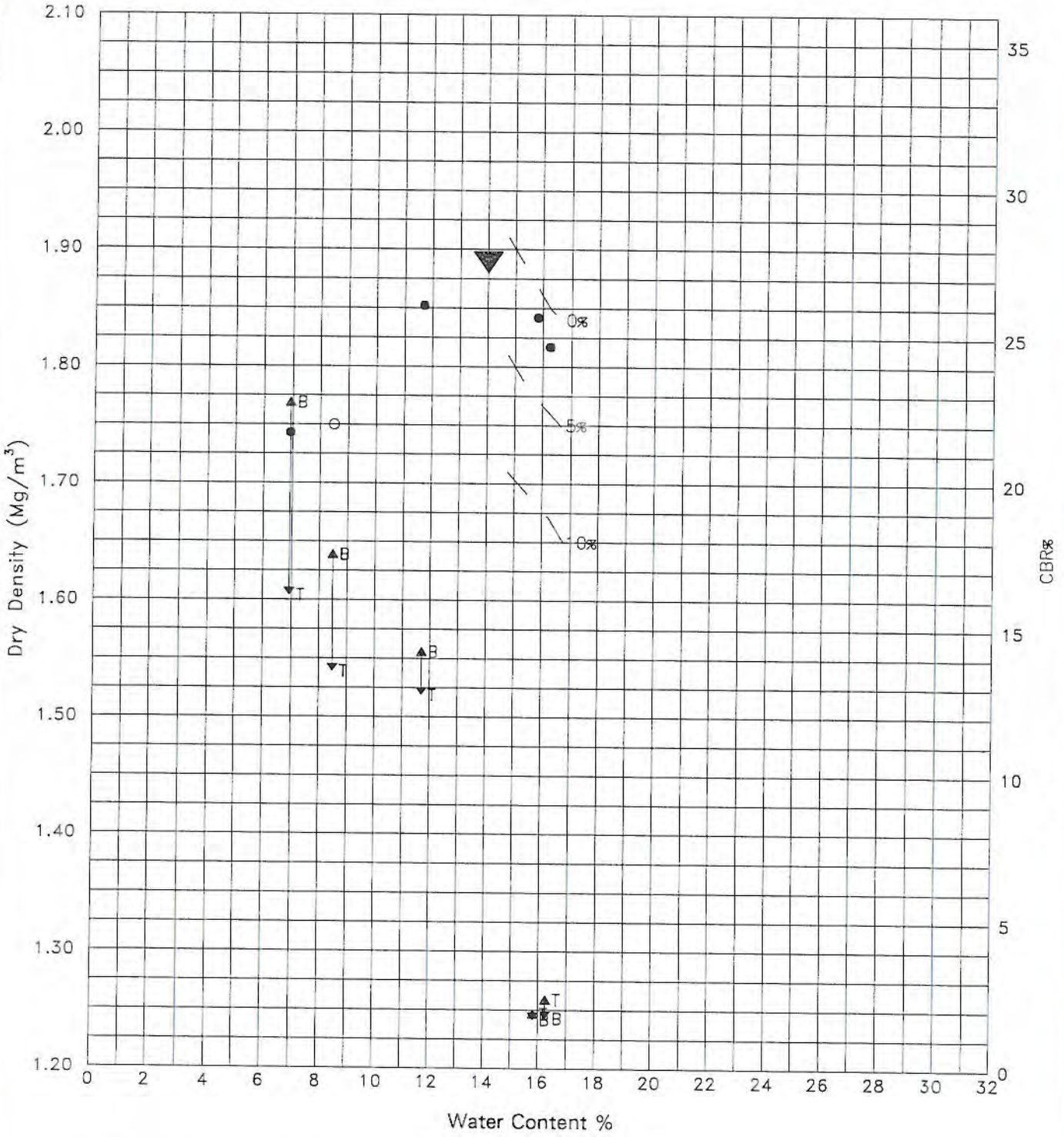


% retained on 20mm sieve 10	Description Very clayey SAND and GRAVEL	Hole TP125 Depth 1.50 -1.70 Type B

Remarks

Form 52/1

Laboratory - MCV Exploration Associates	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210



- ● Moisture Content/Dry Density
- o Compaction at Natural Water Content
- ▼ Maximum Dry Density/Optimum Water Content
- ▼ CBR% Top
- ▲ CBR% Bottom
- ▲ CBR% Average (if Top and Bottom are within 10%)

Type of Test/Mould	2.5Kg/CBR	Description	Hole TP128
Particle Density Assumed	2.65 Mg/m^3	Slightly sandy gravelly CLAY	Depth 0.20 -0.30
Maximum Dry Density	1.88 Mg/m^3		Type B
Optimum Water Content	14 %		
% retained 37.5mm sieve	8		
% retained 20mm sieve	10		

Form 54/0

Remarks

Laboratory - Moisture Content/ Dry Density Relationship

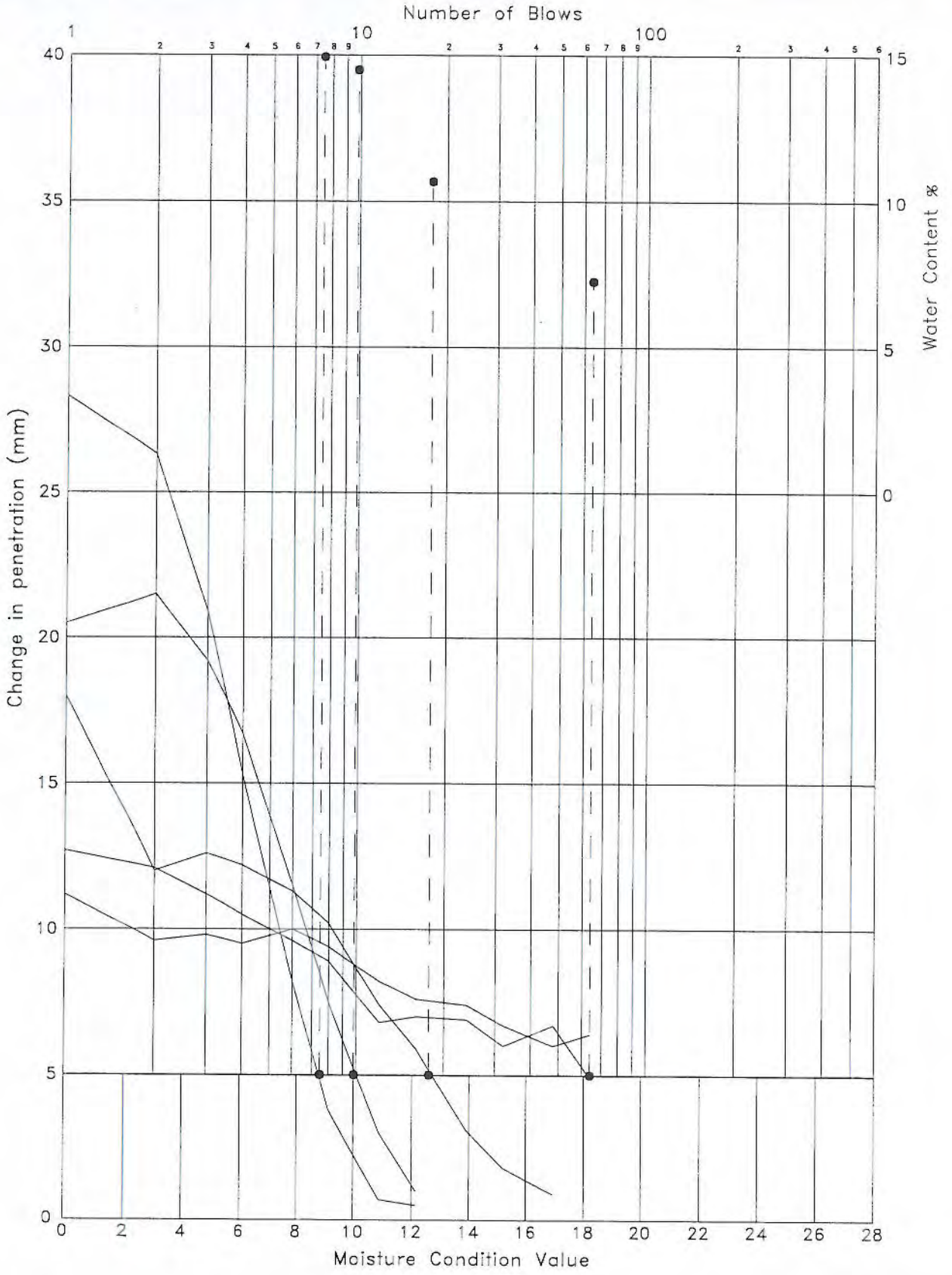
Exploration Associates

Project

N6 Galway City Outer Bypass Contract 2
Ground Investigation Gortatleva to Menlough
Galway County Council

Contract

KC3210

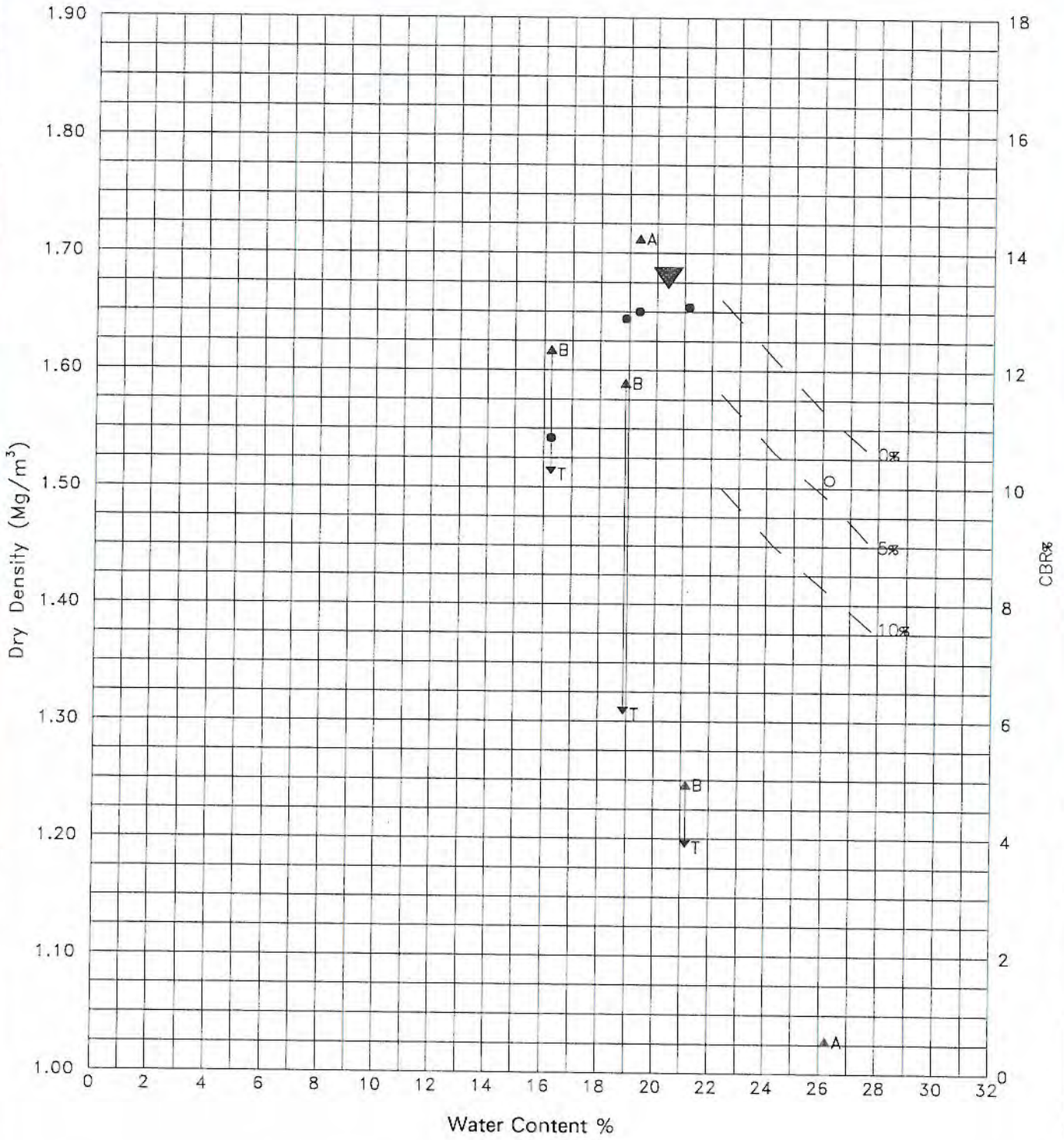


% retained on 20mm sieve 18	Description Slightly sandy gravelly CLAY	Hole TP128 Depth 0.20 -0.30 Type B

Remarks

Form 52/1

Laboratory - MCV Exploration Associates	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210

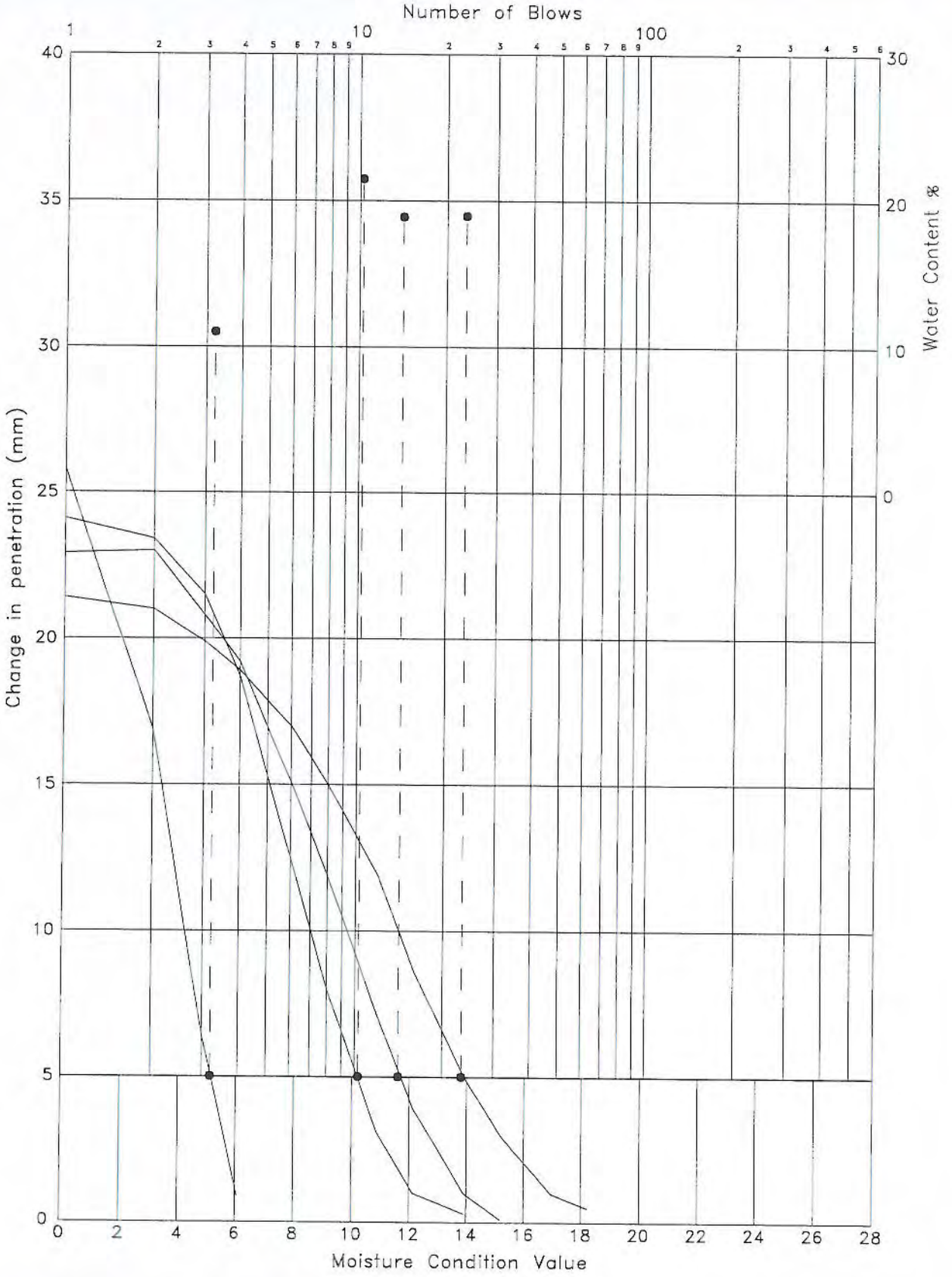


- Moisture Content/Dry Density
- Compaction at Natural Water Content
- Maximum Dry Density/Optimum Water Content
- ▼ CBR% Top
- ▲ CBR% Bottom
- ▲ CBR% Average (if Top and Bottom are within 10%)

Type of Test/Mould	2.5Kg/CBR	Description	Hole TP134
Particle Density Assumed	2.65 Mg/m³	Clayey sandy GRAVEL	Depth 0.50 -0.80
Maximum Dry Density	1.67 Mg/m³		Type B
Optimum Water Content	20 %		Form 54/0
% retained 37.5mm sieve	58		
% retained 20mm sieve	12		

Remarks

Laboratory - Moisture Content/ Dry Density Relationship	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		

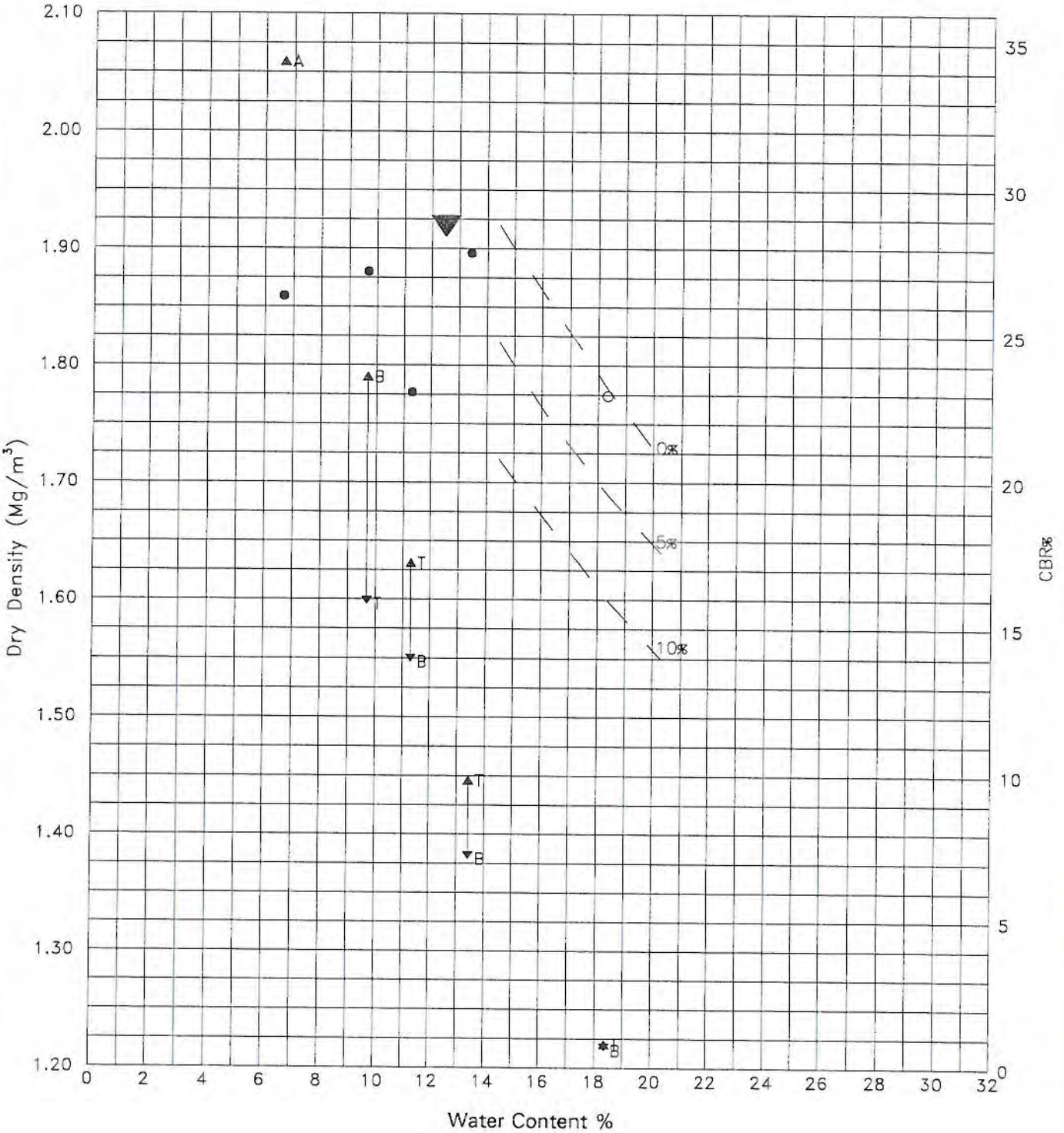


% retained on 20mm sieve 69	Description Clayey sandy GRAVEL	Hole TP134 Depth 0.50 -0.80 Type B

Remarks

Form 52/1

Laboratory - MCV Exploration Associates	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210



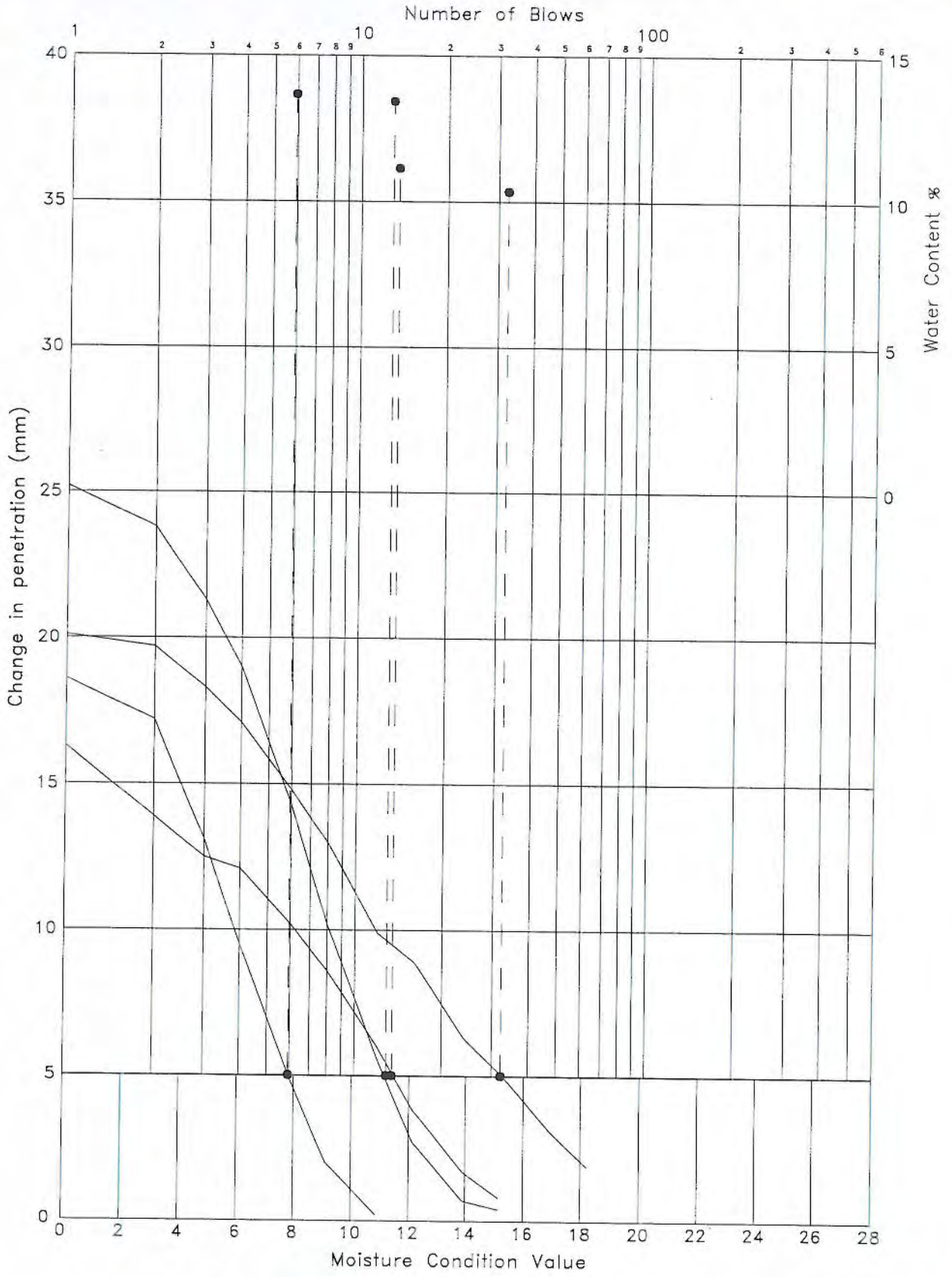
● Moisture Content/Dry Density
○ Compaction at Natural Water Content
▼ Maximum Dry Density/Optimum Water Content
▼ CBR% Top
▲ CBR% Bottom
▲ CBR% Average (if Top and Bottom are within 10%)

Type of Test/Mould	2.5Kg/CBR	Description	Hole TP142
Particle Density Assumed	2.65 Mg/m^3	Slightly sandy very gravelly SILT	Depth 1.00 -1.40
Maximum Dry Density	1.91 Mg/m^3		Type B
Optimum Water Content	13 %		
% retained 37.5mm sieve	37		
% retained 20mm sieve	11		

Form 54/0

Remarks

Laboratory - Moisture Content/ Dry Density Relationship	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		

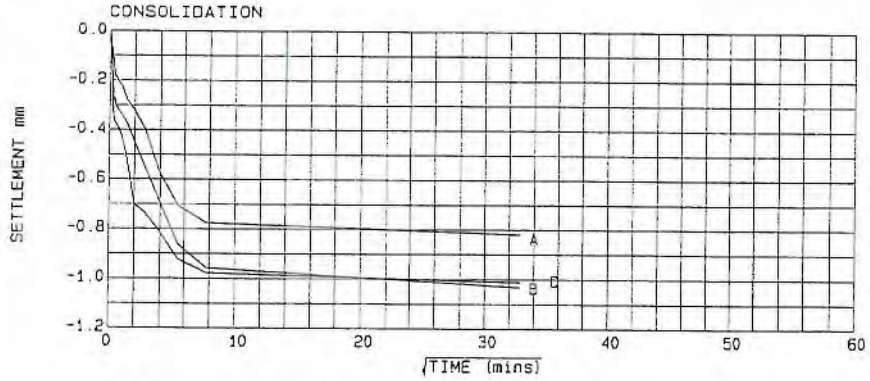


% retained on 20mm sieve 48	Description Slightly sandy very gravelly SILT	Hole TP142 Depth 1.00 -1.40 Type B

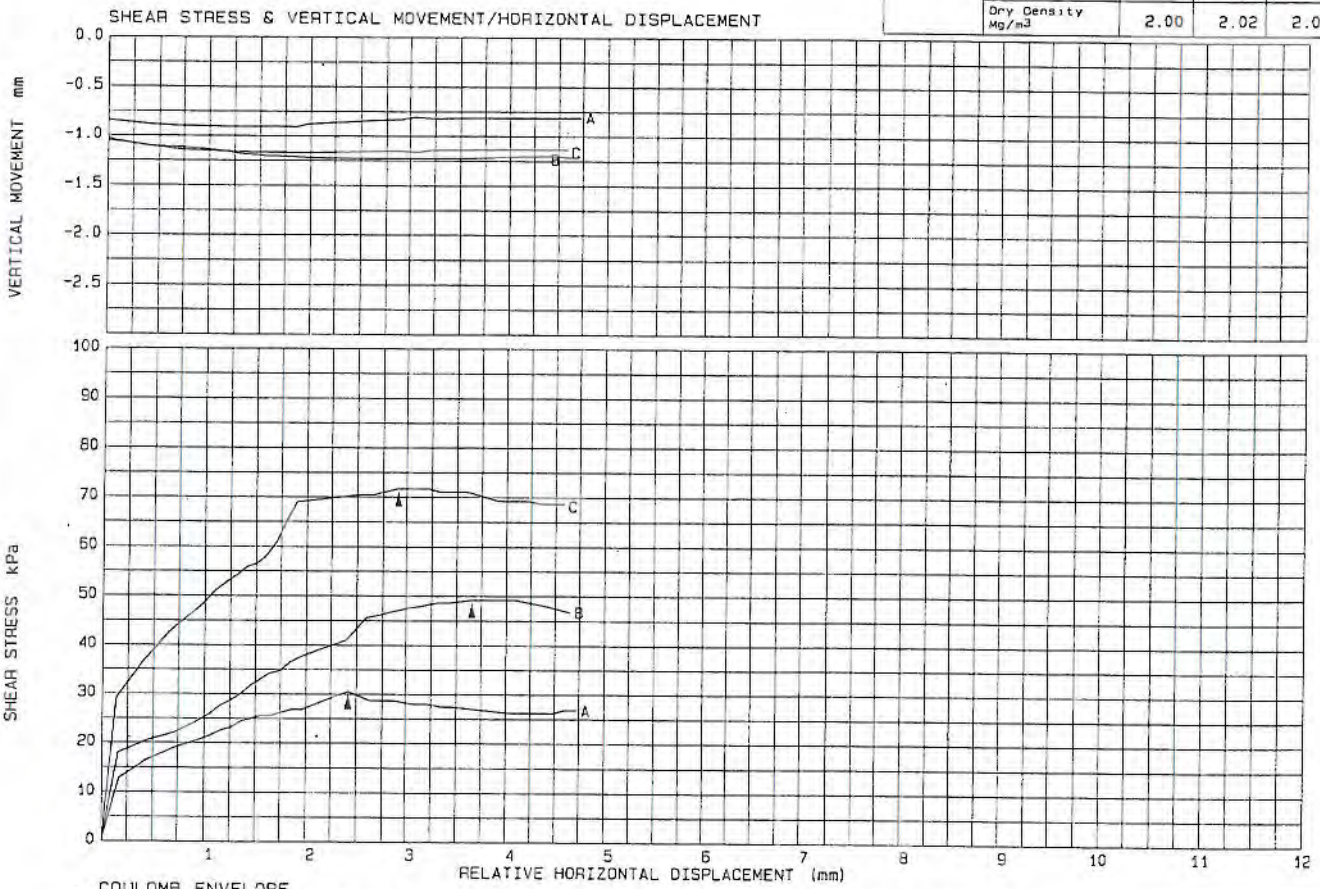
Remarks

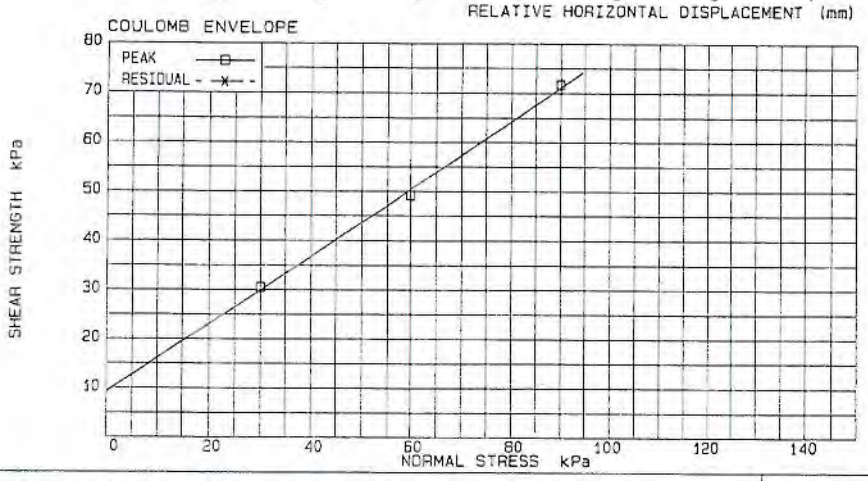
Form 52/1

Laboratory - MCV Exploration Associates	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210



SOIL DESCRIPTION	Grey gravelly CLAY.			
PREPARATION	-2mm material. Recompacted to equivalent of 2.5kg compactive effort at as received moisture content. Test carried out in submerged condition			
SPECIMEN		A	B	C
INITIAL	Bulk density Mg/m3	2.15	2.14	2.13
	Moisture %	11	11	11
	Dry density Mg/m3	1.93	1.92	1.91
Particle density 2.65 Mg/m3 assumed	Void Ratio	0.374	0.382	0.385
	Saturation %	80	79	78
AFTER TEST	Bulk density Mg/m3	2.00	2.02	2.01
	Moisture %	0.0	0.0	0.0
	Dry Density Mg/m3	2.00	2.02	2.01





CONSOLIDATION PRESSURE / NORMAL STRESS kPa		30	60	90	
RATES OF DISPLACE-MENT	Peak mm/min	0.0047	0.0047	0.0047	
	Post peak / Residual mm/min	0.0047	0.0047	0.0047	
PEAK VALUES	Relative Displacement mm	2.41	3.64	2.90	
	Shear Strength kPa	30.5	49.2	71.7	
RESIDUAL VALUES	Number of Reversals				
	Relative Displacement mm				
	Shear Strength kPa				
		Linear regression		Re-assessed	
SHEAR STRENGTH PARA-METERS PEAK	C'	9			kPa
	Ø'	34½			Degrees
RESIDUAL	C'R				kPa
	Ø'R				Degrees

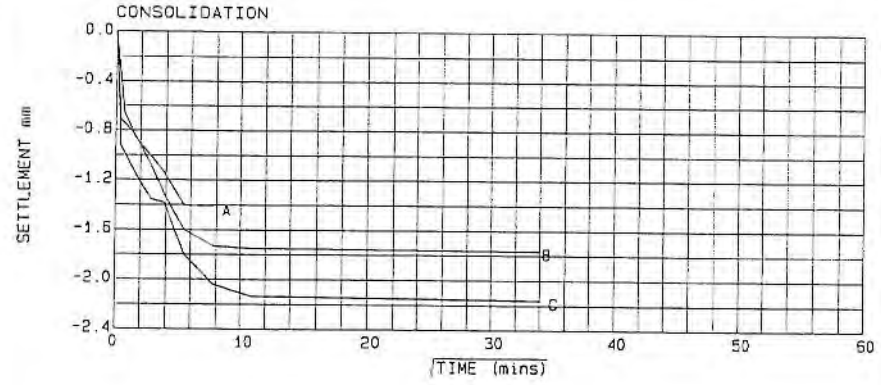
CONSOLIDATED DRAINED DIRECT SHEAR TEST

BS1377: Part 7: 1990, method 4 in 60mm square x 20mm deep box

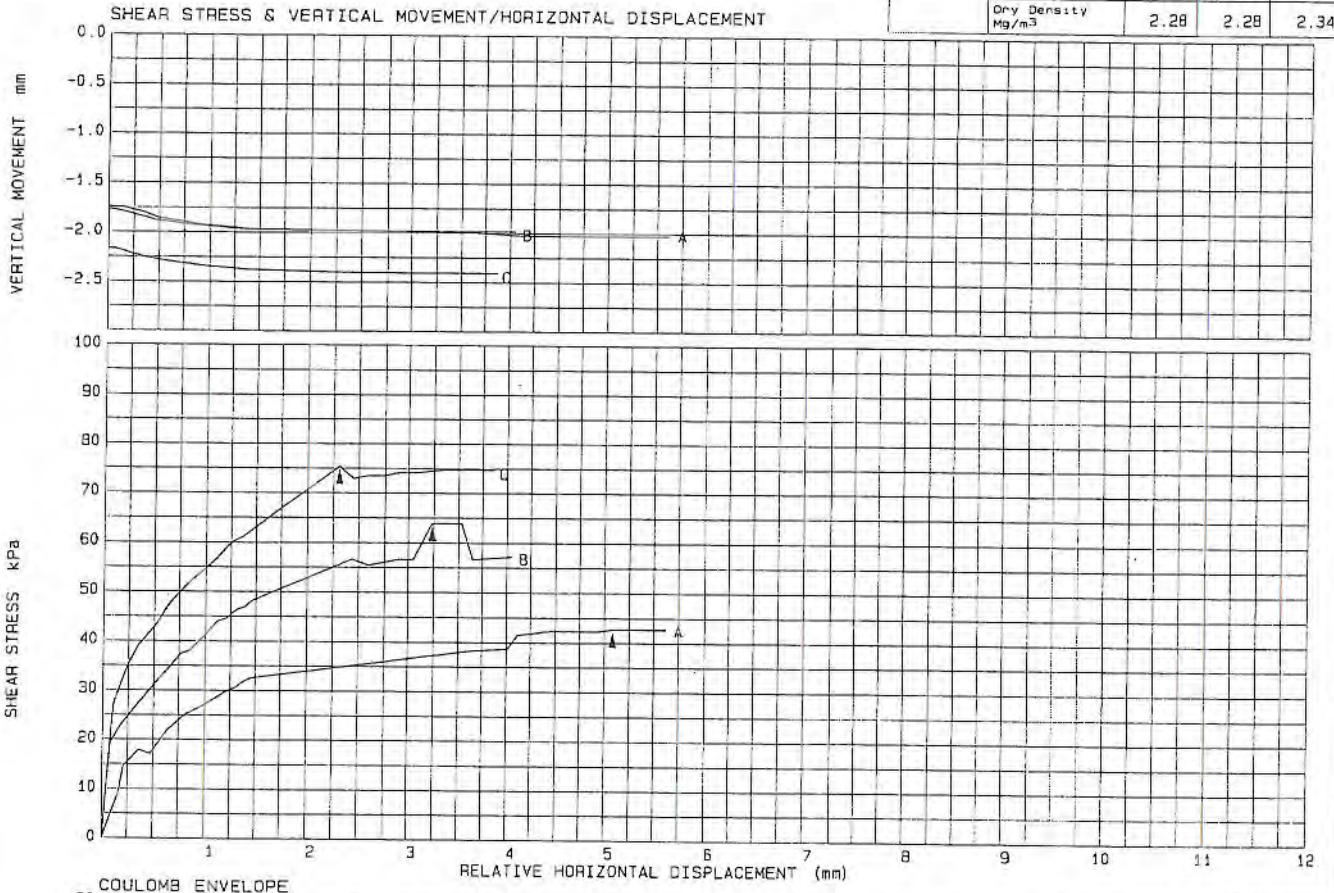
Borehole No. BH55A Depth 2.00m

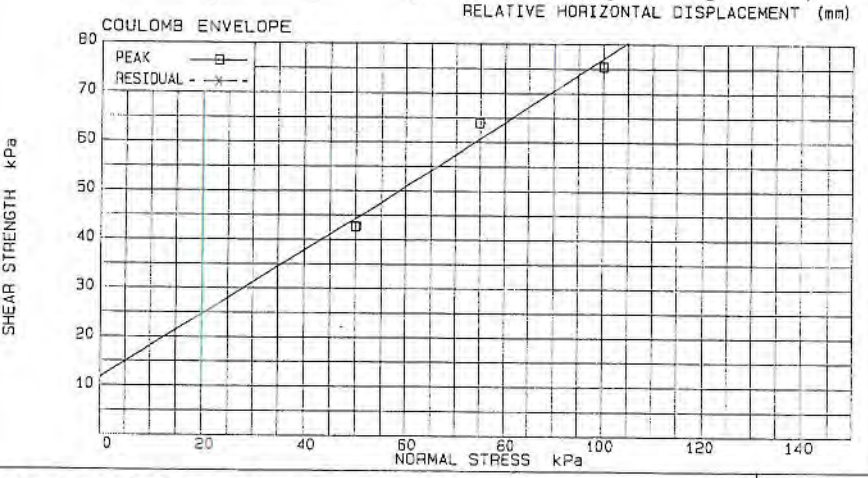
Sample No.

SLR 7.4	Soil Mechanics	Location N6 GALWAY	Loc. No. KC3210	Fig.



SOIL DESCRIPTION	Grey gravelly slighty sandy CLAY.			
PREPARATION	-2mm material. Recompacted to a dense state at as received moisture content. Test carried out in submerged condition			
SPECIMEN		A	B	C
INITIAL	Bulk density Mg/m³	2.31	2.32	2.33
	Moisture %	11	11	11
	Dry density Mg/m³	2.08	2.09	2.09
Particle density 2.65 Mg/m³ assumed	Void Ratio	0.273	0.269	0.267
	Saturation %	108	110	111
AFTER TEST	Bulk density Mg/m³	2.50	2.50	2.56
	Moisture %	9.6	9.6	9.6
	Dry Density Mg/m³	2.28	2.28	2.34





CONSOLIDATION PRESSURE / NORMAL STRESS kPa		50	75	100
RATES OF DISPLACE-MENT	Peak mm/min	0.0043	0.0043	0.0043
	Post peak / Residual mm/min	0.0043	0.0043	0.0043
PEAK VALUES	Relative Displacement mm	5.06	3.22	2.30
	Shear Strength kPa	42.7	63.9	75.4
RESIDUAL VALUES	Number of Reversals			
	Relative Displacement mm			
	Shear Strength kPa			
SHEAR STRENGTH PARA-METERS		Linear regression	Re-assessed	
	PEAK C'	12		kPa
	PEAK Ø'	33		Degrees
	RESIDUAL C'R			kPa
	RESIDUAL Ø'R			Degrees

CONSOLIDATED DRAINED DIRECT SHEAR TEST

BS1377: Part 7: 1990, method 4 in 60mm square x 20mm deep box

Trial Pit No. TP56 Depth 1.50m

Sample No.

SLR 7.4	Soil Mechanics	Location: GALWAY	Loc No. KC3210	Fig.

Point Load Test Data
Project: N6 Galway Bypass Contract 2
Project No.: KC3210

Borehole	Top Depth (mBGL)	Bottom Depth (mBGL)	Rock Description	Test Direction (PL/PD/R)	Core/Lump Diam/Width (mm)	Platen Separation D (initial) (mm)	D (failure) (mm)	Equiv Diam (mm)	Failure Loa (kN)	Is P/De^2 Mpa	Correction Factor $(De/50)^{0.45}$	Is50 **Is x F Mpa**	Remarks
Irregular Lump Tests													
RC6A	8.4	-	Granite	R	75	56	45	65.5	37	8.6	1.1	9.1	good fracture
RC6A	9.45	-	Granite	R	75	47	42	63.3	4	1.0	1.0	1.0	good fracture
RC7	3.05	-	Granite	R	75	45	38	60.2	7	1.9	1.0	1.8	good fracture
RC10	2.92	-	Granite	R	67	56	49	64.6	16.0	3.8	1.1	4.0	good fracture
RC10	6.62	-	Granite	PL	67	51	41	59.1	36.0	10.3	1.0	10.4	good fracture
RC17	14.90	-	Grey Limestone	R	69	30	22	44.0	2.3	1.2	0.8	0.9	good fracture
RC28	7.20	-	Grey Limestone	R	65	54	44	60.3	23.0	6.3	1.0	6.5	good fracture
RC101	9.36	-	Grey Limestone	PL	72	56	35	56.6	20.0	6.2	1.1	6.6	good fracture
RC122	3.20	-	Grey Limestone	R	65	48	38	56.1	24.0	7.6	1.0	7.5	good fracture
RC126	4.70	-	Grey Limestone	R	68	40	32	52.6	16.0	5.8	0.9	5.2	good fracture
RC140	4.40	-	Grey Limestone	R	68	52	42	60.3	19.0	5.2	1.0	5.3	good fracture
Axial Tests													
RC93	6.10	-	Grey Limestone	PD	63	95	84	82.1	22.0	3.3	1.3	4.4	good fracture
Diametric Tests													
RC5	2.33	-	Grey/pink Dolerite	R	75	75	58	74.4	12.0	2.2	1.2	2.6	shattered into several pieces
RC5	4.74	-	Pink Granite	PL	75	75	58	74.4	8.0	1.4	1.2	1.7	penetrative red stain on fracture
RC6A	3.80	-	Pink Granite	PL	75	68	59	75.1	25.0	4.4	1.1	5.1	good fracture
RC6A	9.43	-	Pink Granite	PD	75	75	70	81.8	1.0	0.1	1.2	0.2	along incipient fracture
RC10	4.90	-	Pink Granite	R	67	65	48	64.0	5.7	1.4	1.1	1.6	along incipient fracture
RC10	5.15	-	Pink Granite	R	67	67	61	72.1	10.0	1.9	1.1	2.2	good fracture
RC10	7.45	-	Pink Granite	R	67	66	53	67.2	6.0	1.3	1.1	1.5	good fracture
RC13	14.25	-	Grey Limestone	R	76	73	55	72.9	6.0	1.1	1.2	1.3	good fracture
RC13	16.68	-	Grey Limestone	R	76	76	54	72.3	18.0	3.4	1.2	4.2	good fracture
RC14A	10.60	-	Grey Limestone	R	76	76	62	77.5	2.9	0.5	1.2	0.6	follows calcite vein
RC14A	13.20	-	Grey Limestone	R	74	74	45	65.1	19.0	4.5	1.2	5.3	good fracture
RC16A	13.20	-	Grey Limestone	PL	74	74	55	72.0	9.0	1.7	1.2	2.1	good fracture
RC16A	17.03	-	Grey Limestone	R	75	75	58	74.4	8.0	1.4	1.2	1.7	along incipient fracture
RC17	8.95	-	Grey Limestone	R	69	69	45	62.9	23.0	5.8	1.2	6.7	chipped fracture
RC35	5.35	-	Grey Limestone	PL	75	74	61	76.3	26.0	4.5	1.2	5.3	good fracture
RC38	5.40	-	Grey Limestone	PL	75	74	63	77.6	29.0	4.8	1.2	5.8	good fracture
RC38	7.20	-	Grey Limestone	PL	75	74	57	73.8	32.0	5.9	1.2	7.0	good fracture

Point Load Test Data
Project: N6 Galway Bypass Contract 2
Project No.: KC3210

Borehole	Top Depth (mBGL)	Bottom Depth (mBGL)	Rock Description	Test Direction (PL/PD/R)	Core/Lump Diam/Width (mm)	Platen Separation D (initial) (mm)	D (failure) (mm)	Equiv Diam (mm)	Failure Loa (kN)	Is P/De^2 Mpa	Correction Factor $(De/50)^{0.45}$	Is50 Is x F Mpa	Remarks
Diametric Tests													
RC42	3.60	-	Grey Limestone	PL	75	73	54	71.8	28.0	5.4	1.2	6.4	good fracture
RC42	7.95	-	Grey Limestone	PL	75	74	69	81.2	28.0	4.3	1.2	5.1	good fracture
RC45	2.75	-	Grey Limestone	PL	75	71	62	76.9	20.0	3.4	1.2	4.0	good fracture
RC45	3.80	-	Grey Limestone	PL	75	72	62	76.9	28.0	4.7	1.2	5.6	good fracture
RC49	2.62	-	Grey Limestone	PL	75	74	62	76.9	19.0	3.2	1.2	3.8	good fracture
RC49	5.30	-	Grey Limestone	PL	75	75	56	73.1	23.0	4.3	1.2	5.2	good fracture
RC52	2.80	-	Grey Limestone	PL	75	73	62	76.9	27.0	4.6	1.2	5.4	good fracture
RC52	3.55	-	Grey Limestone	PL	75	74	64	78.2	31.0	5.1	1.2	6.1	good fracture
RC57	3.55	-	Grey Limestone	PL	75	75	63	77.6	30.0	5.0	1.2	6.0	good fracture
RC57	6.92	-	Grey Limestone	PL	76	75	65	79.3	24.0	3.8	1.2	4.6	good fracture
RC60	7.65	-	Grey Limestone	PL	75	74	57	73.8	24.0	4.4	1.2	5.3	good fracture
RC63	5.45	-	Grey Limestone	PL	75	73	59	75.1	31.0	5.5	1.2	6.5	good fracture
RC63	7.05	-	Grey Limestone	PL	75	74	63	77.6	33.0	5.5	1.2	6.5	good fracture
RC67	11.20	-	Grey Limestone	PL	75	75	66	79.4	28.0	4.4	1.2	5.3	good fracture
RC67	13.25	-	Grey Limestone	PL	76	76	64	78.7	25.0	4.0	1.2	4.9	good fracture
RC70	12.85	-	Grey Limestone	PL	75	75	64	78.2	40.0	6.5	1.2	7.9	good fracture
RC70	15.75	-	Grey Limestone	PL	76	76	61	76.8	24.0	4.1	1.2	4.9	chipped fracture
RC72	15.20	-	Grey Limestone	PL	75	74	62	76.9	25.0	4.2	1.2	5.0	good fracture
RC72	16.35	-	Grey Limestone	PL	75	74	55	72.5	34.0	6.5	1.2	7.7	good fracture
RC82	15.85	-	Grey Limestone	PL	74	74	63	77.0	20.0	3.4	1.2	4.0	good fracture
RC82	20.64	-	Grey Limestone	PL	74	74	65	78.3	19.0	3.1	1.2	3.7	chipped fracture
RC84	19.35	-	Grey Limestone	PL	75	75	62	76.9	28.0	4.7	1.2	5.7	chipped fracture
RC84	23.22	-	Grey Limestone	PL	75	75	60	75.7	21.0	3.7	1.2	4.4	chipped fracture
RC84D	10.65	-	Grey Limestone	R	73	73	58	73.4	27.2	5.0	1.2	6.0	chipped fracture
RC84D	12.24	-	Grey Limestone	PL	75	75	72	82.9	17.3	2.5	1.2	3.0	good fracture
RC87	2.95	-	Grey limestone	R	75	75	64	78.2	26.0	4.3	1.2	5.1	chipped fracture
RC87	4.70	-	Grey limestone	R	75	75	69	81.2	23.0	3.5	1.2	4.2	chipped fracture
RC87A	8.25	-	Grey limestone	PL	80	80	72	85.6	35.0	4.8	1.2	5.9	chipped fracture
RC87A	11.05	-	Grey limestone	PL	75	75	67.5	80.3	30.0	4.7	1.2	5.6	chipped fracture
RC88	2.70	-	Grey Limestone	PL	75	75	53	71.1	29.0	5.7	1.2	6.9	chipped fracture
RC88	4.07	-	Grey Limestone	PL	75	75	62	76.9	25.0	4.2	1.2	5.1	chipped fracture
RC89	2.30	-	Grey Limestone	PL	67	63	52	66.6	24.0	5.4	1.1	6.0	good fracture
RC89	4.22	-	Grey Limestone	PL	67	63	54	67.9	18.0	3.9	1.1	4.3	good fracture
RC89	4.70	-	Grey Limestone	PL	61	61	40	55.7	21.0	6.8	1.1	7.4	chipped fracture
RC91	6.80	-	Grey Limestone	R	62	62	43	58.3	13.5	4.0	1.1	4.4	chipped fracture
RC91	8.90	-	Grey Limestone	PL	62	62	47	60.9	16.0	4.3	1.1	4.8	good fracture
RC91A	12.00	-	Grey Limestone	R	75	75	51	69.8	23.0	4.7	1.2	5.7	chipped fracture
RC93	3.90	-	Grey Limestone	R	63	63	45	60.1	26.0	7.2	1.1	8.0	chipped fracture

Point Load Test Data
Project: N6 Galway Bypass Contract 2
Project No.: KC3210

Borehole	Top Depth (mBGL)	Bottom Depth (mBGL)	Rock Description	Test Direction (PL/PD/R)	Core/Lump Diam/Width (mm)	Platen Separation D (initial) (mm)	D (failure) (mm)	Equiv Diam (mm)	Failure Loa (kN)	Is P/De^2 Mpa	Correction Factor $(De/50)^{0.45}$	**Is50 Is x F Mpa**	Remarks
Diametric Tests													
RC97	3.70	-	Grey Limestone	PL	60	60	38	53.9	21.0	7.2	1.1	7.9	chipped fracture
RC97	9.40	-	Grey Limestone	PL	65	62	53	66.2	26.0	5.9	1.1	6.5	good fracture
RC99	2.43	-	Grey Limestone	PL	65	65	47	62.4	24.0	6.2	1.1	6.9	chipped fracture
RC99	3.34	-	Grey Limestone	PL	64	64	55	66.9	22.5	5.0	1.1	5.6	good fracture
RC99	6.20	-	Grey Limestone	PL	63	63	53	65.2	21.0	4.9	1.1	5.5	chipped fracture
RC101	8.15	-	Grey Limestone	R	72	72	42	62.0	28.0	7.3	1.2	8.6	chipped fracture
RC106	9.72	-	Grey Limestone	PL	65	64	54	66.8	18.0	4.0	1.1	4.5	good fracture
RC115	3.00	-	Grey Limestone	PL	65	64	54	66.8	27.0	6.0	1.1	6.8	good fracture
RC118	2.23	-	Grey Limestone	PL	64	64	52	65.1	29.0	6.8	1.1	7.6	good fracture
RC118	3.22	-	Grey Limestone	PL	64	64	50	63.8	27.0	6.6	1.1	7.4	chipped fracture
RC122	7.55	-	Grey Limestone	PL	65	64	56	68.1	23.0	5.0	1.1	5.5	good fracture
RC124	1.85	-	Grey Limestone	PL	66	66	45	61.5	24.0	6.3	1.1	7.2	chipped fracture
RC126	3.10	-	Grey Limestone	PL	68	68	58	70.9	17.0	3.4	1.1	3.9	good fracture
RC126	3.90	-	Grey Limestone	PL	68	68	56	69.6	18.0	3.7	1.1	4.3	good fracture
RC127	3.70	-	Grey Limestone	R	67	67	56	69.1	18.0	3.8	1.1	4.3	chipped fracture
RC135	2.35	-	Grey Limestone	PL	68	68	60	72.1	12.0	2.3	1.1	2.7	good fracture
RC135	6.50	-	Grey Limestone	PL	68	68	59	71.5	18.0	3.5	1.1	4.0	good fracture
RC135	6.72	-	Grey Limestone	PL	68	65	40	58.8	22.5	6.5	1.1	7.3	chipped fracture
RC138	2.50	-	Grey Limestone	PL	68	65	42	60.3	12.5	3.4	1.1	3.9	chipped fracture
RC138	3.00	-	Grey Limestone	PL	66	66	44	60.8	23.5	6.4	1.1	7.2	chipped fracture
RC140	3.60	-	Grey Limestone	PL	68	68	61	72.7	7.0	1.3	1.1	1.5	chipped fracture

Sample Details				Test Data								
Hole	Depth	Description	Length Dia. mm	Test Date	W %	γ_b Mg/m^3	Strain at Failure	Test Time secs	At 50% Stress: Secant Mod. E MN/m^2	At 50% Stress: Poiss. Ratio	UCS Value MPa	NOTES (Failure Mode, Orientation etc.)
RC6A	5.80-6.17		169.9 75.6	16/12/03	0.3 Nat	2.62		197			25.3	Axial Cleavage
RC10	7.75-8.65		121.5 67.4	09/02/04	0.5 Nat	2.64		294			49.4	Axial Cleavage
RC14A	11.7-12.04		159.0 75.5	30/01/04	0.3 Nat	2.70		393			46.3	Axial Cleavage
RC17	9.33-9.62		153.0 67.3	02/02/04	0.2 Nat	2.92		638			90.1	Axial cleavage
RC28	10.3-10.60		174.5 63.3	13/12/03	0.3 Nat	2.70		602			93.1	Axial Cleavage
RC35	5.88-6.15		150.7 75.1	05/02/04	0.2 Nat	2.70		777			81.6	Axial Cleavage
RC42	5.28-5.55		144.1 75.3	06/02/03	0.1 Nat	2.71		921			97.2	Axial Cleavage
RC45	4.00-4.50		154.7 74.3	05/02/04	0.2 Nat	2.72		959			96.1	Axial Cleavage
RC49	4.05-4.37		172.7 75.5	05/02/04	0.1 Nat	2.69		755			88.5	Axial Cleavage
RC52	3.75-4.15		150.1 75.5	06/02/04	0.1 Nat	2.70		818			91.9	Axial Cleavage
RC57	4.25-4.60		171.2 75.3	05/02/04	0.2 Nat	2.70		931			94.0	Axial Cleavage
RC60	6.25-6.70		181.1 74.8	05/02/04	0.1 Nat	2.71		568			62.7	Axial Cleavage
RC63	8.35-8.75		157.0 75.2	05/02/04	0.1 Nat	2.70		739			75.7	Axial Cleavage
RC67	13.8-14.10		169.3 75.4	05/02/04	0.2 Nat	2.70		584			61.1	Axial Cleavage

Remarks Tests performed and reported in accordance with ISRM (1981). Applied stress Rate 0.5 to 1 MPa/sec.
All testing performed along core axis unless otherwise stated in the notes.
Moisture condition (w%) - A-air dry, S-saturated, N-natural moisture content

Form 44/2

Laboratory - Uniaxial Compression Test Summary

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Project N6 Galway City Outer By-Pass Contract 2

Contract KC3210

Sheet

Sample Details				Test Data								
Hole	Depth	Description	Length Dia. mm	Test Date	W %	γ_b Mg/m^3	Strain at Failure	Test Time secs	At 50% Stress		UCS Value MPa	NOTES (Failure Mode, Orientation etc.)
									Secant Mod. E MN/m^2	Poiss. Ratio		
RC70	11.0-11.31		170.9 74.9	05/02/04	0.1 Nat	2.71		1040			102.3	Axial Cleavage
RC72	15.8-16.25		173.1 74.7	05/02/04	0.1 Nat	2.74		874			86.4	Axial Cleavage
RC87	4.89-5.09		176.1 75.4	24/12/03	0.3 Nat	2.70		619			92.0	Axial Cleavage
RC87A	7.82-8.14		171.1 75.5	24/12/03	0.2 Nat	2.72		608			89.6	Axial Cleavage
RC88	2.77-3.02		170.3 75.4	24/12/03	0.2 Nat	2.71		682			100.9	Axial Cleavage
RC89	3.48-3.70		132.9 63.0	06/02/04	0.1 Nat	2.70		611			91.9	Axial Cleavage
RC89	3.71-4.00		155.0 63.0	06/02/04	0.1 Nat	2.70		679			93.8	Axial Cleavage
RC91	3.23-3.46		146.0 63.0	06/02/04	0.1 Nat	2.69		177			85.5	Axial Cleavage
RC93	2.50-2.75		139.0 62.8	02/02/04	0.1 Nat	2.73		270			37.7	Axial cleavage
RC106	13.0-13.63		164.3 63.2	16/12/03	0.3 Nat	2.71		302			67.1	Axial Cleavage
RC115	2.50-2.88		115.0 63.2	16/12/03	0.2 Nat	2.73		607			95.2	Axial Cleavage
RC118	1.15-1.34		139.7 63.1	02/02/04	0.1 Nat	2.73		287			49.3	Axial cleavage
RC122	3.85-4.30		182.2 67.4	13/12/03	0.2 Nat	2.72		529			99.9	Axial Cleavage
RC124	6.70-7.09		169.3 67.2	16/12/03	0.1 Nat	2.70		480			90.1	Axial Cleavage

Remarks Tests performed and reported in accordance with ISRM (1981). Applied stress Rate 0.5 to 1 MPa/sec.
All testing performed along core axis unless otherwise stated in the notes.
Moisture condition (w%) - A-air dry, S-saturated, N-natural moisture content

Form 44/2

Laboratory - Uniaxial Compression Test Summary

GEOTECH

Project N6 Galway City Outer By-Pass Contract 2

Contract KC3210

Sheet

Sample Details				Test Data								
Hole	Depth	Description	Length Dia. mm	Test Date	W %	γ_b Mg/m^3	Strain at Failure	Test Time secs	At 50% Stress: Secant Mod. E MN/m^2	At 50% Stress: Poiss. Ratio	UCS Value MPa	NOTES (Failure Mode, Orientation etc.)
RC126	3.40-3.84		181.1 67.2	13/12/03	0.4 Nat	2.62		207			41.2	Axial Cleavage
RC135	4.15-4.65		180.0 67.1	13/12/03	0.6 Nat	2.69		566			78.9	Axial Cleavage
RC138	3.70-3.92		176.5 67.3	13/12/03	0.1 Nat	2.69		525			77.7	Axial Cleavage
RC140	2.15-2.35		106.1 67.4	13/12/03	0.1 Nat	2.70		608			70.9	Axial Cleavage

Remarks Tests performed and reported in accordance with ISRM (1981). Applied stress Rate 0.5 to 1 MPa/sec.
All testing performed along core axis unless otherwise stated in the notes.
Moisture condition (w%) - A-air dry, S-saturated, N-natural moisture content

Form 44/2

Laboratory - Uniaxial Compression Test Summary

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Project N6 Galway City Outer By-Pass Contract 2

Contract KC3210

Sheet

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m 3	Test	σ_3 kPa	C kPa	
RC6A	5.80 - 6.17	CS										Porosity: 1.40% Dry Density: 2.62kg/m3
RC6A/7	0.00	COMB										Water Sol. Chl = <0.01% SO3 (2:1) = 0.04g/l Passing 2mm = 100%
RC124	6.70 - 7.09	CS										Porosity: 0.49% Dry Density: 2.71kg/m3
RC 122/124	0.00	COMB										Water Sol. Chl = <0.01% SO3 (2:1) = 0.01g/l Passing 2mm = 100%

Remarks

Form 10/2

Laboratory - Results Summary

Project: N6 Galway City Outer By-Pass Contract 2

Contract: KC3210

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Sheet

Determination of Aggregate Properties

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Hole Number	Sulphate Content g/l	Chloride Content %	Sound-ness	10% Fines kN	Water Absorp-tion %	Slake Dura-bility	PSV	AAV
RC6A and RC7	0.04	0.00	98	180	1.0	99.6	53	2.6
RC122 and 124	0.01	0.00	100	170	0.3	99.4	38	15
RC10 7.75 – 8.65	0.09	0.00	-	240	-	98.8	52	-

Notes: 14 -10mm size used for soundness and 10% fines.
Slake durability except RC10, PSV and AAV tested by Celtest Ltd, Bangor, Gwynedd, LL57 4DA. U.K.

Notes:	Project N6 Galway City Outer Bypass, Contract 2 Project No. KC3210 Carried out for	Table Sheet 1 of 1

Results of ICP Analysis

Hole Number & Depth	SiO_2 mg/kg	Al_2O_3 mg/kg	CaO mg/kg	MgO mg/kg	Na_2O mg/kg	MnO mg/kg	Fe_2O_3 mg/kg
RC006A 5.80 - 6.17	789	7140	24343	398	419	310	16299
RC124 6.7-7.09	445	263	628151	4957	191	43	289

Oxide quantities proportioned from elemental quantities appended.

Notes:	Project N6 Galway City Outer Bypass, Contract 2 Project No. KC3210 Carried out for	Table Sheet 1 of 1

Units :		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg									
Method Codes :		ICPSOIL	ICPSOIL	ICPSOIL	ICP/MAJ	ICPMAJ	ICPMAJ	ICPMS									
Detection Limits :		4	6	1	1	3	1	10									
UKAS Accredited :		yes	yes	yes	no	no	no	no									
TES ID Number CU	Client Sample Description	Aluminium	Iron	Manganese	Calcium	Magnesium	Sodium	Silicon									
0400581	RC006A 5.8-6.17	3780	11400	240	17400	2140	311	369									
0400582	RC124 6.7-7.09	139	202	33	449000	2990	142	208									

TES Bretby
PO Box 100, Bretby Business Park,
Burton-on-Trent, Staffordshire, DE15 0XD
Tel +44 (0) 1283 554400
Fax +44 (0) 1283 554422

Client Name	Soil Mechanics
Contact	Mr J Booth

Galway City Bypass #2

Soils Sample Analysis

Date Printed	26 January 2004
Report Number	EFS/040101
Table Number	1

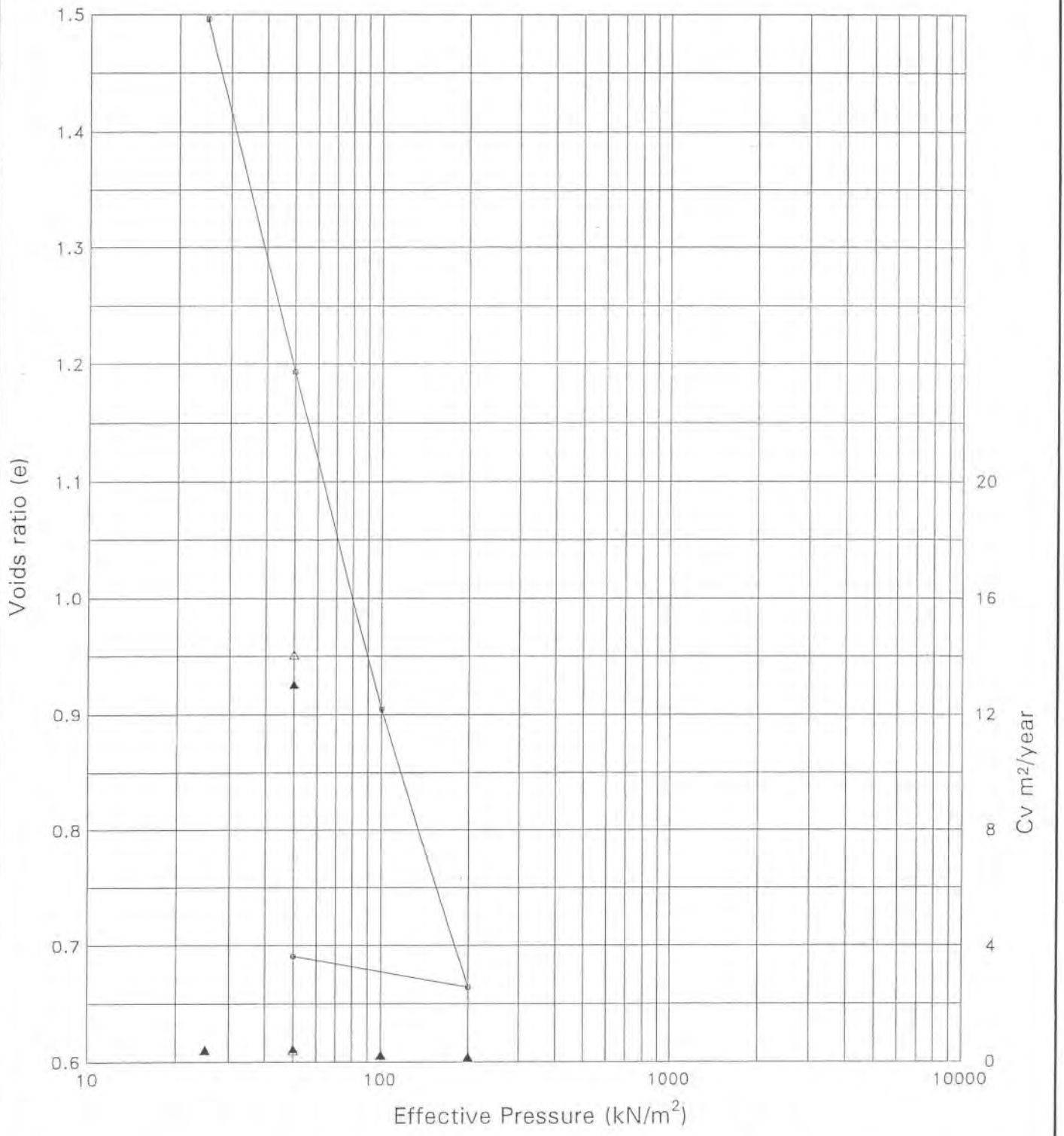
TES Bretby

Samples				Water Content		Density			Consolidation				
Hole	Depth	Type	Description	Initial %	Final %	Initial Mg/m^3	Final Mg/m^3	Dry Mg/m^3	Prep.	Test Drainage	P'o kN/m^2	Cv m^2/year t_{50}	Cv m^2/year t_{90}
100A	3.70 - 4.70	P	Very soft grey very silty CLAY	102	55	1.91	2.17	.95	NAT	One Way Vertical	25	3.10	2.72
											50	1.31	1.18
											100	.77	.86
											200	.65	.69
											50	3.77	4.00
110	3.50 - 4.50	P	Soft grey brown CLAY with ocasional rootlets	200	122	1.20	1.26	.40	NAT	Two Way Vertical	25	2.00	1.91
											50	1.10	1.16
											100	1.52	1.48
											50	.26	.31
110	6.50 - 7.50	P	Very soft grey very silty CLAY	109	55	1.95	2.50	.93	NAT	Two Way Vertical	25	.39	.42
											50	.45	.38
											100	.23	.24
											200	.15	.18
											50	13.05	14.05

Remarks Volume Change used to calculate Cv and Mv values

Form 18/2

Laboratory - Hydraulic Cell Consolidation Test	**Project** N6 Galway	**Contract** KC3210
Exploration Associates		



Sample Dimensions	97.13 mm dia. 49.45 mm high	Pressure	kN/m2	0 25	25 50	50 100	100 200	200 50						
Initial Voids Ratio	1.834	mv	m2/MN	4.770	4.853	2.631	1.264	.107						
Final Voids Ratio	.691													
Initial Water Content	108.83 %	Cv Log t50 ▲	m2/yr	.39	.45	.23	.15	13.05						
Final Water Content	55.06 %													
Initial Saturation	157.24 %	Cv Root t90 △	m2/yr	.42	.38	.24	.18	14.05						
Initial Bulk Density	1.952 Mg/m3													
Initial Dry Density	.935 Mg/m3	Final Voids Ratio		1.496	1.193	.905	.664	.691						
Particle Density	2.65 ASSUMED													
Sample Type	UNDISTURBED													
Drainage Condition	Two Way Vertical													
Strain Condition	FREE													
Mv & (e) calculated using	Vol. Change Data													
Cvs calculated using	Vol. Change Data													

Description
Very soft grey very silty CLAY

Hole 110
Depth 6.50 - 7.50
Sample Type P

Laboratory - Hydraulic Cell Consolidation Test

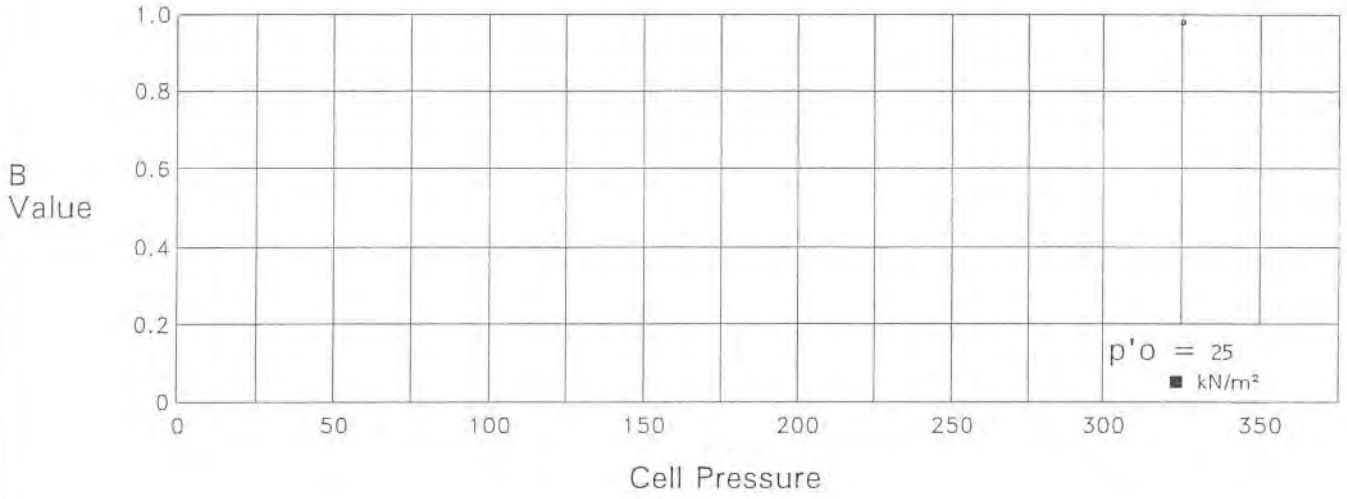
Project
N6 Galway

Contract KC3210

Figure

Exploration Associates

Form 34/0



Sample Information

Diameter	:	97.13 mm	Specific Gravity	:	2.65 ASSUMED
Length	:	49.45 mm	Initial Voids Ratio	:	1.834
Area	:	7409.632 mm^2	Initial B Value	:	.98
Volume	:	366.406 cm^3	Final B Value	:	.98

Saturation B Value/Cell Pressure

Borehole 110
Depth 6.50 - 7.50 m

Remarks

Laboratory - Hydraulic Cell Consolidation Test

Project N6 Galway

Contract KC3210

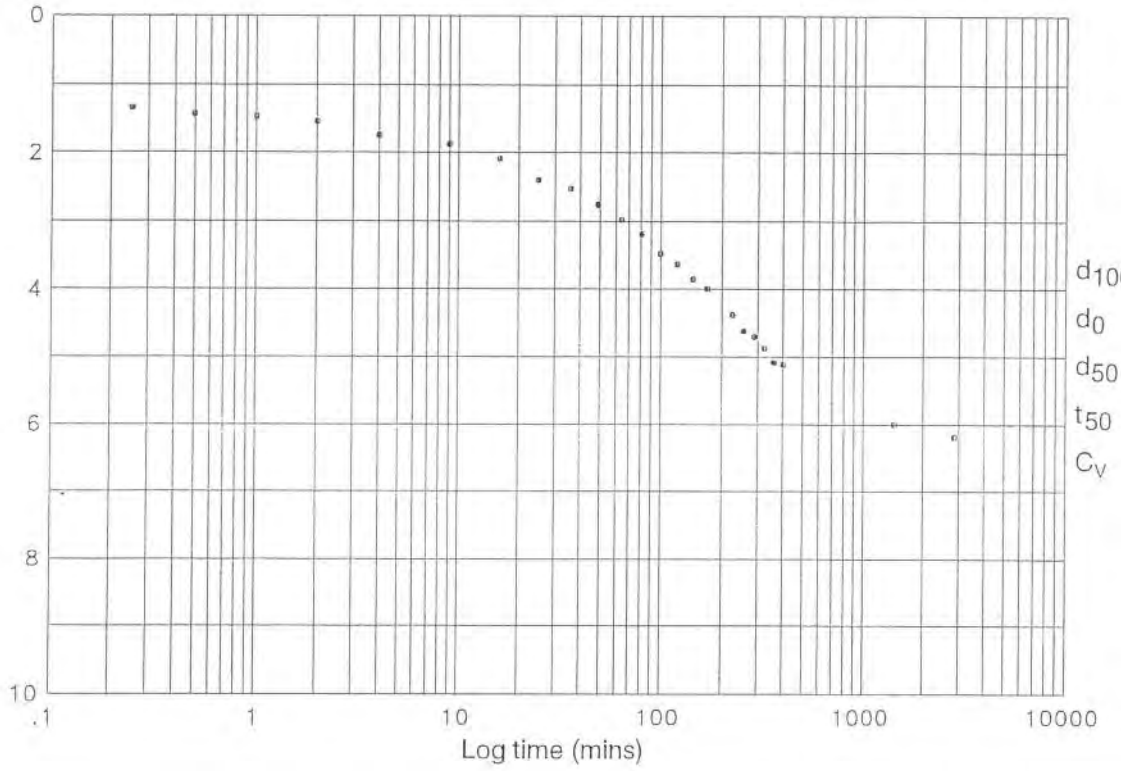
Exploration Associates

Figure

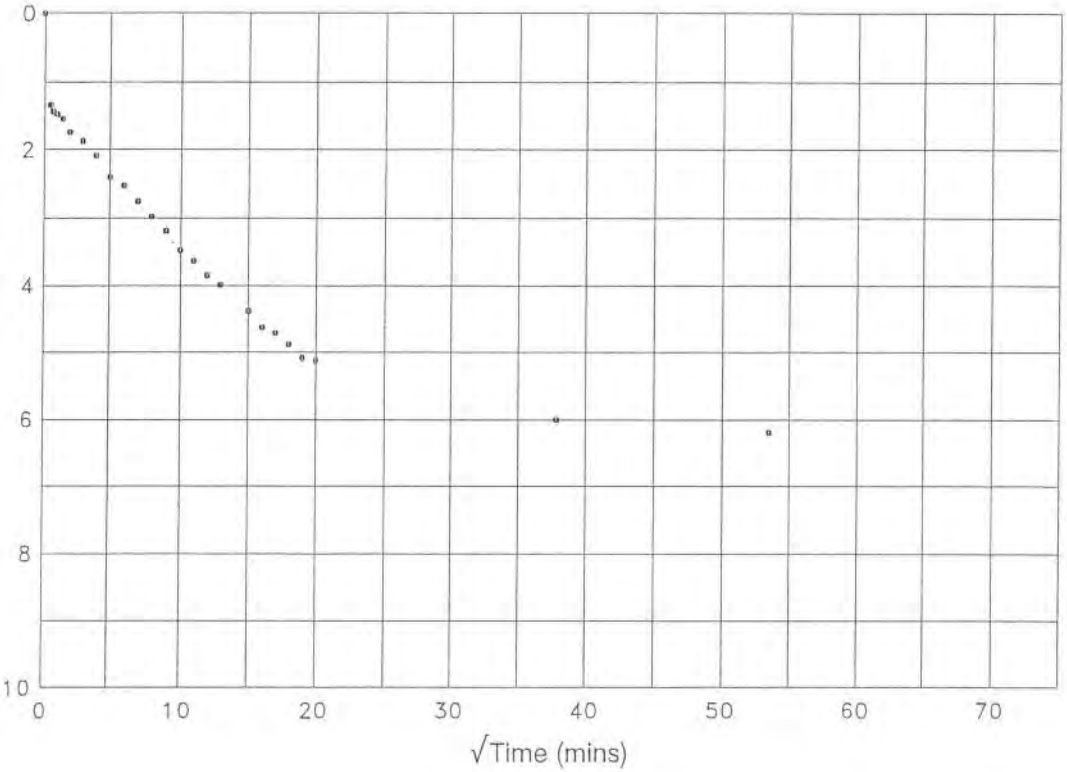
Form 28/1

Stage = 1

Applied Load = 0 - 25 kN/m²



d_{100} = 4.788 mm
d_0 = 1.204 mm
d_{50} = 2.996 mm
t_{50} = 65.00 mins
C_V = .78 m²/year



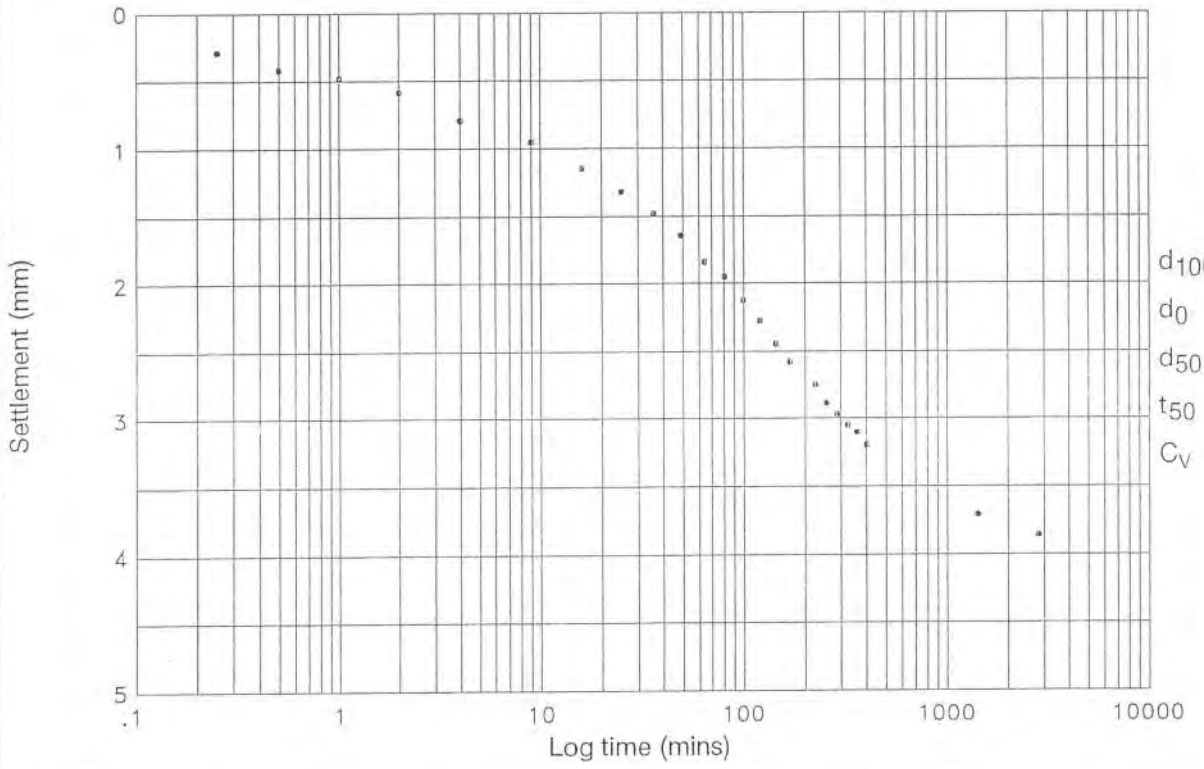
t_{90} = 459.80 mins
C_V = .47 m²/year

Initial Height = 47.310 mm
Height Change = 6.188 mm
Final Height = 41.122 mm

Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 2

Applied Load = 25 - 50 kN/m²



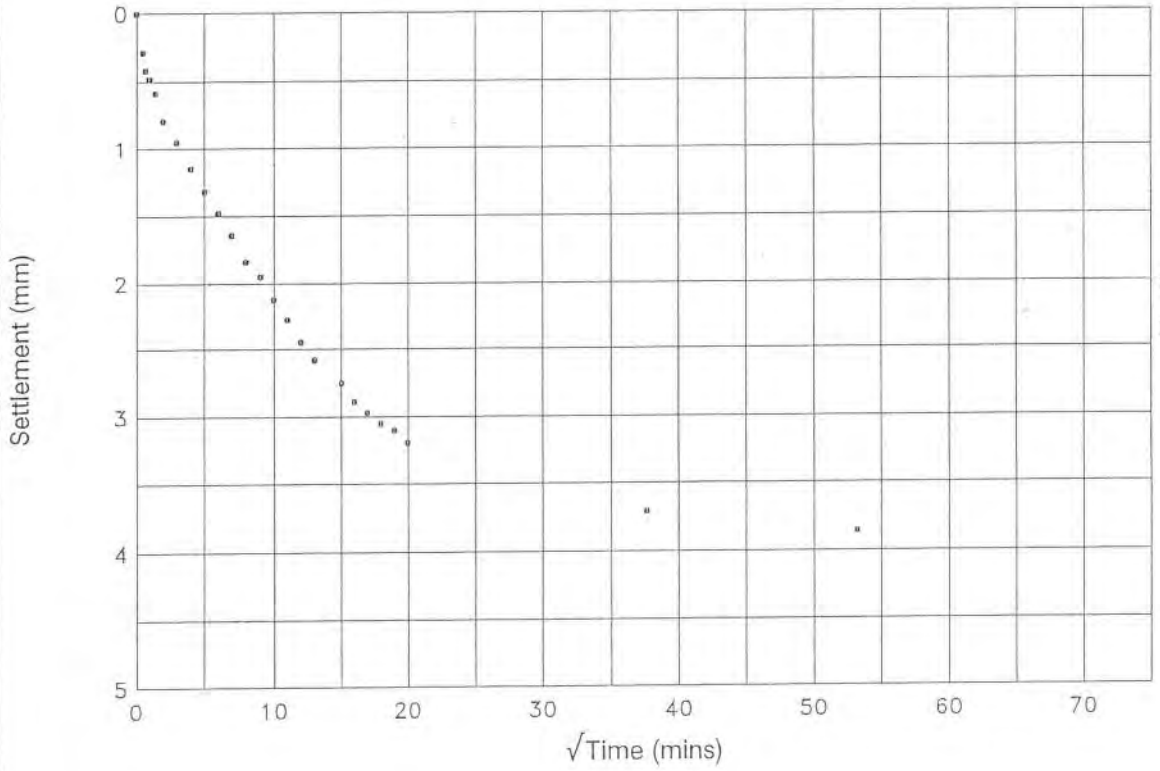
d_{100} = 3.858 mm

d_0 = .096 mm

d_{50} = 1.977 mm

t_{50} = 83.69 mins

C_V = .48 m²/year



t_{90} = 329.66 mins

C_V = .52 m²/year

Initial Height = 41.074 mm

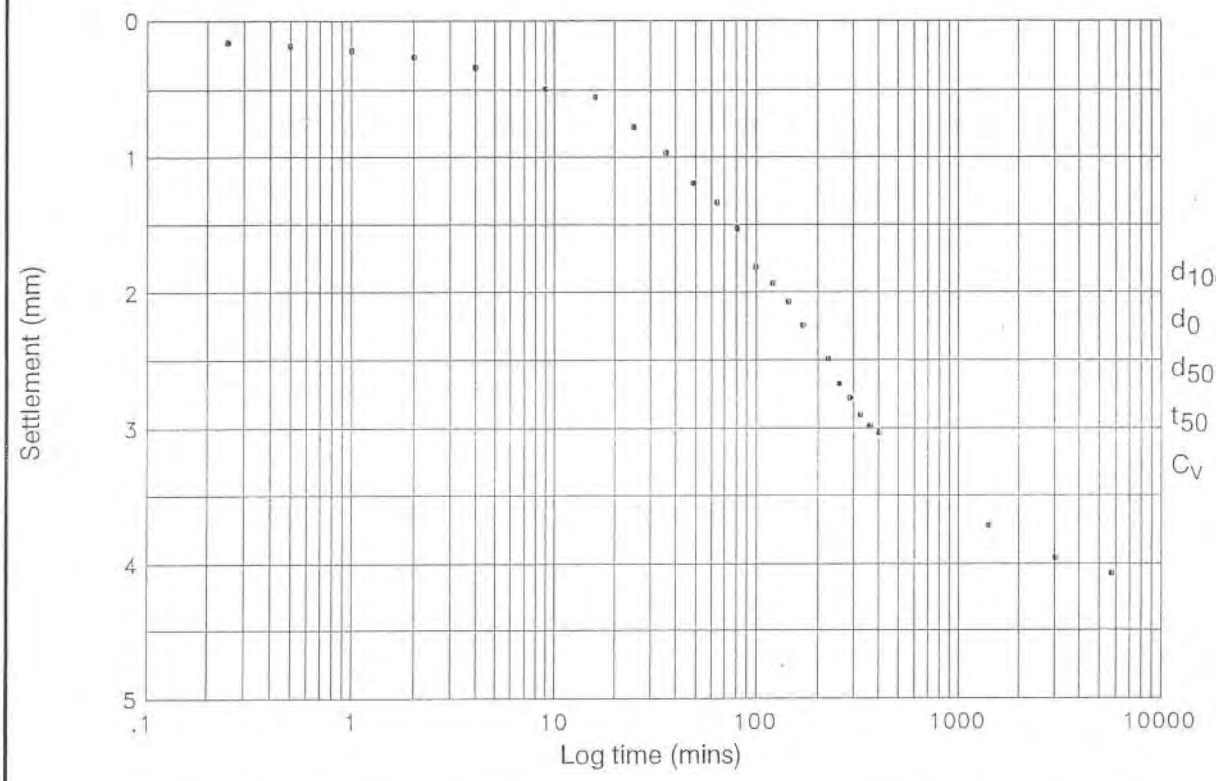
Height Change = 3.858 mm

Final Height = 37.216 mm

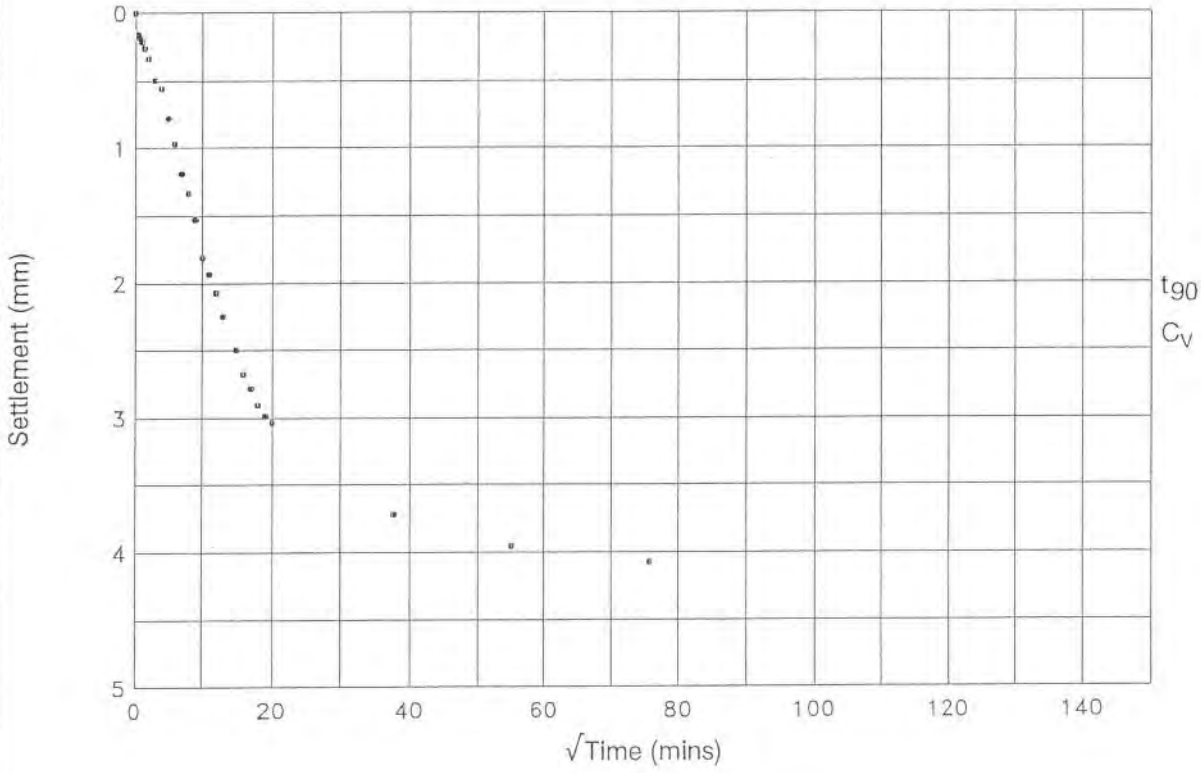
Remarks	Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway Contract KC3210
Exploration Associates	Form 213/1

Stage = 3

Applied Load = 50 - 100 kN/m²



d_{100} = 4.074 mm
d_0 = .098 mm
d_{50} = 2.086 mm
t_{50} = 146.11 mins
C_V = .22 m²/year



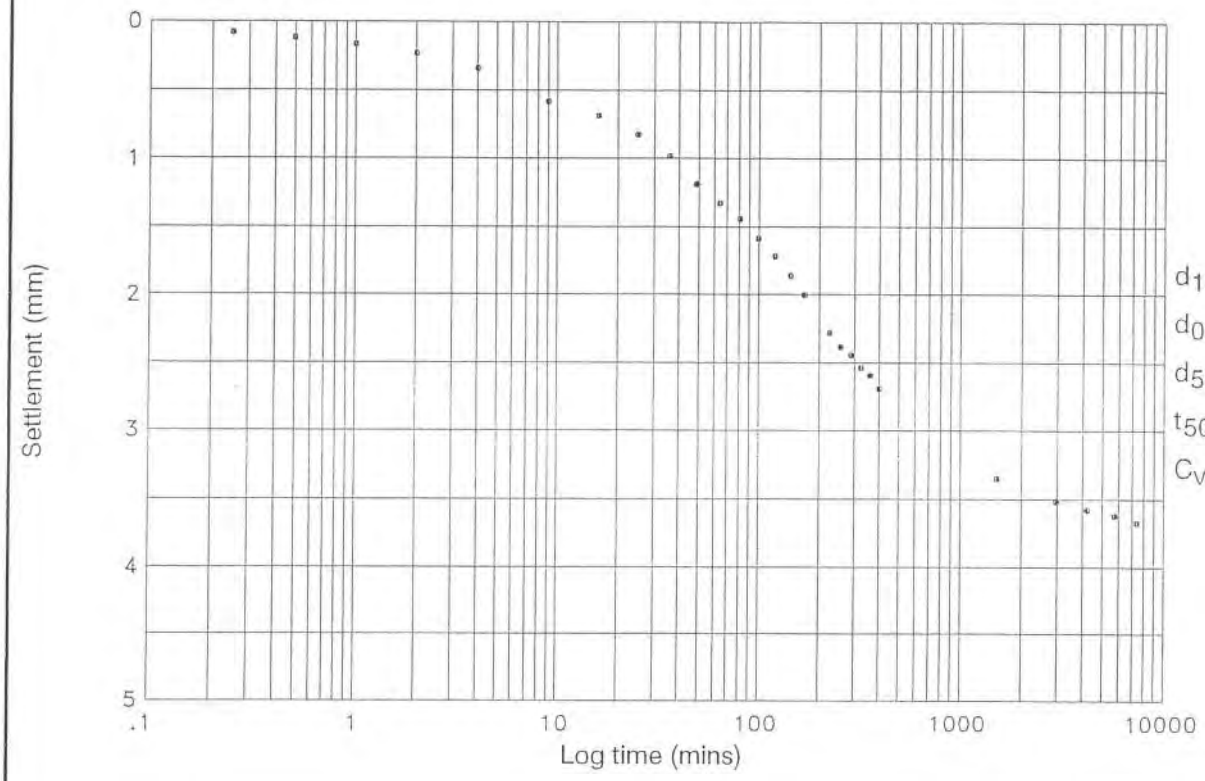
t_{90} = 594.96 mins
C_V = .23 m²/year

Initial Height = 37.056 mm
Height Change = 4.074 mm
Final Height = 32.982 mm

Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 4

Applied Load = 100 - 200 kN/m²



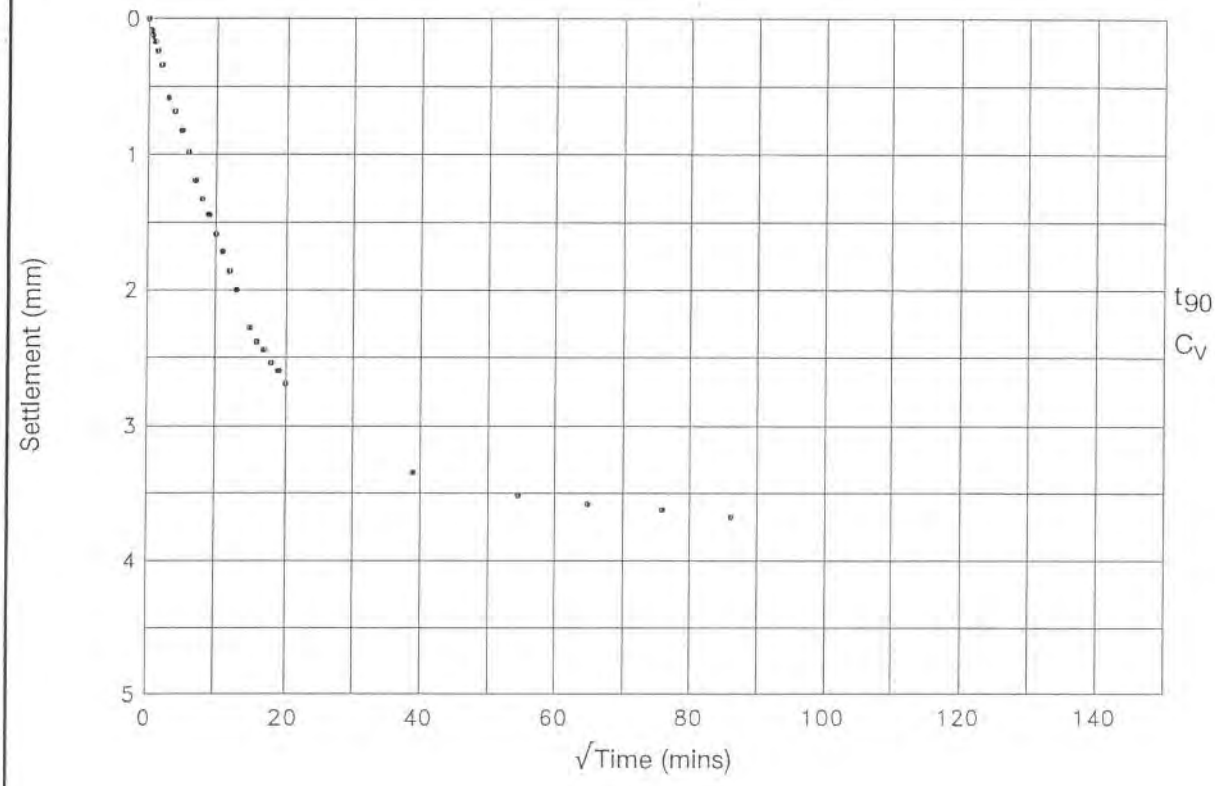
d_{100} = 3.753 mm

d_0 = .002 mm

d_{50} = 1.878 mm

t_{50} = 146.94 mins

C_V = .17 m²/year



t_{90} = 548.77 mins

C_V = .19 m²/year

Initial Height = 32.634 mm

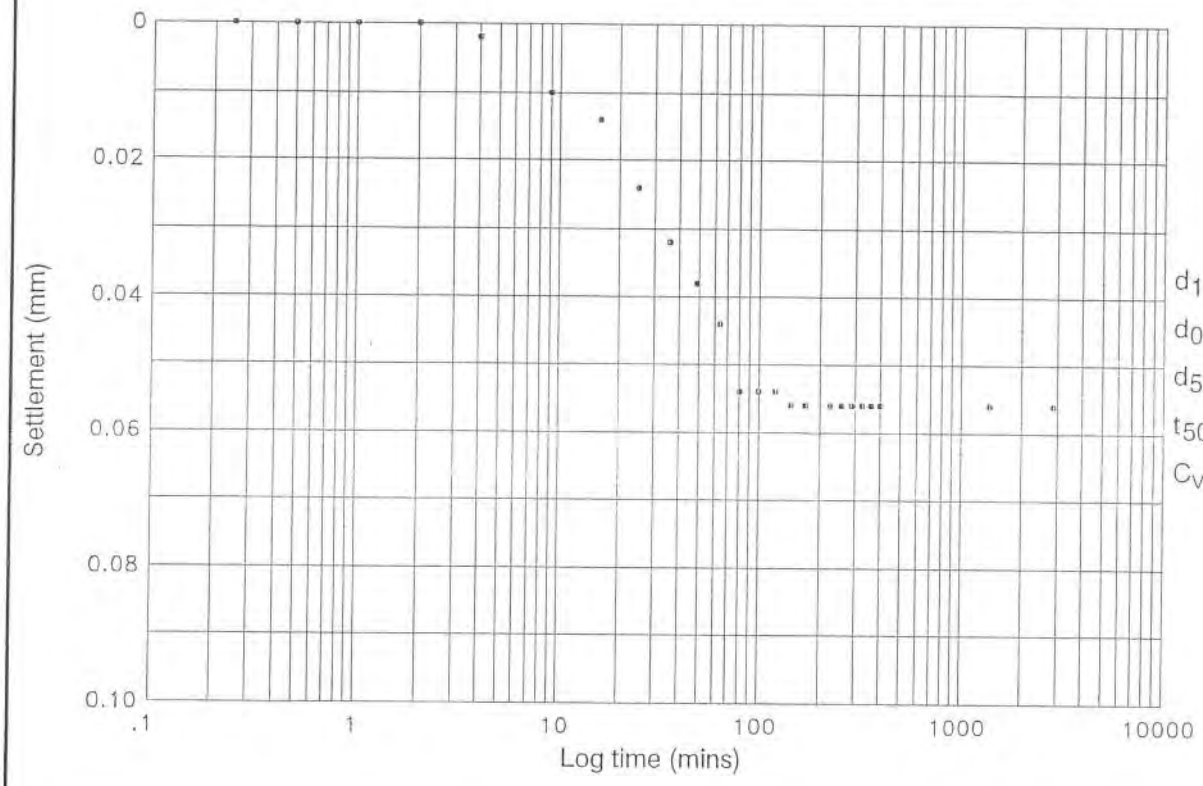
Height Change = 3.670 mm

Final Height = 28.964 mm

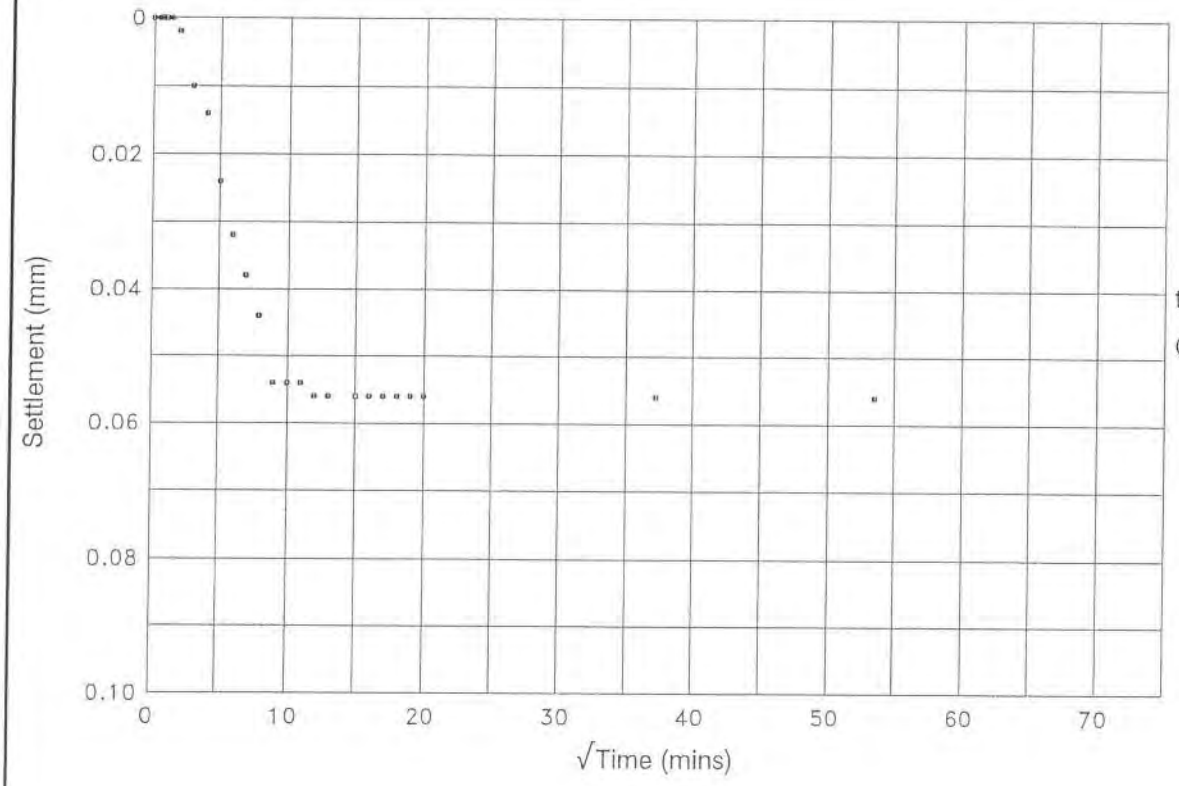
Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 5

Applied Load = 200 - 50 kN/m²



d_{100} = .058 mm
d_0 = .000 mm
d_{50} = .029 mm
t_{50} = 31.64 mins
C_V = .69 m²/year



t_{90} = 124.45 mins
C_V = .75 m²/year

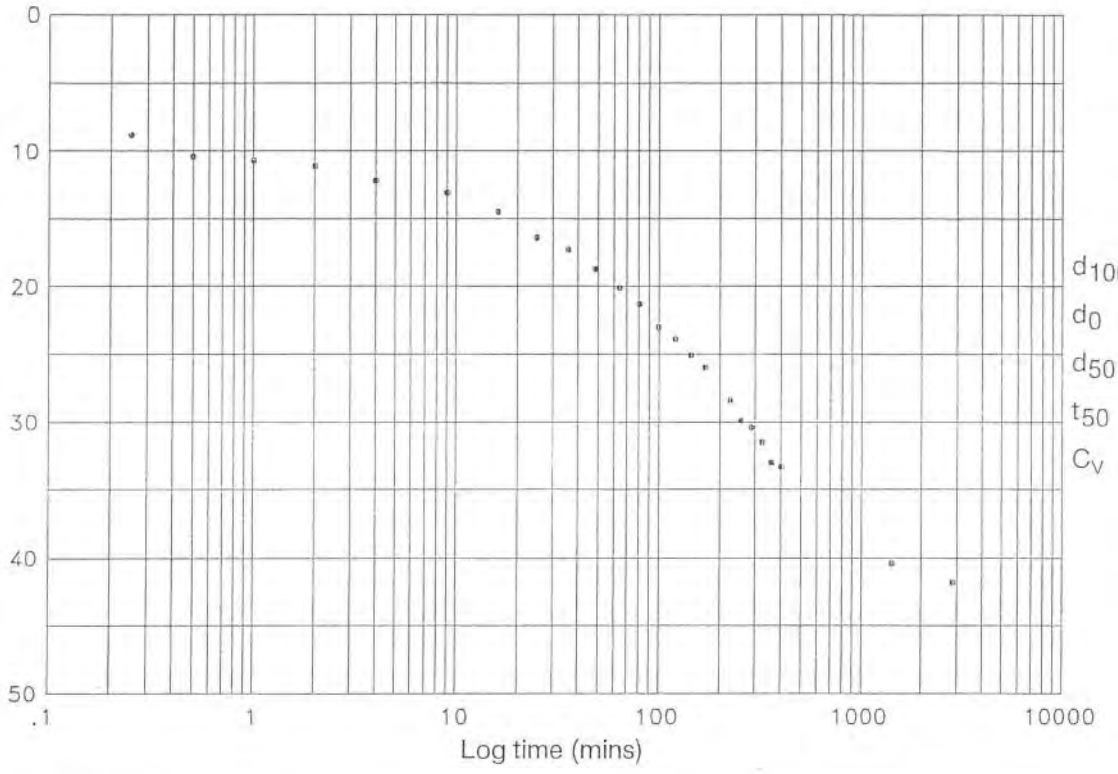
Initial Height = 29.164 mm
Height Change = -.056 mm
Final Height = 29.220 mm

Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		

Form 213/1

Stage = 1

Applied Load = 0 - 25 kN/m²



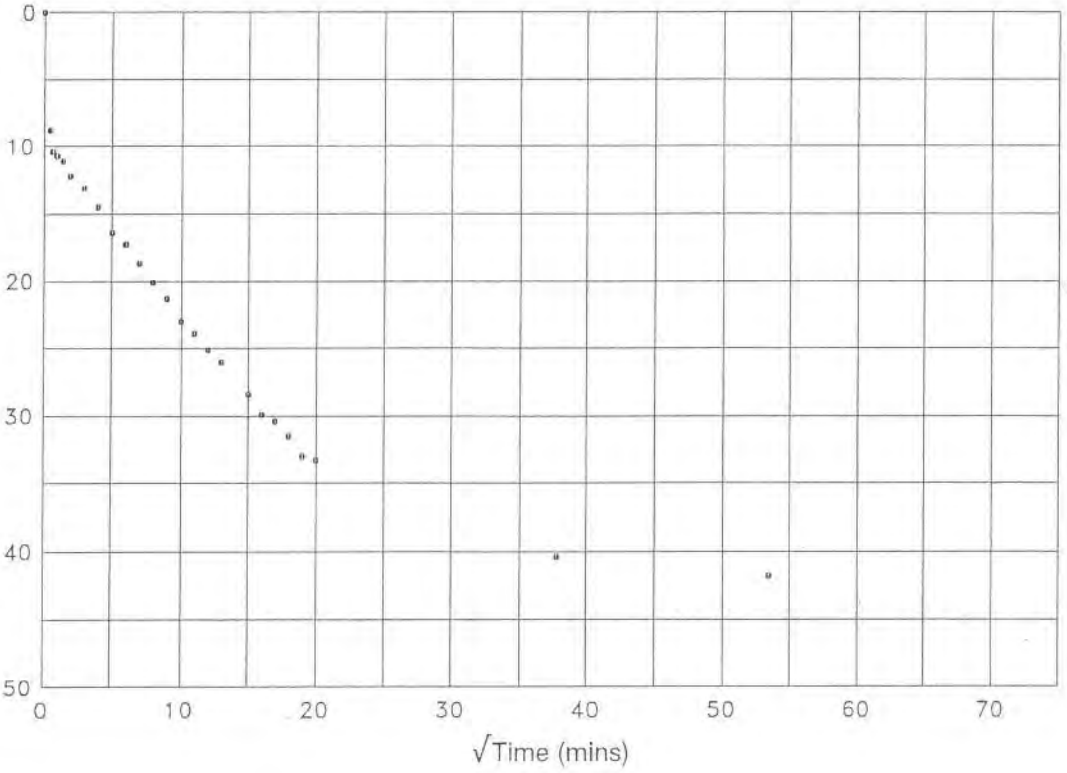
d_{100} = 41.800 cc

d_0 = 6.900 cc

d_{50} = 24.350 cc

t_{50} = 129.16 mins

C_v = .39 m²/year



t_{90} = 518.26 mins

C_v = .42 m²/year

Initial Volume = 350.550 cc

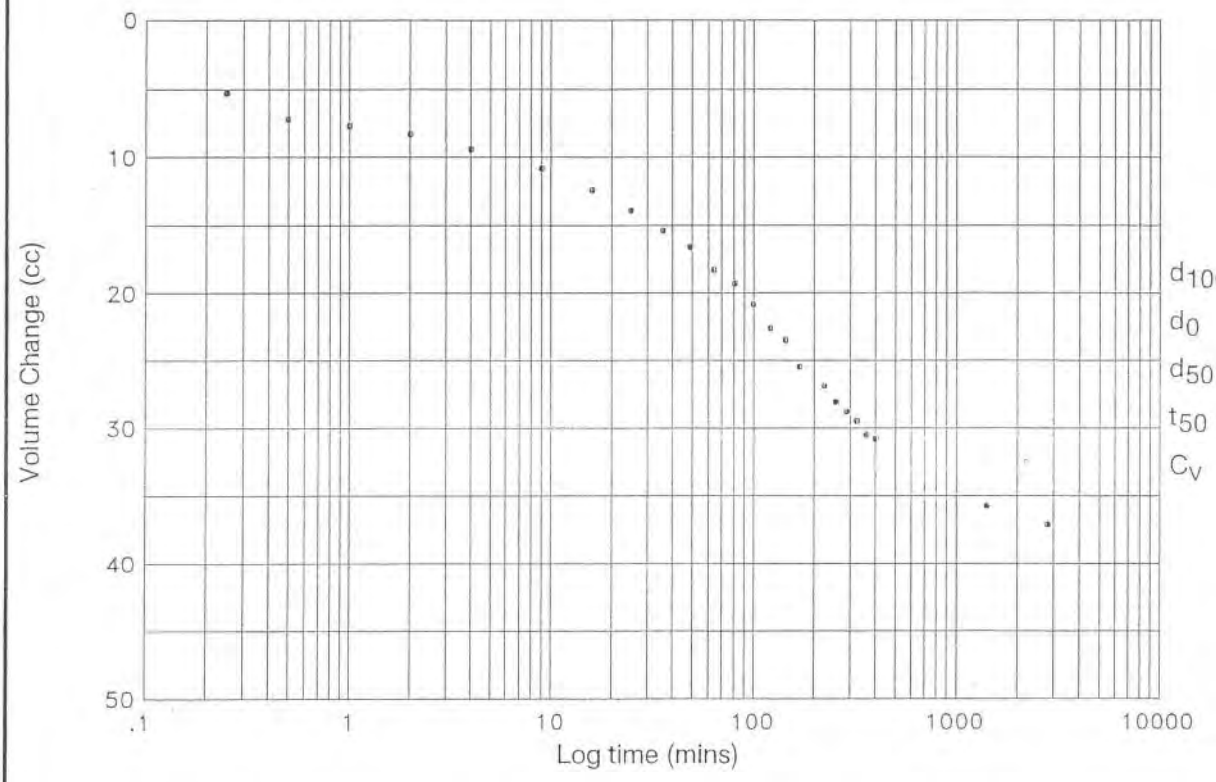
Volume Change = 41.800 cc

Final Volume = 308.750 cc

Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 2

Applied Load = 25 - 50 kN/m²



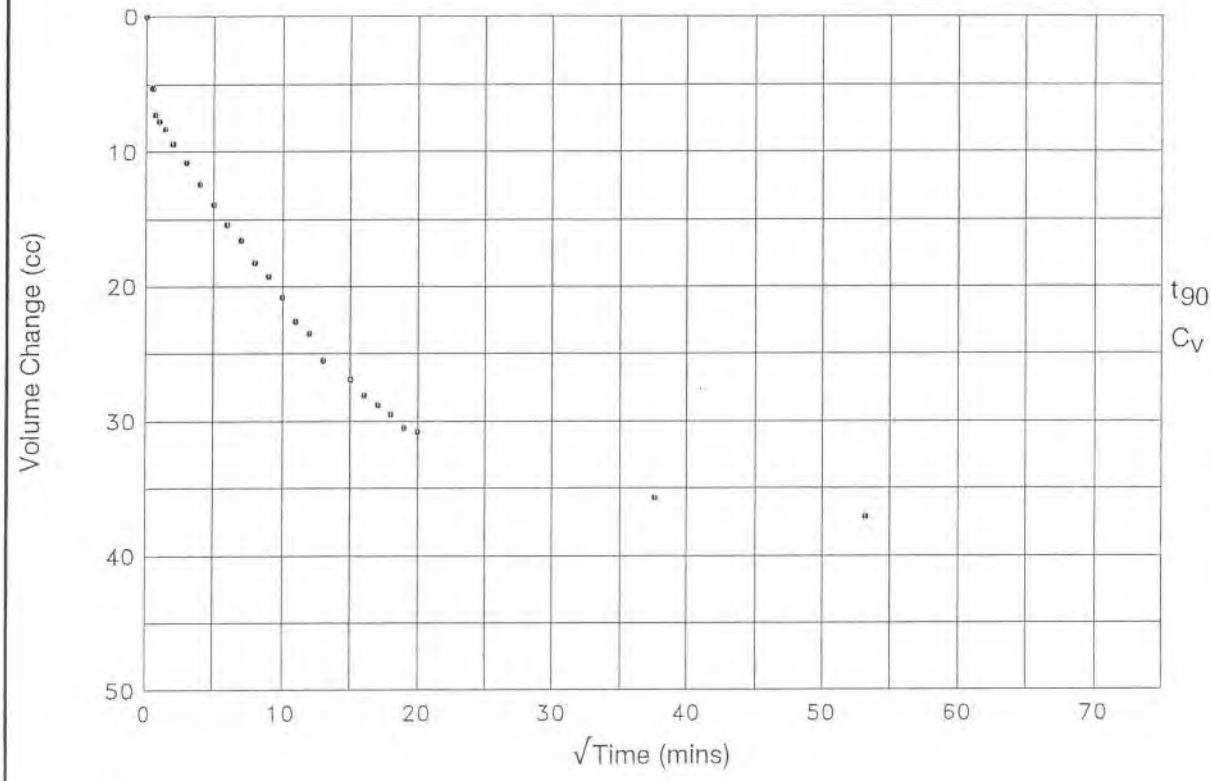
d_{100} = 37.100 cc

d_0 = 2.900 cc

d_{50} = 20.000 cc

t_{50} = 89.37 mins

C_V = .45 m²/year



t_{90} = 443.27 mins

C_V = .38 m²/year

Initial Volume = 308.394 cc

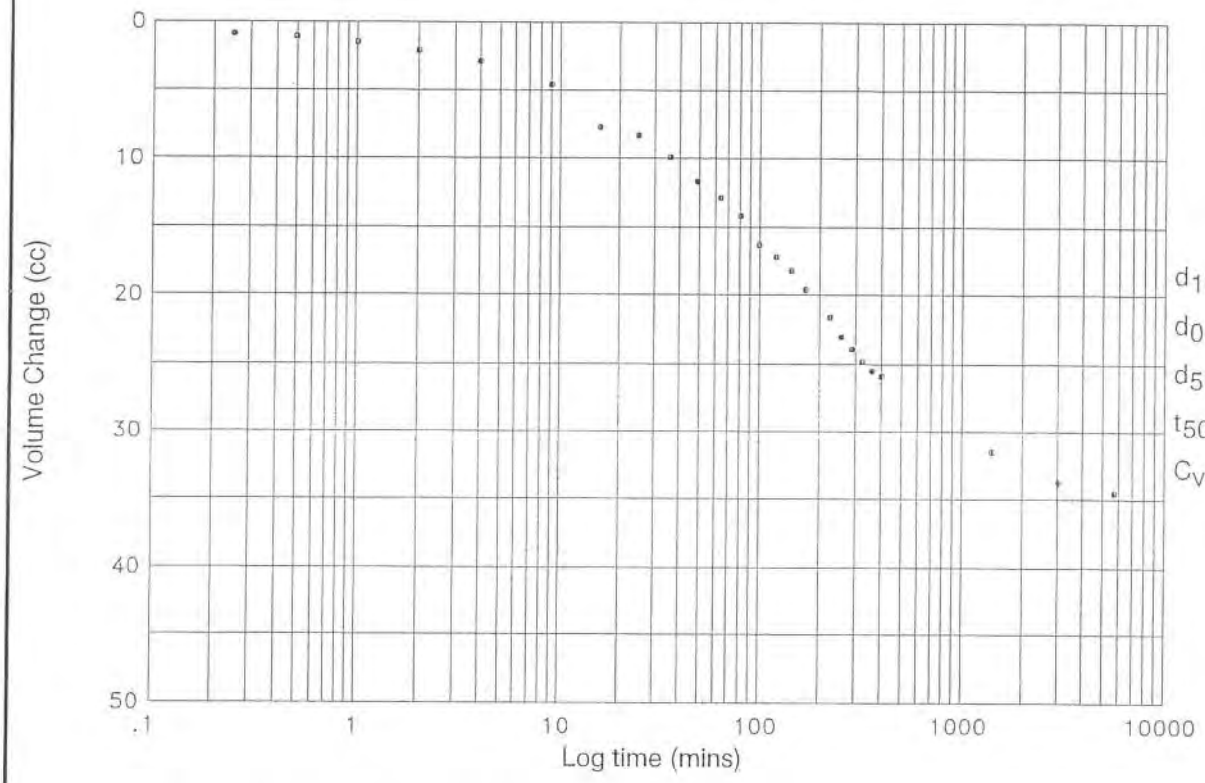
Volume Change = 37.100 cc

Final Volume = 271.294 cc

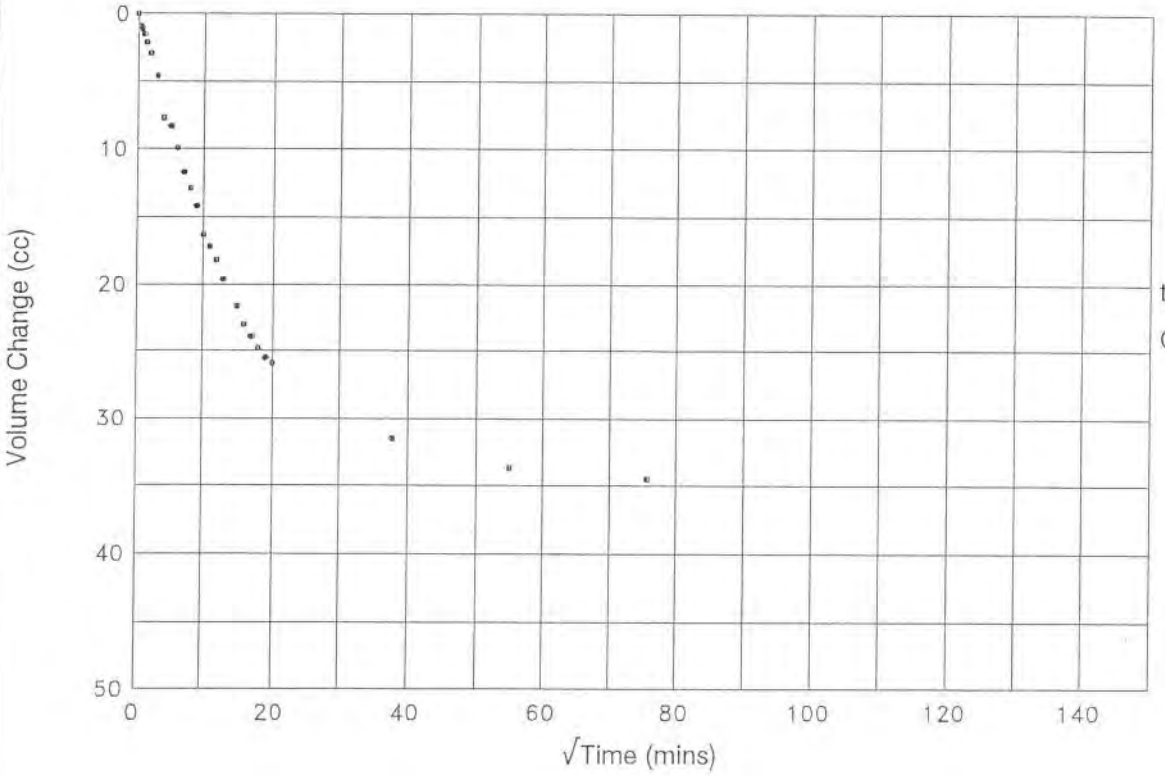
Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 3

Applied Load = 50 - 100 kN/m²



d_{100} = 35.833 cc
d_0 = .300 cc
d_{50} = 18.067 cc
t_{50} = 140.70 mins
C_V = .23 m²/year



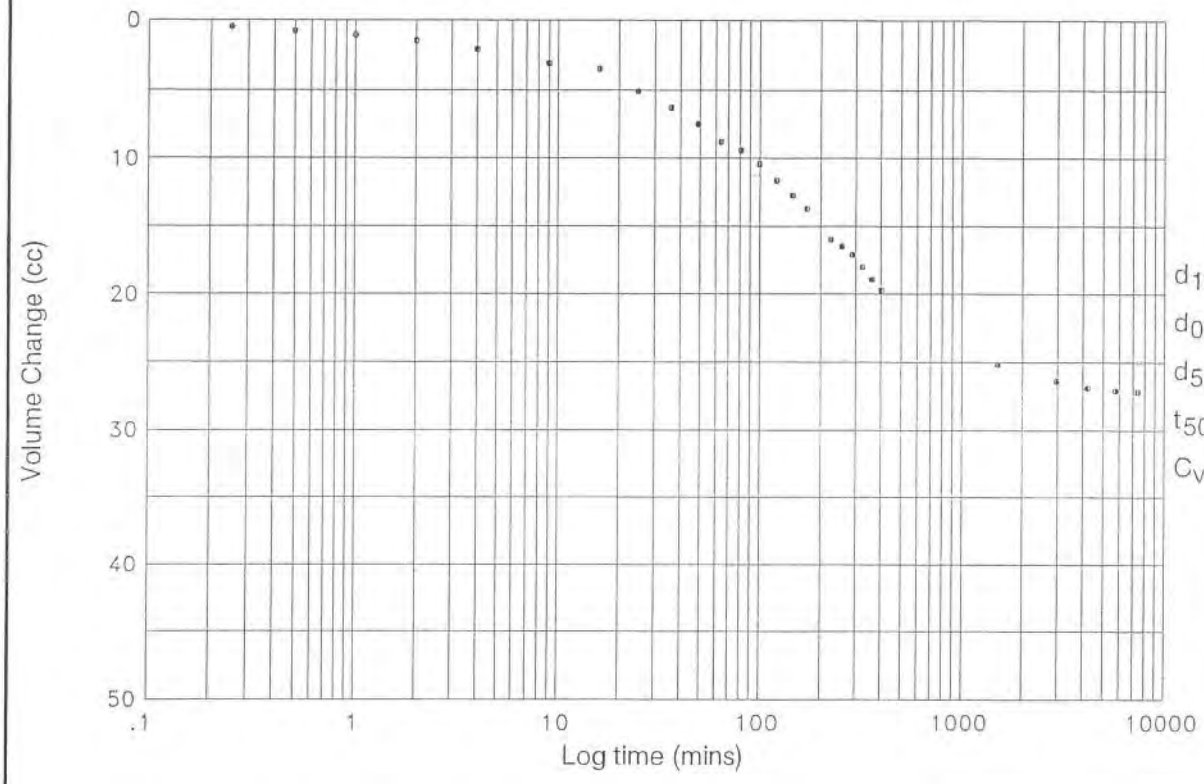
t_{90} = 565.81 mins
C_V = .24 m²/year

Initial Volume = 270.109 cc
Volume Change = 34.500 cc
Final Volume = 235.609 cc

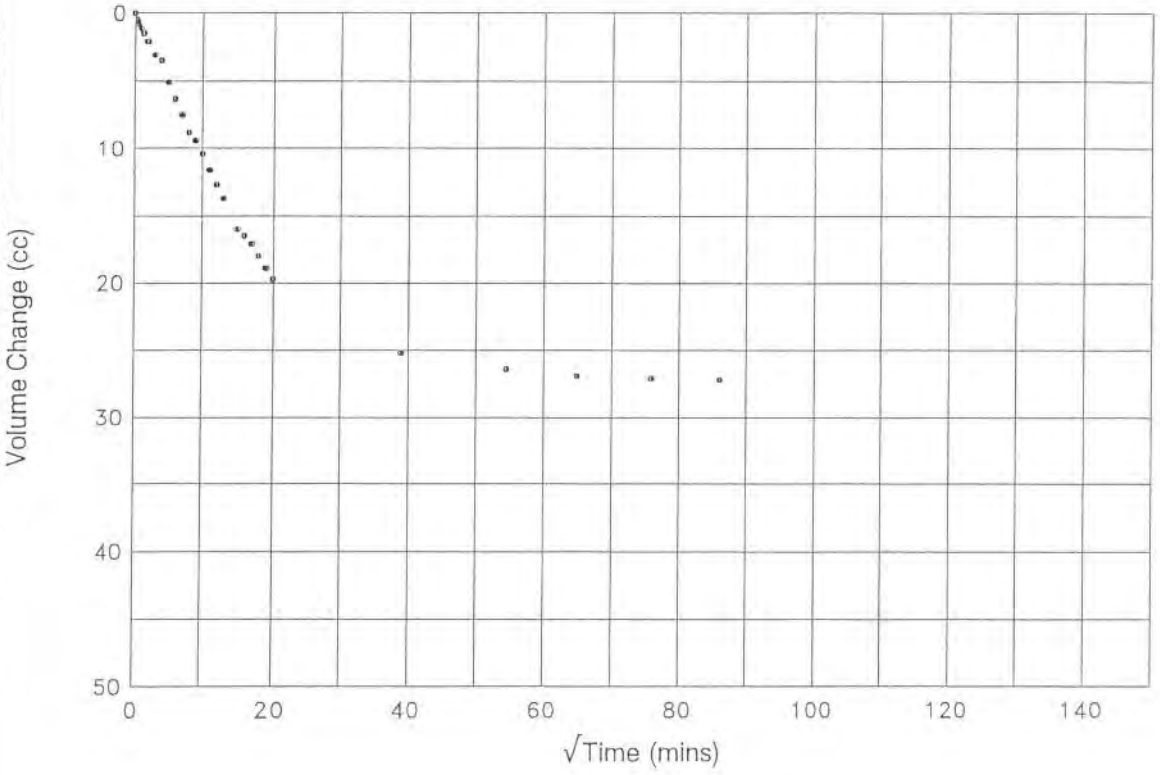
Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/D

Stage = 4

Applied Load = 100 - 200 kN/m²



d_{100} = 27.200 cc
d_0 = .000 cc
d_{50} = 13.600 cc
t_{50} = 166.32 mins
C_V = .15 m²/year



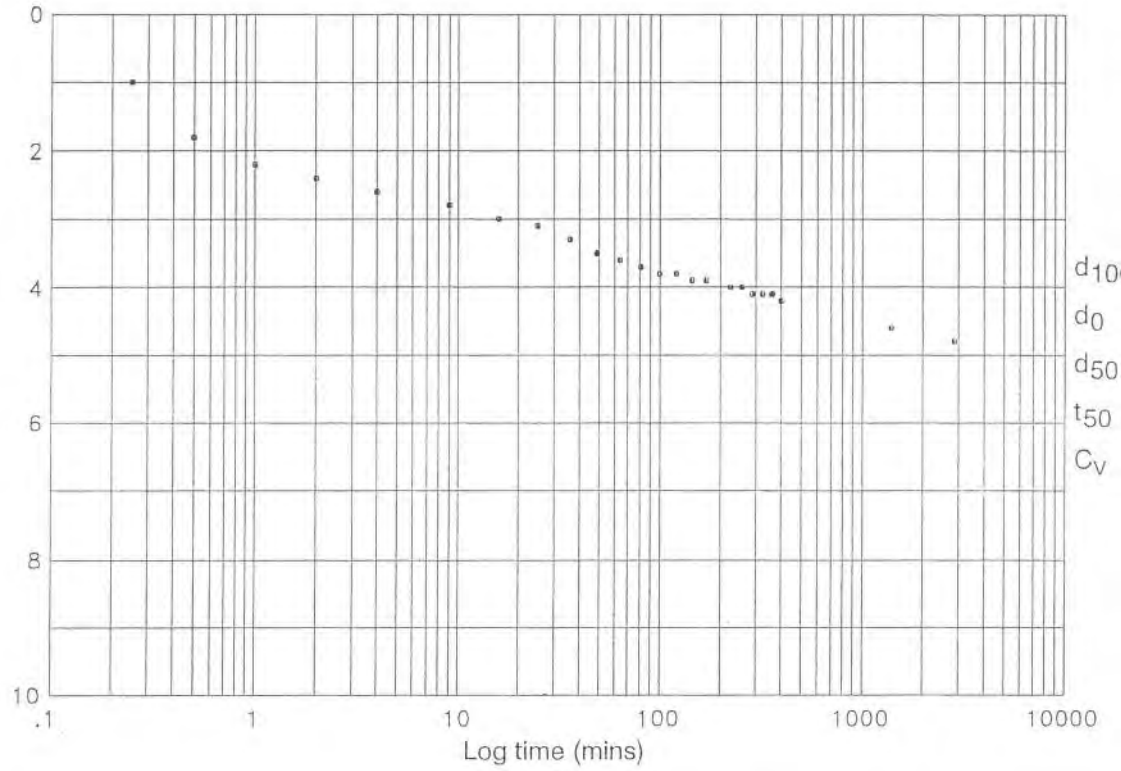
t_{90} = 601.06 mins
C_V = .18 m²/year

Initial Volume = 233.030 cc
Volume Change = 27.200 cc
Final Volume = 205.830 cc

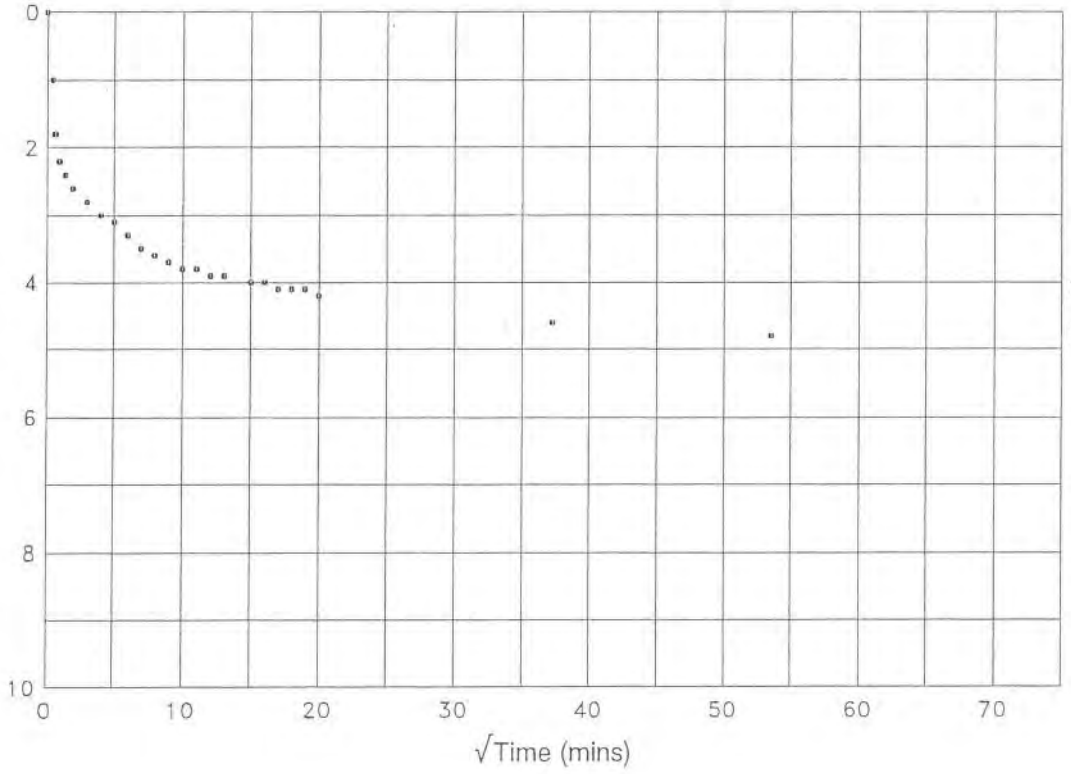
Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 5

Applied Load = 200 - 50 kN/m²



d_{100} = 4.700 cc
d_0 = .000 cc
d_{50} = 2.350 cc
t_{50} = 1.68 mins
C_V = 13.05 m²/year

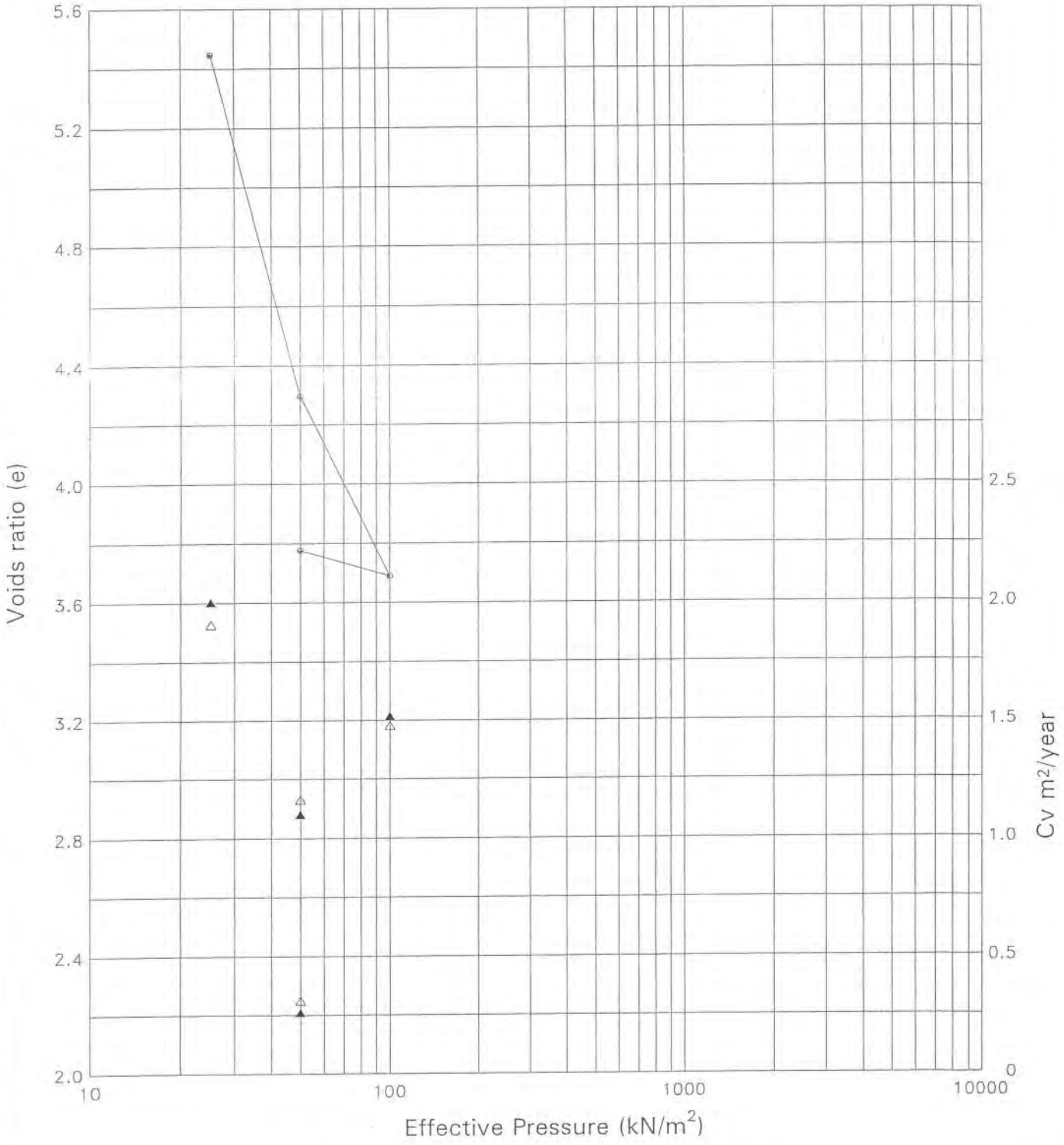


t_{90} = 6.66 mins
C_V = 14.05 m²/year

Initial Volume = 207.312 cc
Volume Change = -4.8 cc
Final Volume = 212.112 cc

Remarks		Depth 6.50 - 7.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		

Form 213/0



Sample Dimensions	102.76 mm dia. 53.24 mm high
Initial Voids Ratio	5.625
Final Voids Ratio	3.776
Initial Water Content	200.06 %
Final Water Content	122.12 %
Initial Saturation	94.25 %
Initial Bulk Density	1.201 Mg/m³
Initial Dry Density	.400 Mg/m³
Particle Density	2.65 ASSUMED
Sample Type	UNDISTURBED
Drainage Condition	Two Way Vertical
Strain Condition	FREE
Mv & (e) calculated using	Vol. Change Data
Cvs calculated using	Vol. Change Data

Pressure kN/m²	0 25	25 50	50 100	100 50
m_v m²/MN	1.077	7.142	2.290	.372
C_v Log t_{50} ▲ m²/yr	2.00	1.10	1.52	.26
C_v Root t_{90} △ m²/yr	1.91	1.16	1.48	.31
Final Voids Ratio	5.447	4.296	3.689	3.776

Description
Soft grey brown CLAY with ocasional rootlets

Hole 110
Depth 3.50 - 4.50
Sample Type P

Laboratory - Hydraulic Cell Consolidation Test

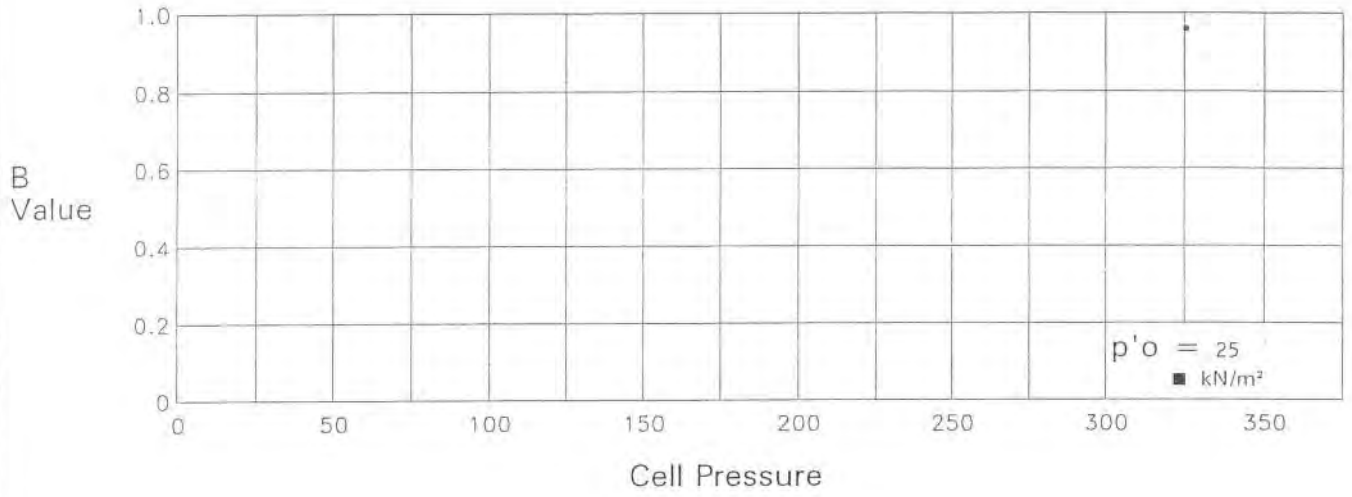
Project
N6 Galway

Contract KC3210

Figure

Exploration Associates

Form 34/0



Sample Information

Diameter	:	102.76 mm	Specific Gravity	:	2.65 ASSUMED
Length	:	53.24 mm	Initial Voids Ratio	:	5.625
Area	:	8293.504 mm^2	Initial B Value	:	.96
Volume	:	441.546 cm^3	Final B Value	:	.96

Saturation B Value/Cell Pressure

Borehole 110
Depth 3.50 - 4.50 m

Remarks

Laboratory - Hydraulic Cell Consolidation Test

Project
N6 Galway

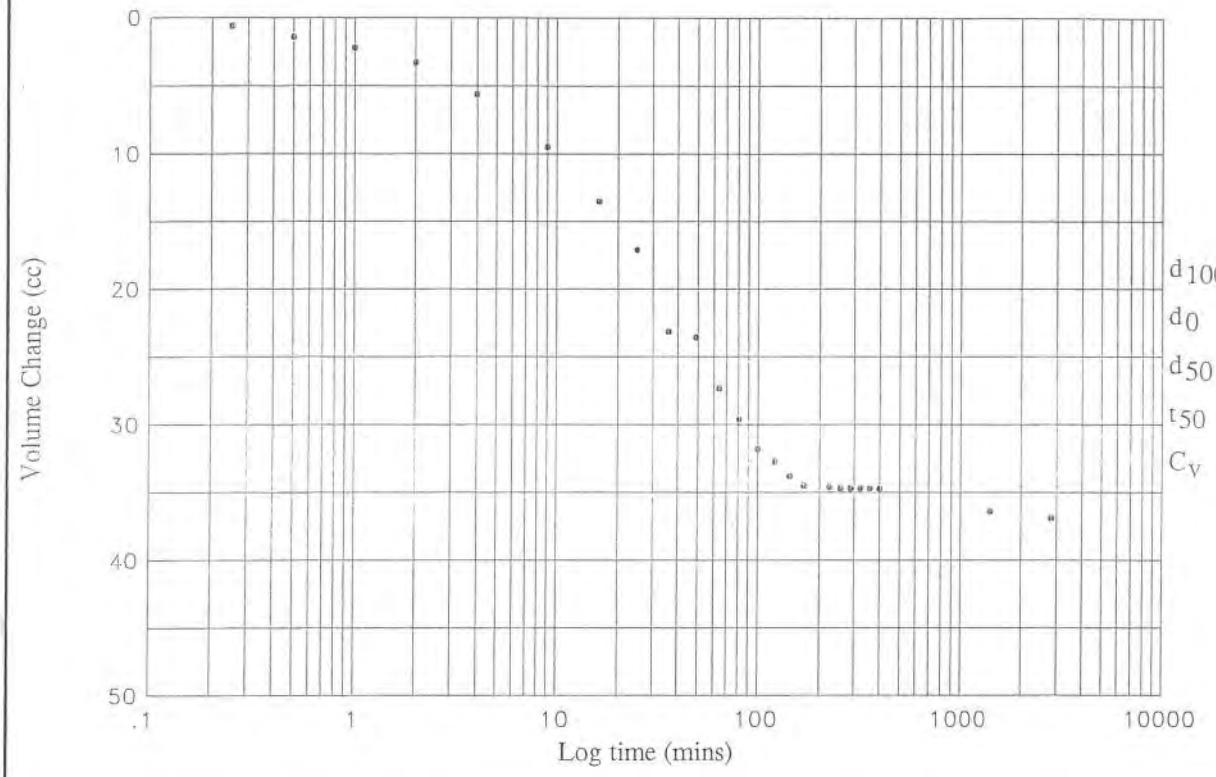
Contract KC3210

Exploration Associates

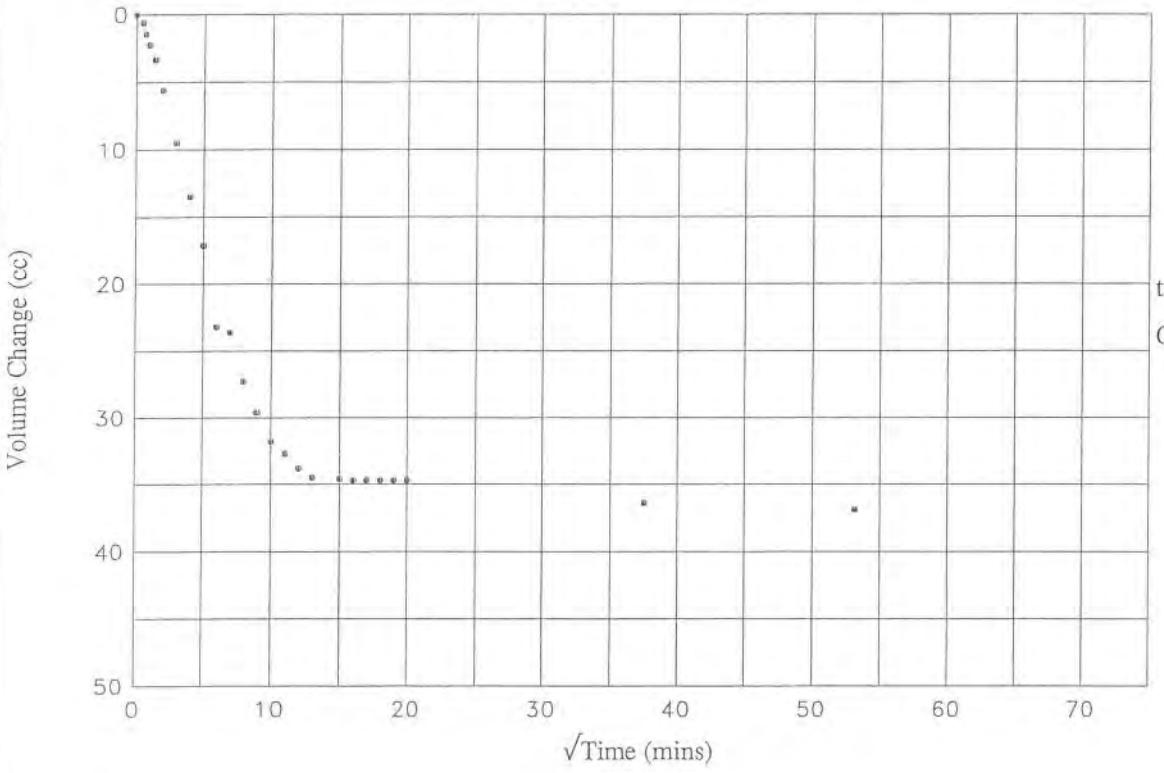
Figure

Form 28/1

Stage = 3 Applied Load = 50 - 100 kN/m²



d_{100} = 37.900 cc
d_0 = .000 cc
d_{50} = 18.950 cc
t_{50} = 27.92 mins
C_V = 1.52 m²/year



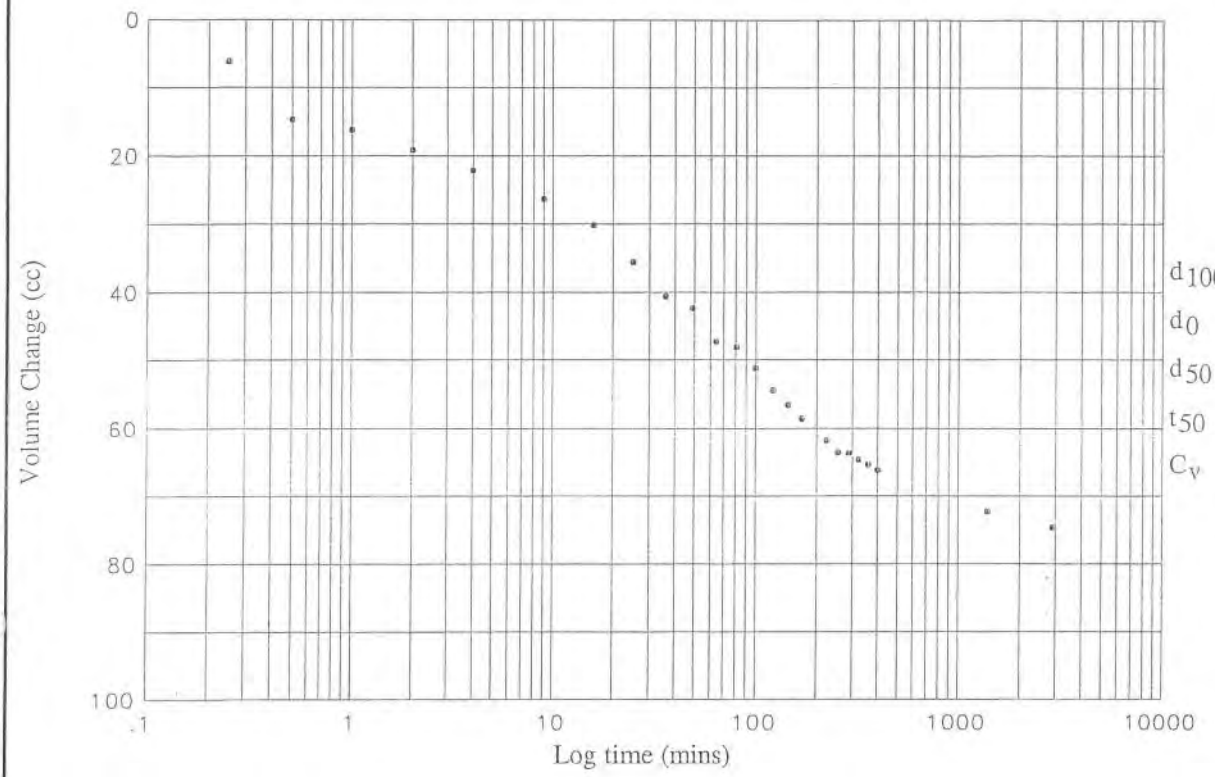
t_{90} = 122.39 mins
C_V = 1.48 m²/year

Initial Volume = 341.894 cc
Volume Change = 36.900 cc
Final Volume = 304.994 cc

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 2

Applied Load = 25 - 50 kN/m²



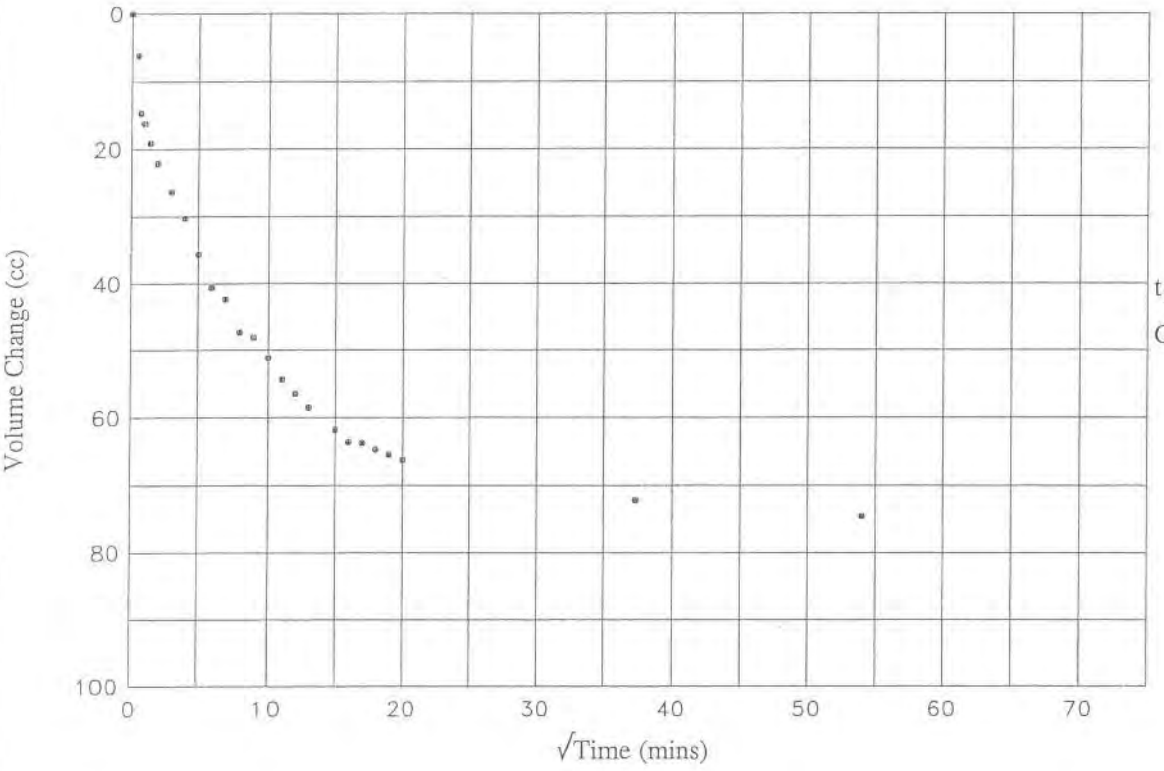
d_{100} = 86.933 cc

d_0 = .000 cc

d_{50} = 43.467 cc

t_{50} = 52.15 mins

C_v = 1.10 m²/year



t_{90} = 210.54 mins

C_v = 1.16 m²/year

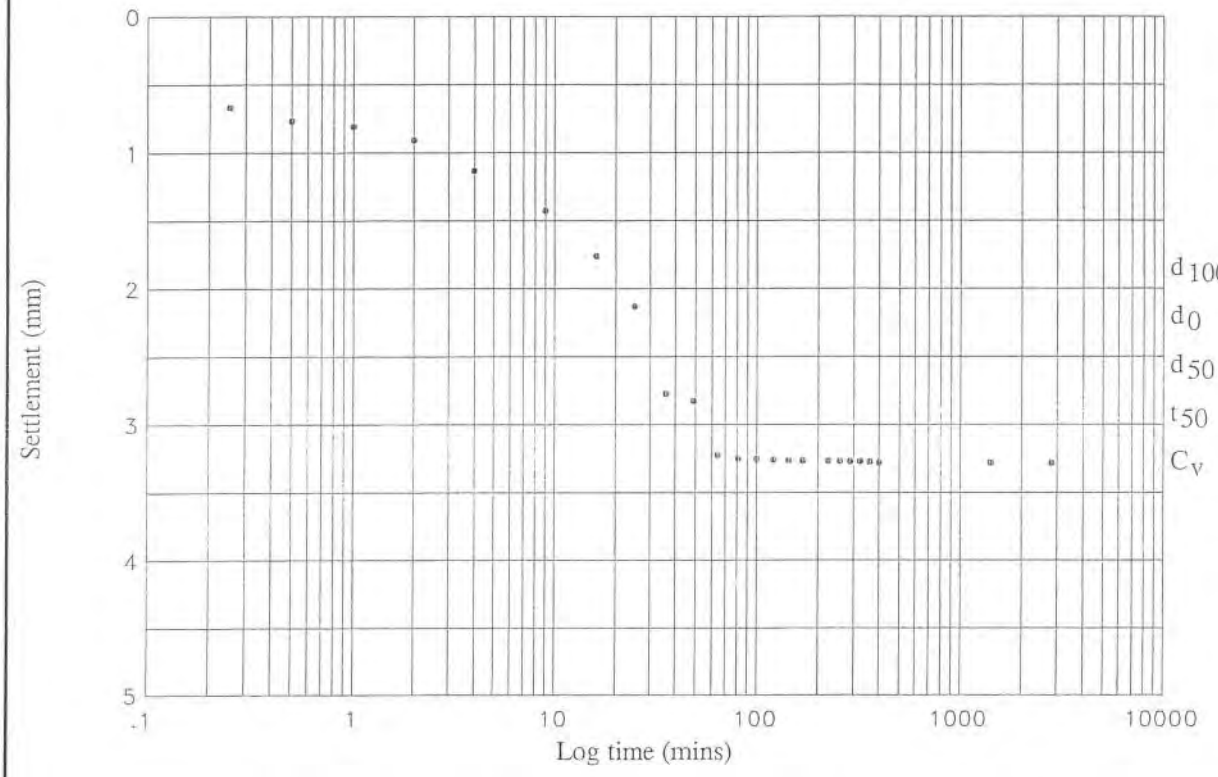
Initial Volume = 419.032 cc

Volume Change = 74.600 cc

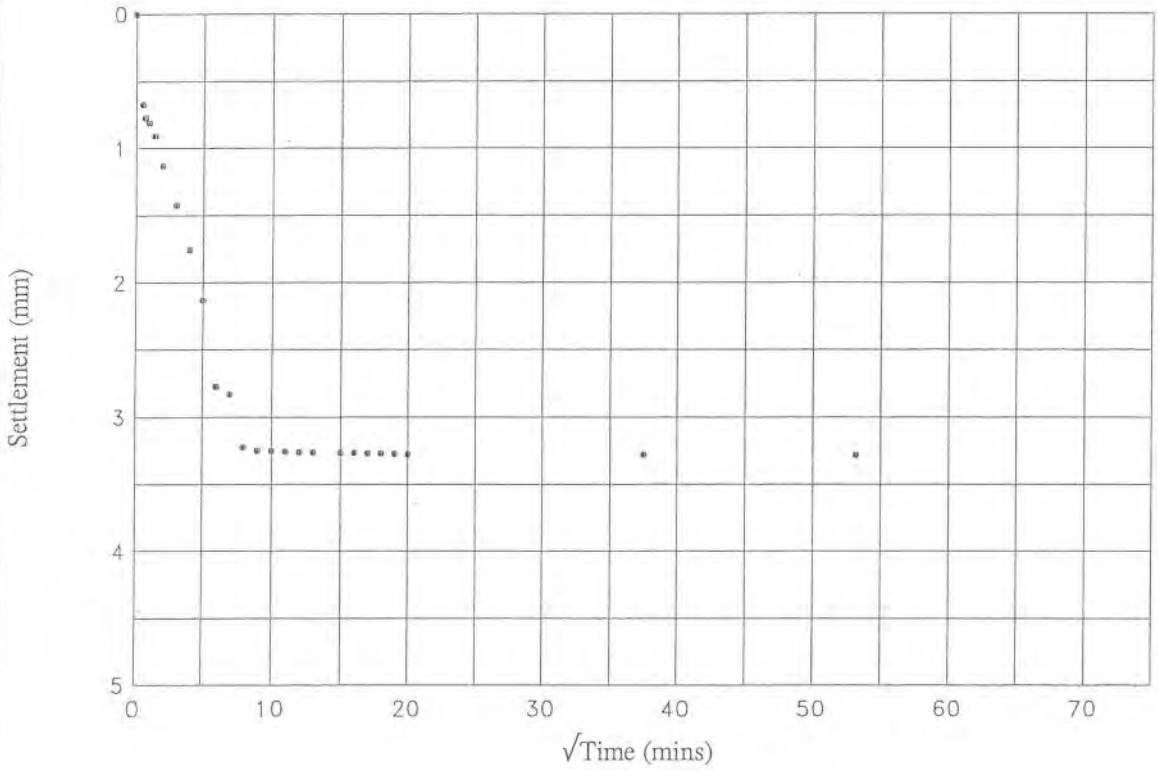
Final Volume = 344.432 cc

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 3 Applied Load = 50 - 100 kN/m²



d_{100} = 2.951 mm
d_0 = .528 mm
d_{50} = 1.739 mm
t_{50} = 15.49 mins
C_v = 2.74 m²/year



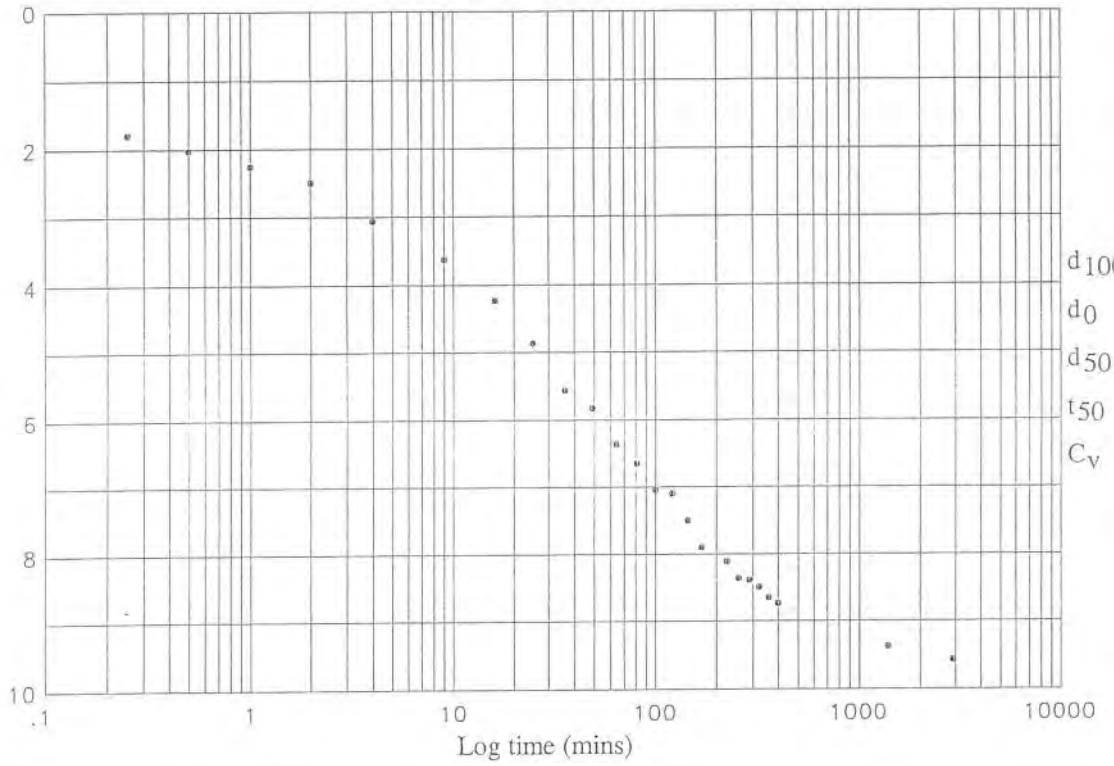
t_{90} = 72.07 mins
C_v = 2.51 m²/year

Initial Height = 41.860 mm
Height Change = 3.284 mm
Final Height = 38.576 mm

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 2

Applied Load = 25 - 50 kN/m²



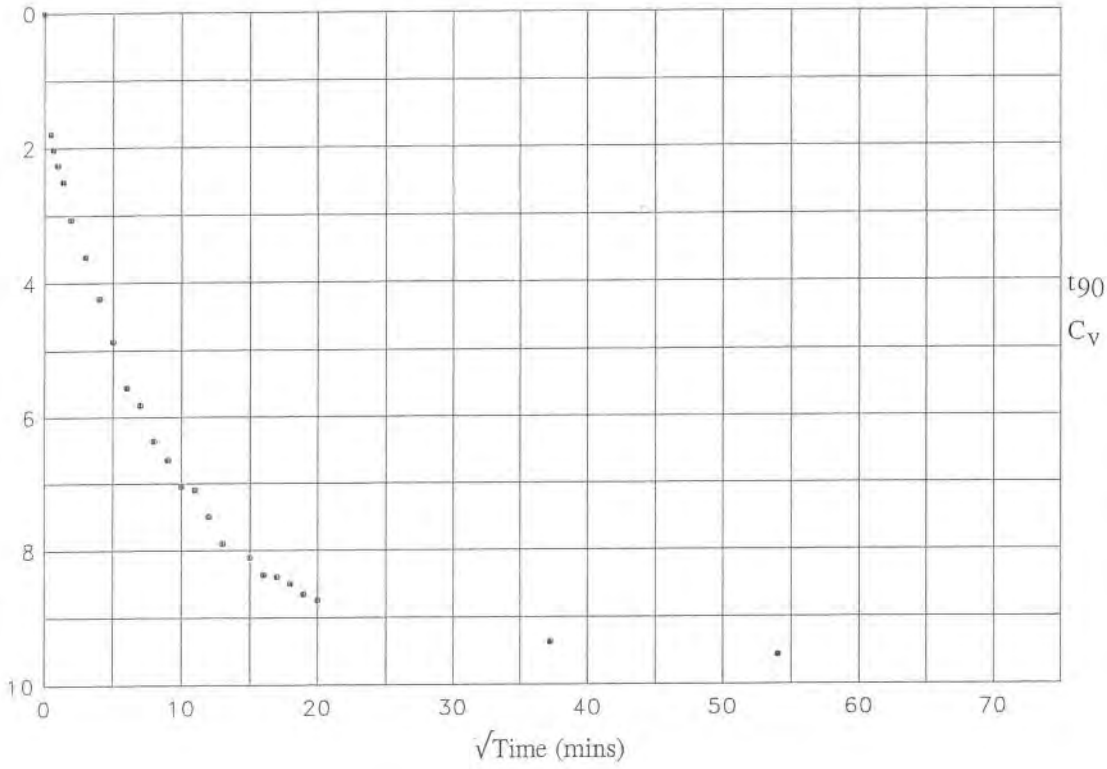
d_{100} = 9.133 mm

d_0 = 1.332 mm

d_{50} = 5.232 mm

t_{50} = 30.32 mins

C_v = 1.89 m²/year



t_{90} = 135.46 mins

C_v = 1.81 m²/year

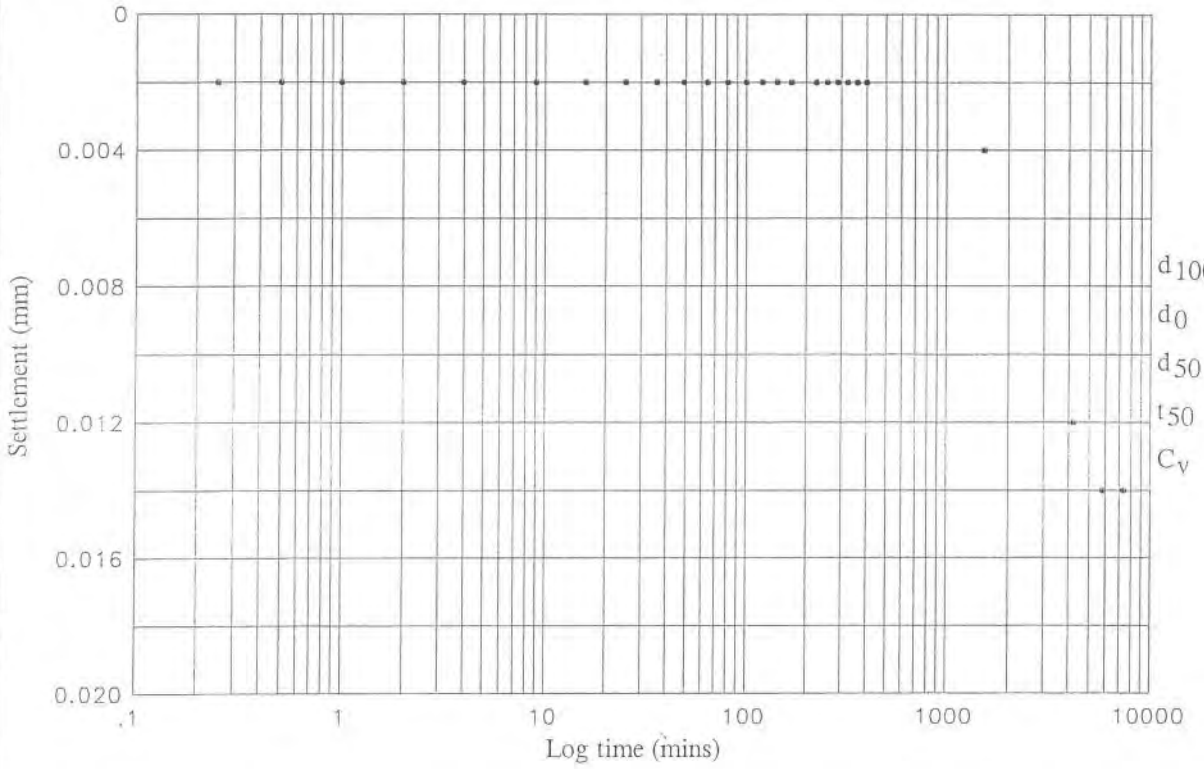
Initial Height = 51.732 mm

Height Change = 9.566 mm

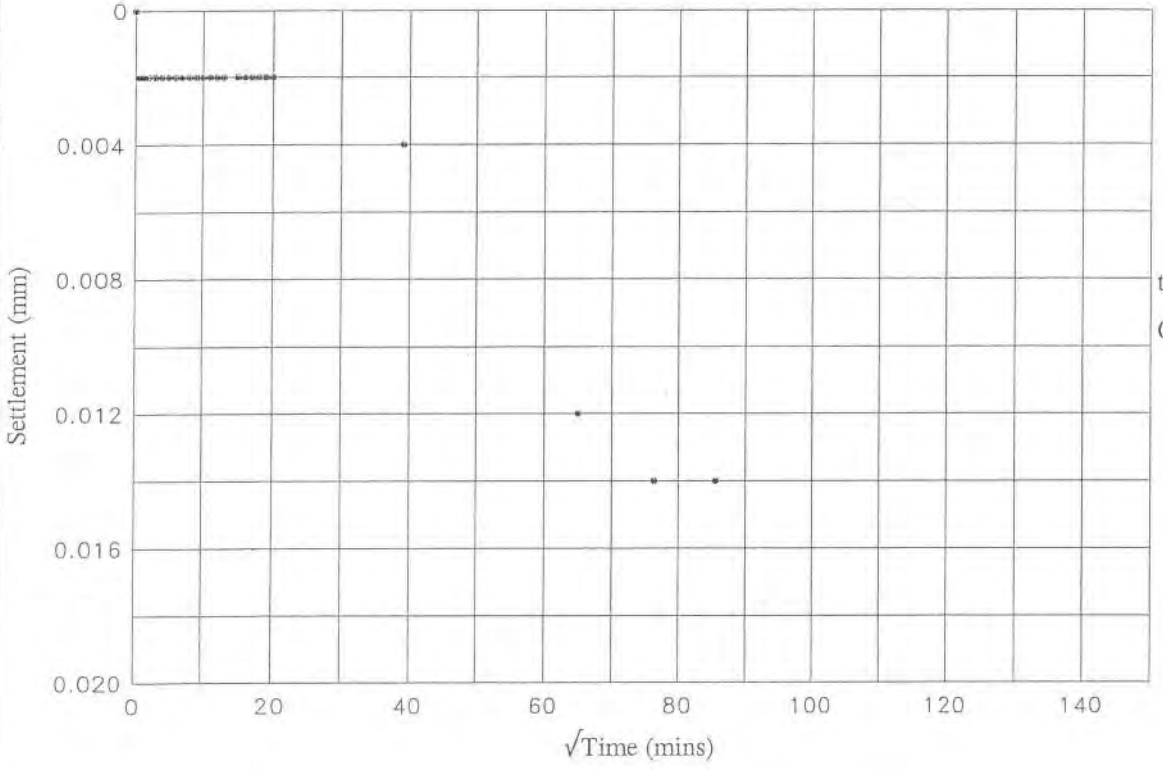
Final Height = 42.166 mm

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 4 Applied Load = 100 - 50 kN/m²



d_{100} = .000 mm
d_0 = .000 mm
d_{50} = .000 mm
t_{50} = .00 mins
C_v = .00 m²/year



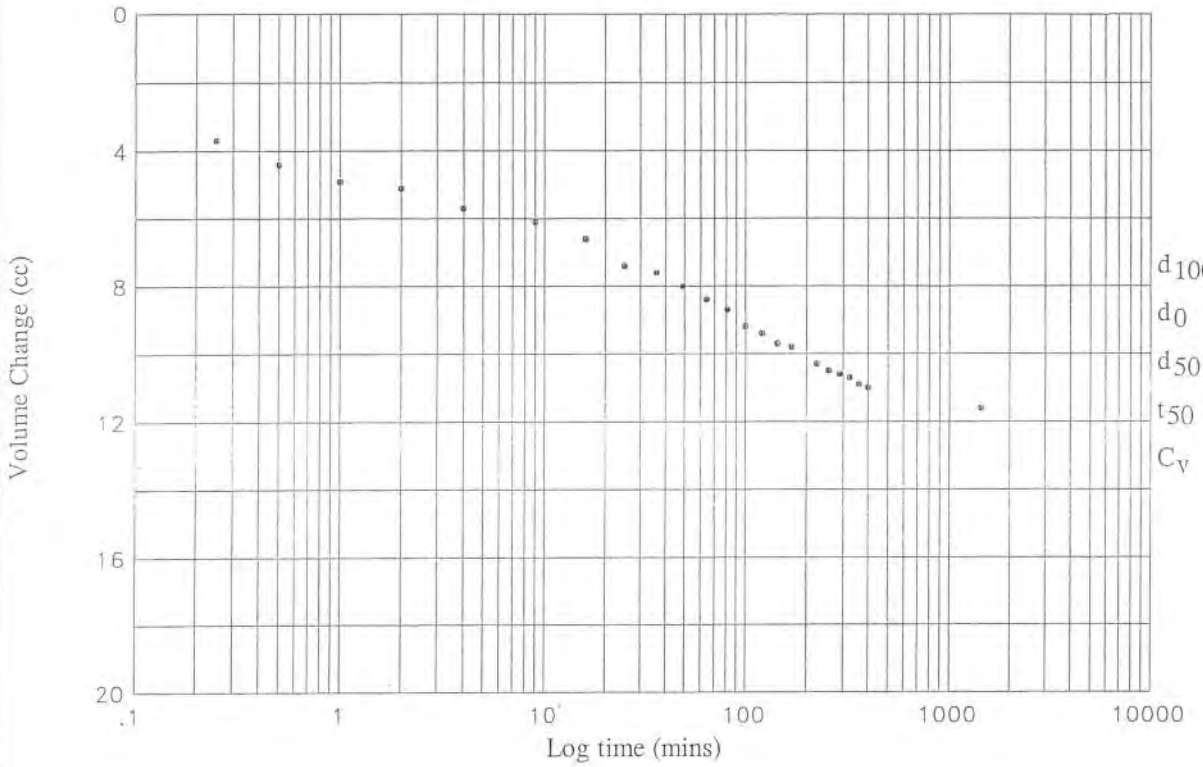
t_{90} = .00 mins
C_v = .00 m²/year

Initial Height = 38.580 mm
Height Change = -.014 mm
Final Height = 38.594 mm

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 1

Applied Load = 0 - 25 kN/m²



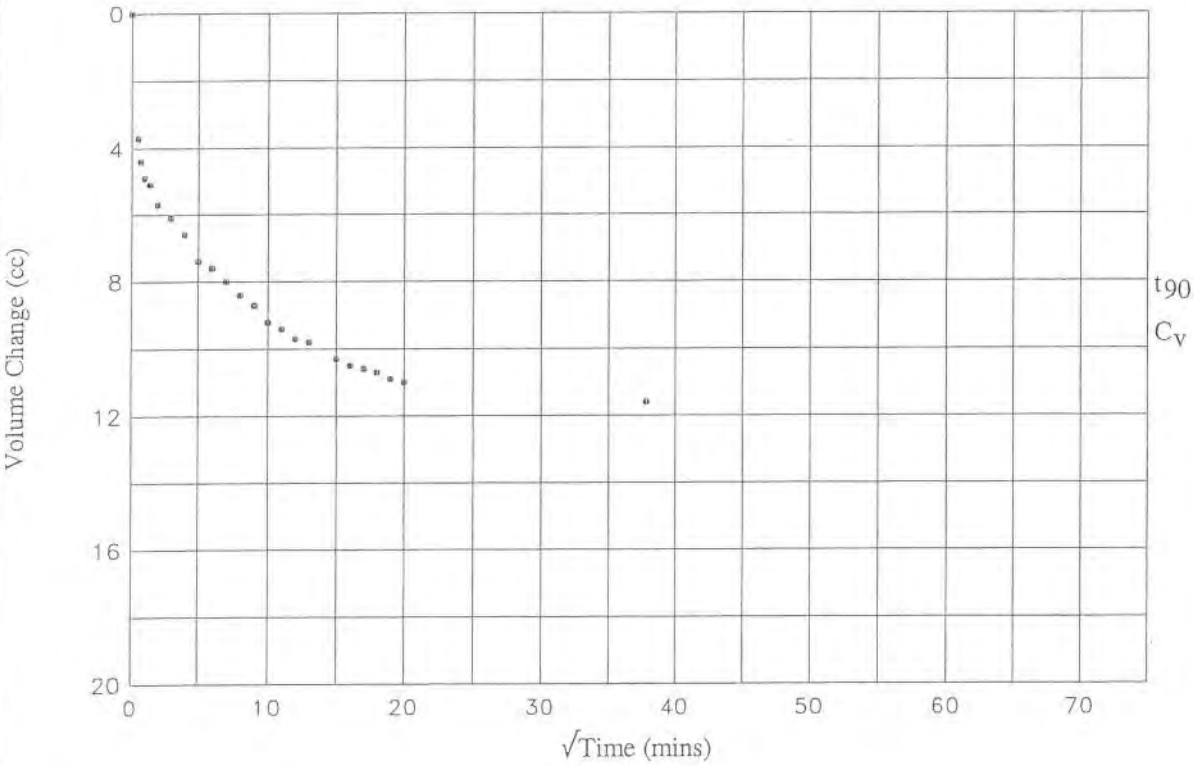
d_{100} = 12.667 cc

d_0 = 2.500 cc

d_{50} = 7.583 cc

t_{50} = 34.92 mins

C_v = 2.00 m²/year



t_{90} = 156.51 mins

C_v = 1.91 m²/year

Initial Volume = 430.897 cc

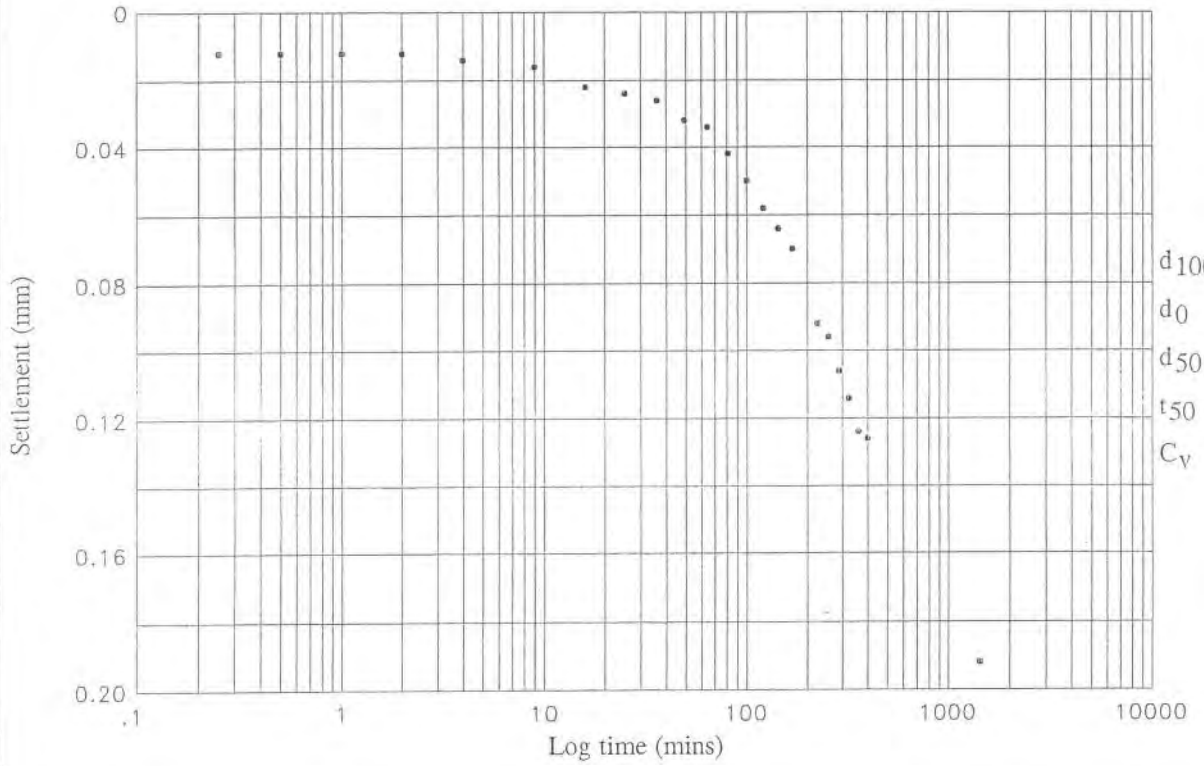
Volume Change = 11.600 cc

Final Volume = 419.297 cc

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

Stage = 1

Applied Load = 0 - 25 kN/m²



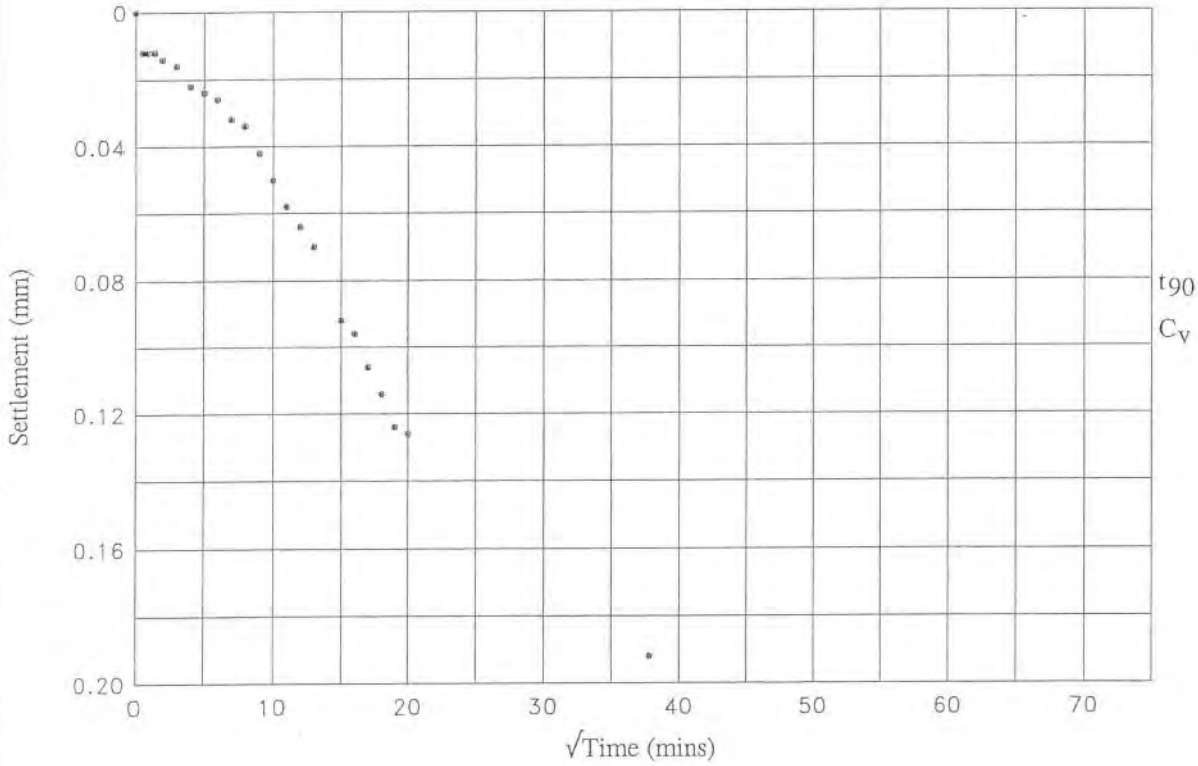
d_{100} = .127 mm

d_0 = .012 mm

d_{50} = .070 mm

t_{50} = 167.50 mins

C_v = .42 m²/year



t_{90} = 708.67 mins

C_v = .42 m²/year

Initial Height = 51.956 mm

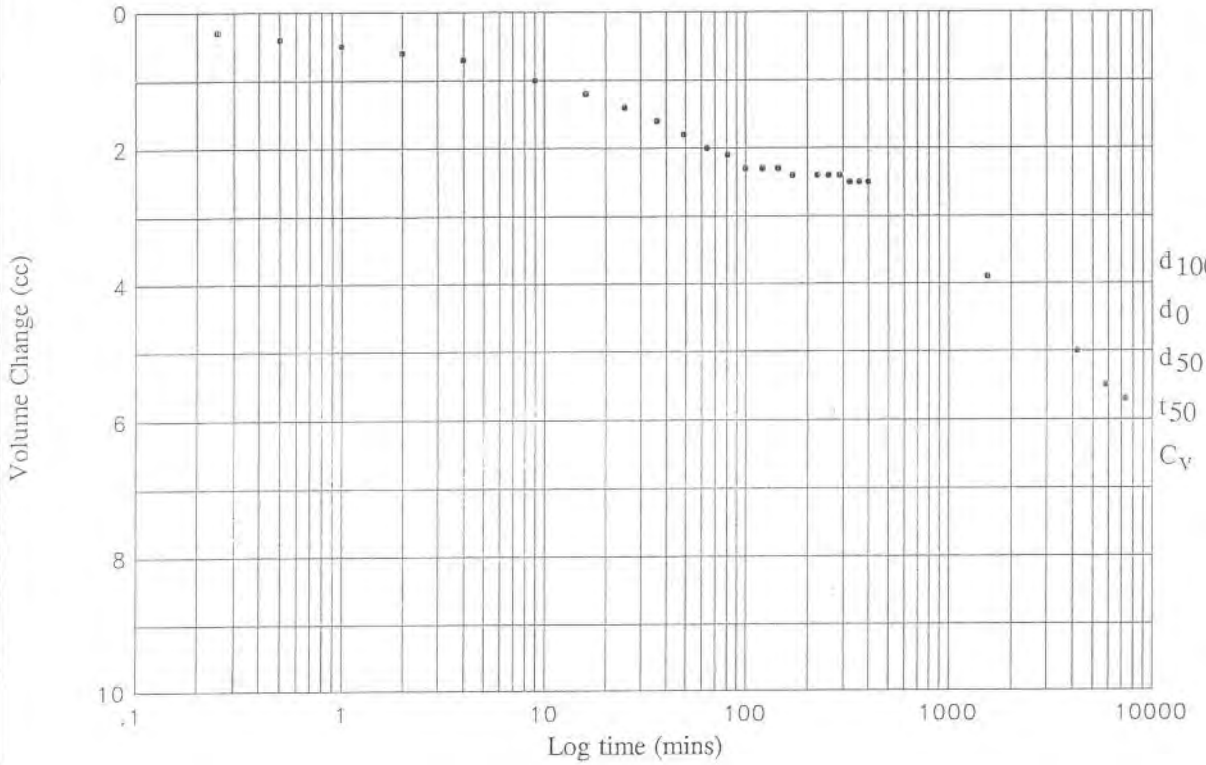
Height Change = .192 mm

Final Height = 51.764 mm

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/1

Stage = 4

Applied Load = 100 - 50 kN/m²



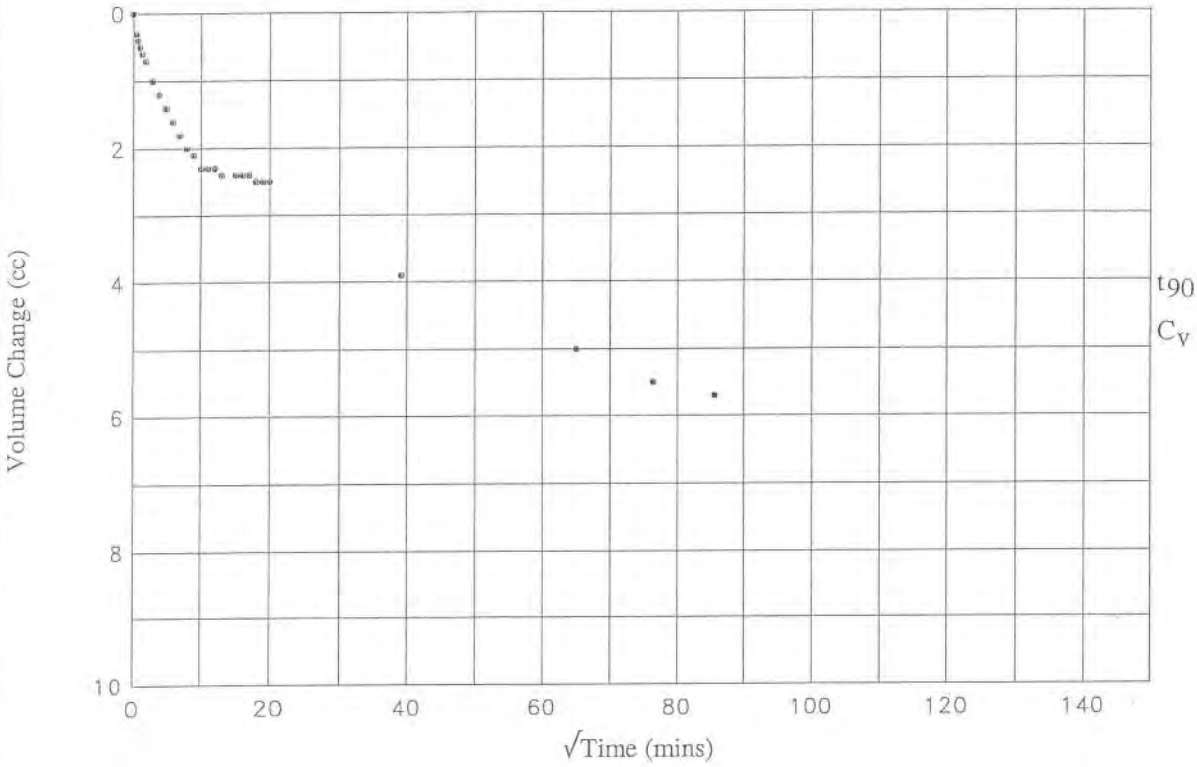
d_{100} = 4.533 cc

d_0 = .100 cc

d_{50} = 2.317 cc

t_{50} = 147.89 mins

C_V = .26 m²/year



t_{90} = 530.62 mins

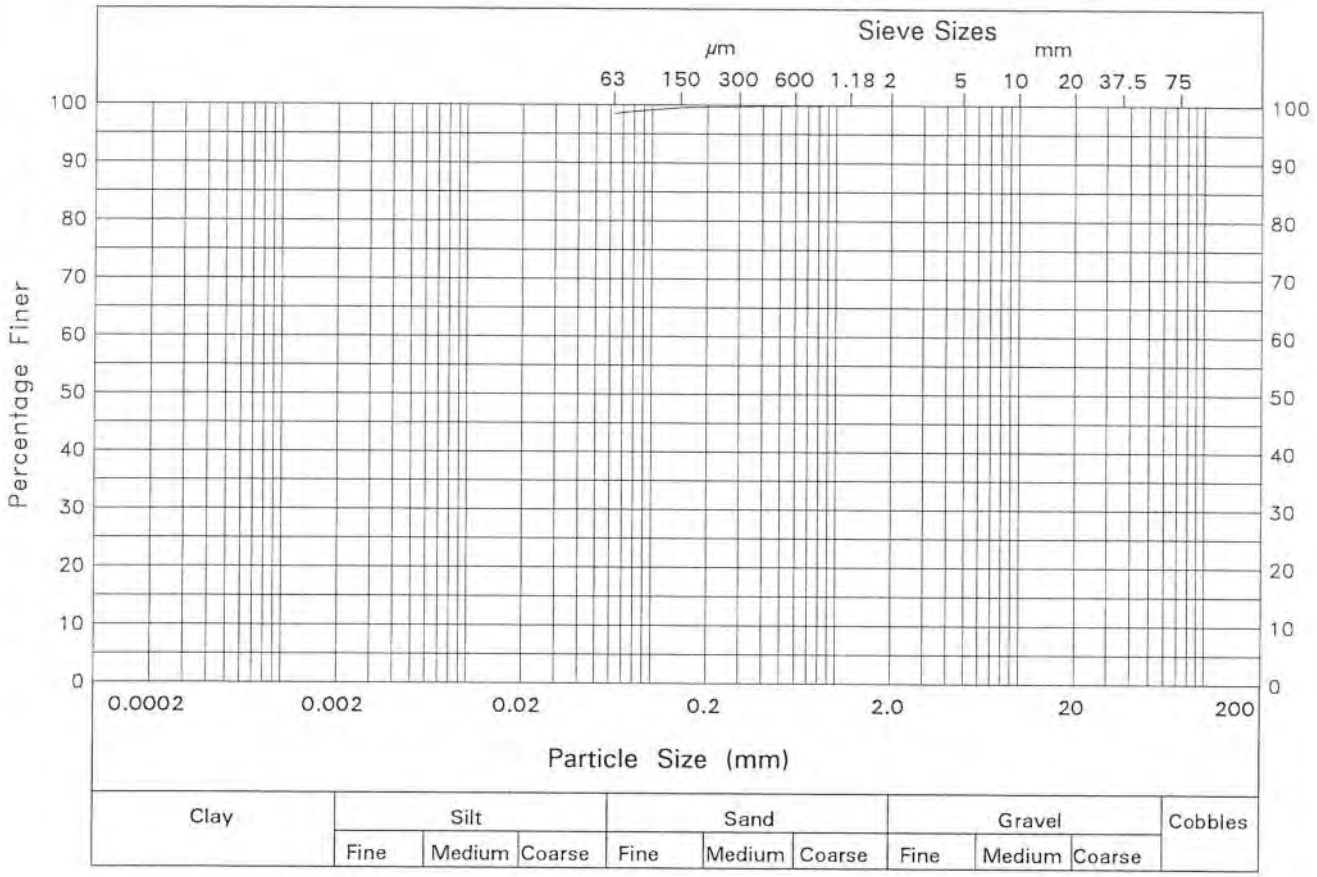
C_V = .31 m²/year

Initial Volume = 305.027 cc

Volume Change = -5.7 cc

Final Volume = 310.727 cc

Remarks		Depth 3.50 - 4.50 m Borehole 110
Laboratory - Hydraulic Cell Consolidation Test	Project N6 Galway	Contract KC3210
Exploration Associates		Form 213/0

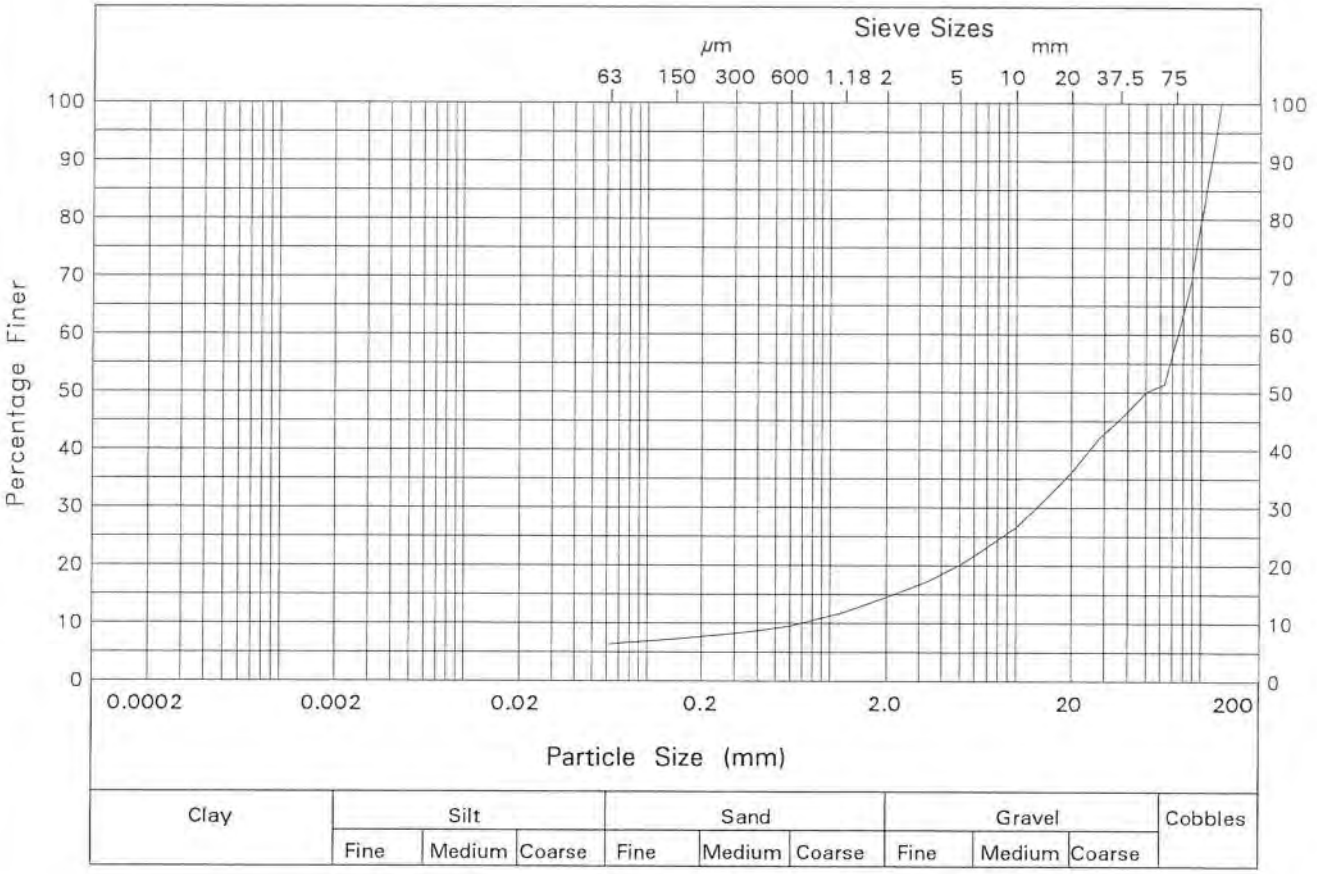


Particle Size	% Passing	Particle Size	% Passing
2 mm	100		
1.18 mm	100		
600 μm	100		
425 μm	100		
300 μm	100		
212 μm	100		
150 μm	100		
75 μm	99		
63 μm	98		

Hole BH39	Description SILT with rare sand
Depth 3.50 -4.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
90 mm	70	2 mm	15
75 mm	60	1.18 mm	12
63 mm	51	600 μm	10
50 mm	50	425 μm	9
37.5 mm	46	300 μm	8
28 mm	42	212 μm	8
20 mm	36	150 μm	7
14 mm	31	75 μm	7
10 mm	27	63 μm	6
6.3 mm	22		
5 mm	20		
3.35 mm	17		

Hole BH41	Description Clayey sandy GRAVEL
Depth 2.50 -3.00	
Type B	
Test Performed Wet	Uniformity Coefficient = 125

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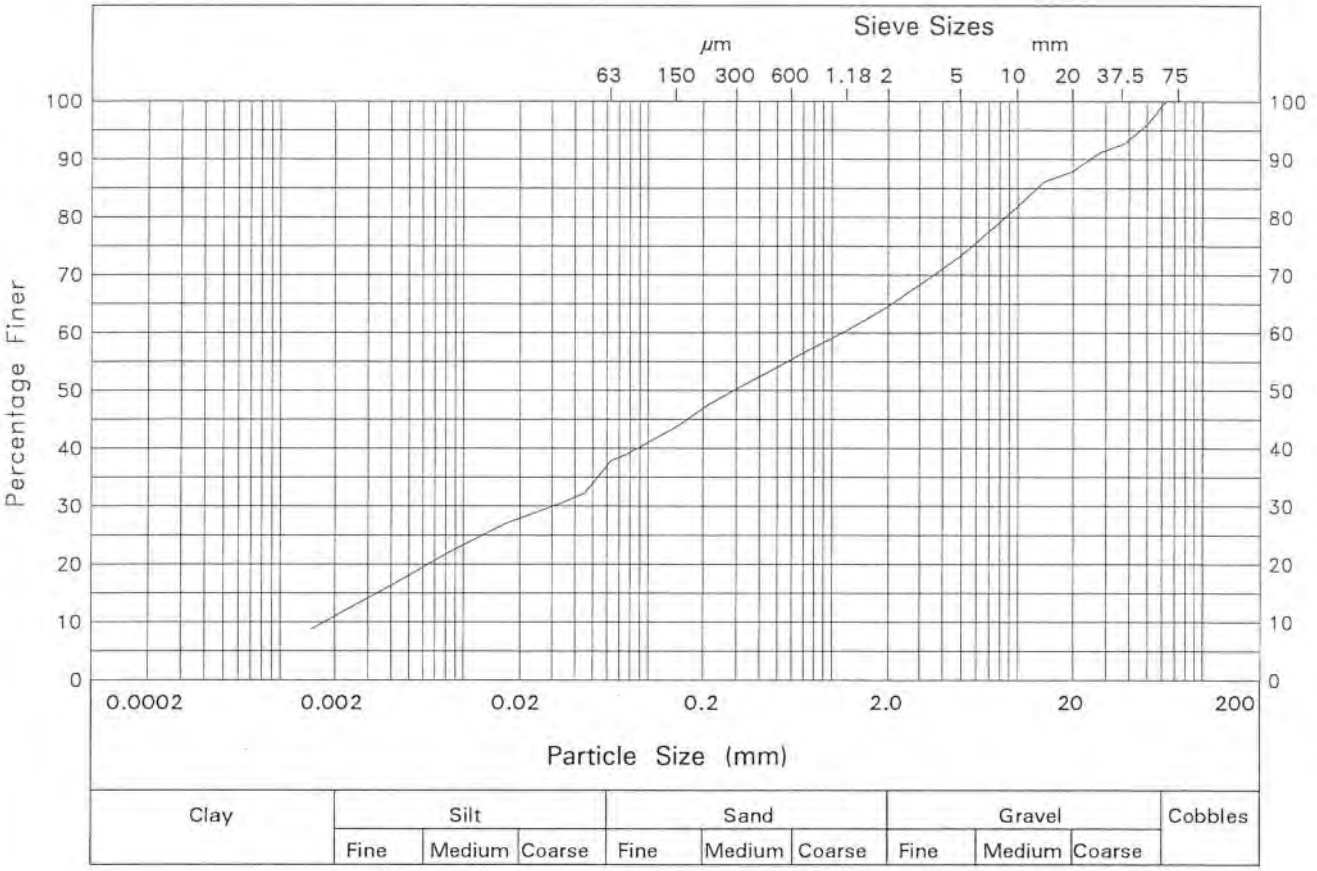
Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

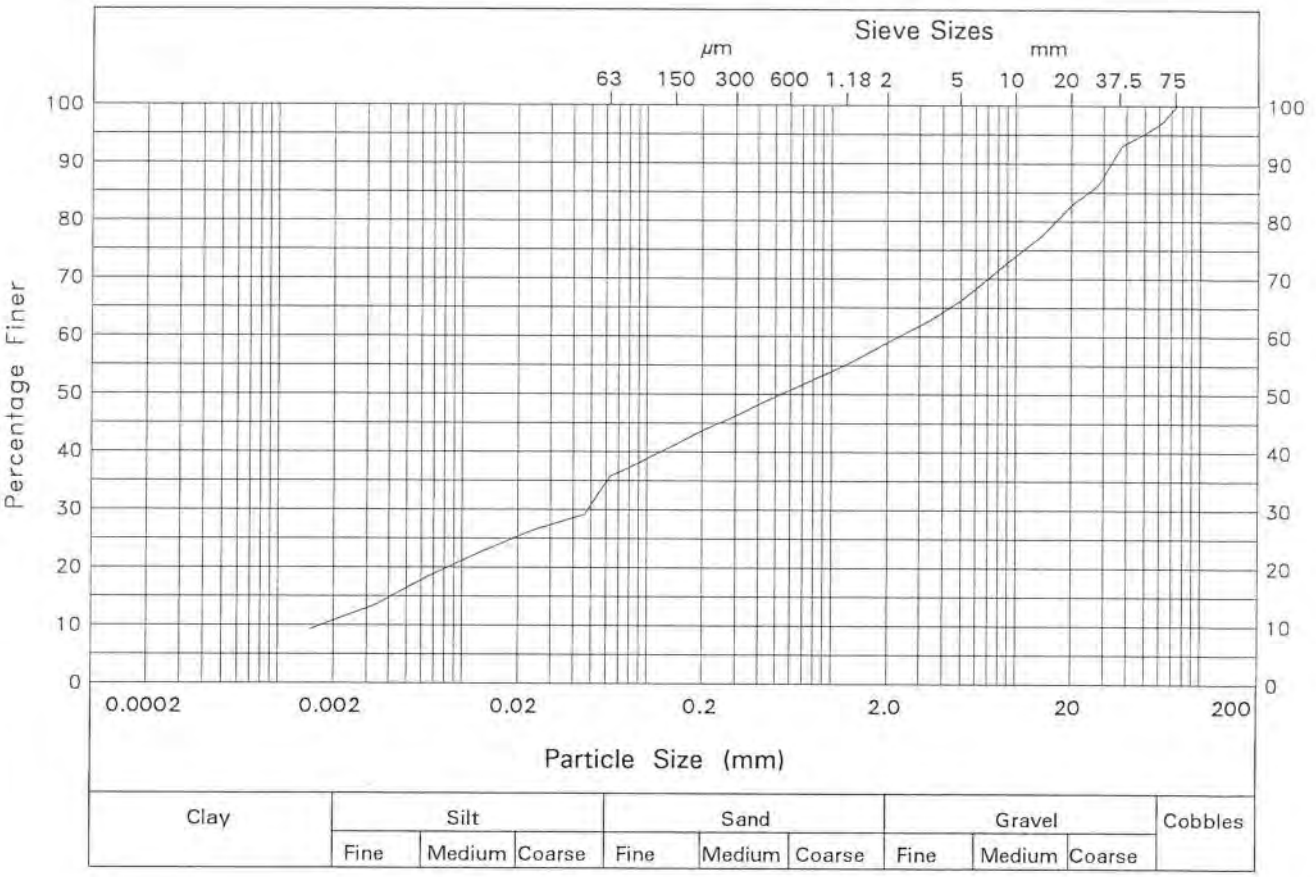


Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	55
50 mm	96	425 μm	53
37.5 mm	93	300 μm	50
28 mm	91	212 μm	47
20 mm	88	150 μm	44
14 mm	86	75 μm	39
10 mm	82	63 μm	38
6.3 mm	76	45 μm	32
5 mm	73	35 μm	31
3.35 mm	69	17 μm	27
2 mm	65		
1.18 mm	60		

Hole BH44	Description Slightly sandy slightly gravelly to gravelly CLAY
Depth 0.50 -1.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

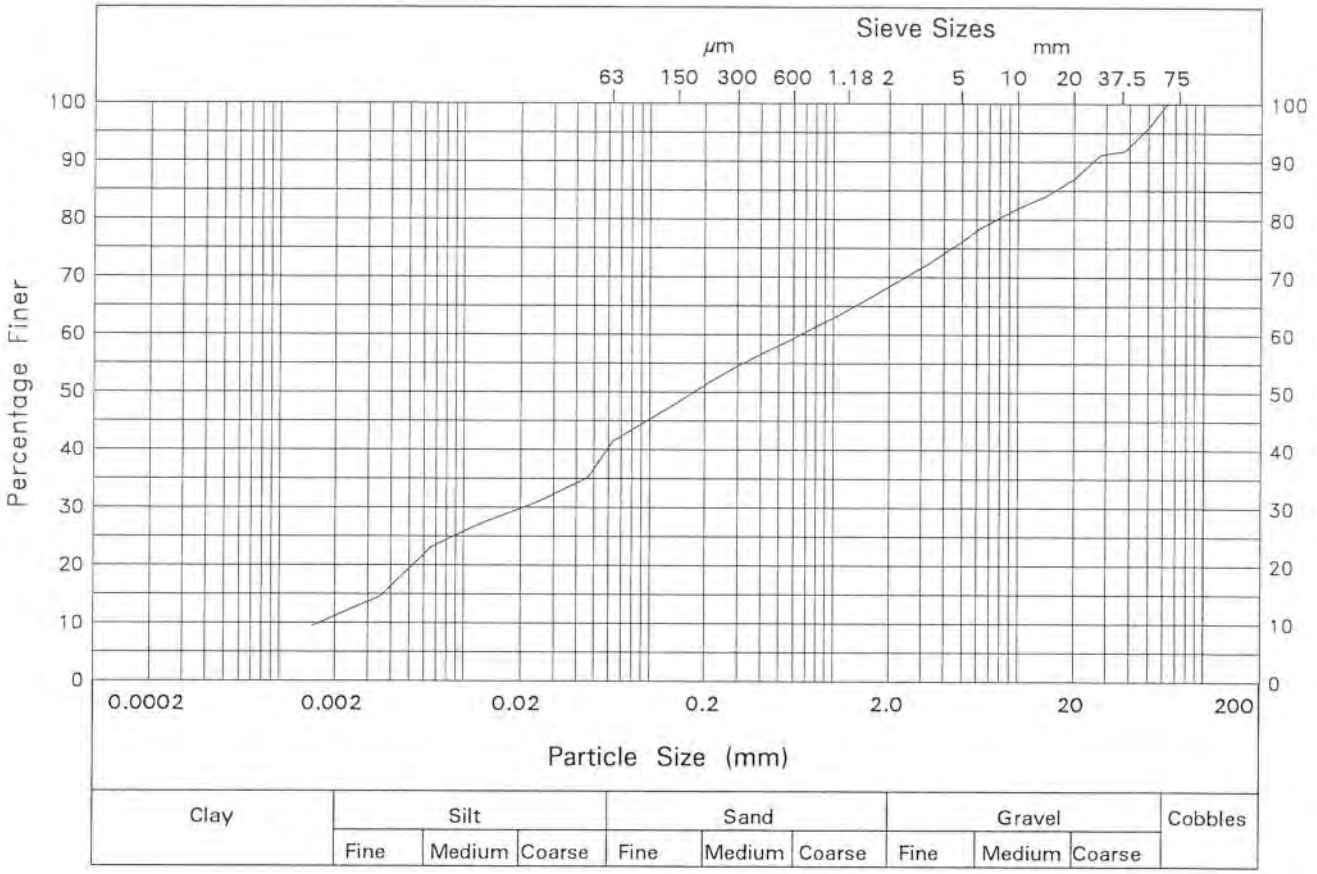


Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	55
63 mm	97	600 μm	51
50 mm	95	425 μm	49
37.5 mm	93	300 μm	46
28 mm	86	212 μm	44
20 mm	83	150 μm	42
14 mm	78	75 μm	37
10 mm	74	63 μm	36
6.3 mm	69	46 μm	29
5 mm	66	24 μm	26
3.35 mm	63	13 μm	23
2 mm	59		

Hole BH50	Description: Slightly sandy gravelly CLAY
Depth 1.50 -2.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	59
50 mm	96	425 μm	57
37.5 mm	92	300 μm	54
28 mm	91	212 μm	52
20 mm	87	150 μm	49
14 mm	84	75 μm	43
10 mm	82	63 μm	41
6.3 mm	79	46 μm	35
5 mm	76	24 μm	31
3.35 mm	72	13 μm	27
2 mm	68		
1.18 mm	64		

Hole BH53	Description: Slightly sandy slightly gravelly CLAY
Depth 0.50 -0.95	
Type U	
Test Performed Wet	Uniformity Coefficient not applicable.

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Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

Particle Size Distribution Analysis

Project No	KC3210	Sample Details:	Hole No	BH55A
Project Name	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough		Depth (m BGL)	2.00
			No	
			Type	B
			ID	ESGN500077642

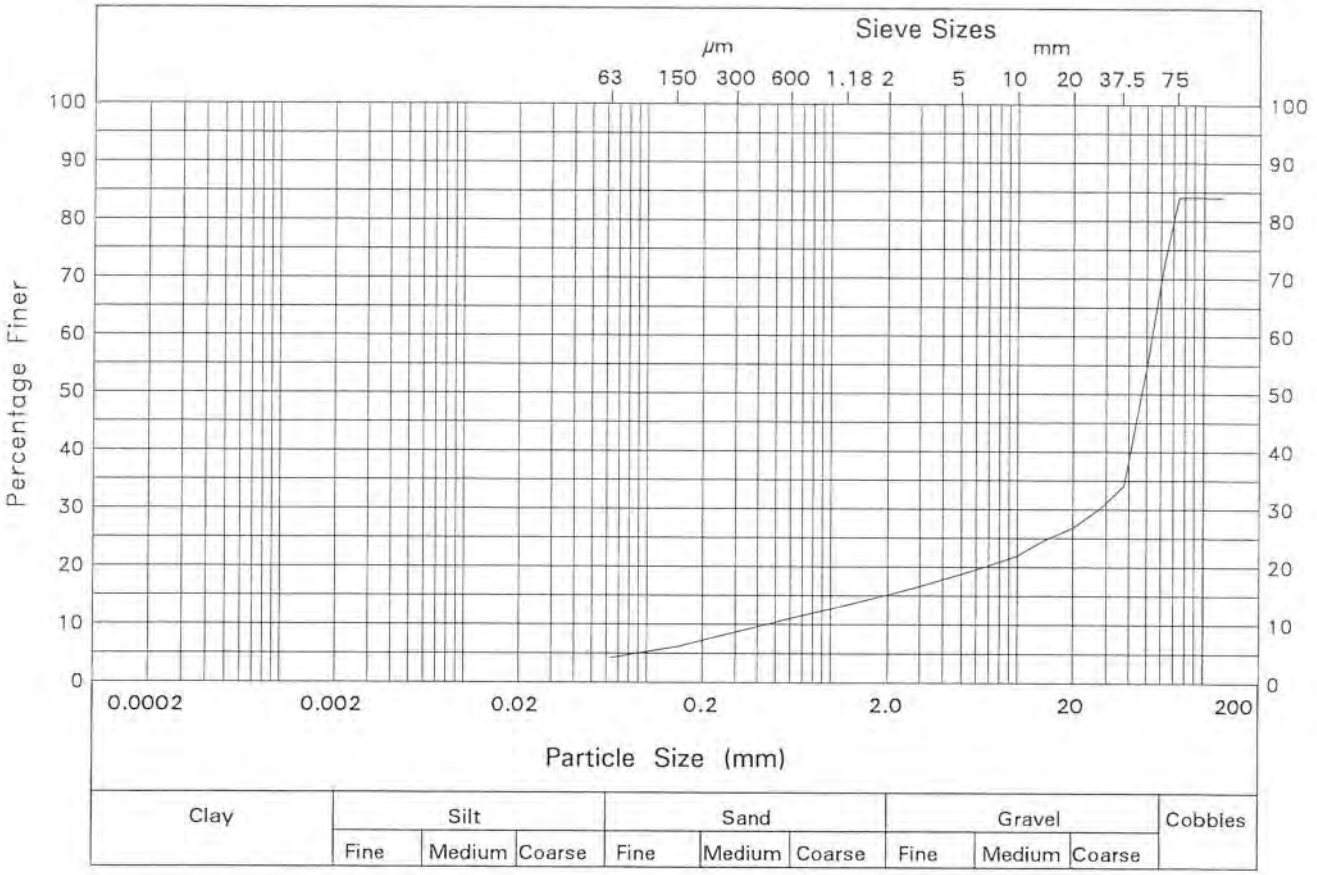
Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.0630	31
63	100	0.0488	29
50	96	0.0351	27
37.5	92	0.0251	26
28	90	0.0180	24
20	85	0.0096	20
14	81	0.0050	14
10	78	0.0036	12
6.3	73	0.0016	8
5.0	71		
3.35	68		
2.00	63		
1.18	58		
0.600	52		
0.425	49	Particle density, Mg/m3	
0.300	46	2.65 assumed	
0.212	43	Dry mass of sample, kg	
0.150	39	9.4	
0.063	31		

Soil description	Grey sandy gravelly CLAY. Gravel is fine to coarse. Sand is fine to medium.	
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377	
Remarks		
Sample Proportions	Cobbles / boulders	1
	Gravel	36
	Sand	32
	Silt	22
	Clay	9

Uniformity Coefficient	D_{60} / D_{10}	638

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

Ref SLR 2.9 Rev 1 MAY 02	Soil Mechanics	UKAS TESTING 1157	Approved		Date	12.2.04



Particle Size	% Passing	Particle Size	% Passing
90 mm	84	2 mm	15
75 mm	84	1.18 mm	13
63 mm	73	600 μm	11
50 mm	54	425 μm	10
37.5 mm	34	300 μm	9
28 mm	30	212 μm	7
20 mm	27	150 μm	6
14 mm	25	75 μm	5
10 mm	22	63 μm	4
6.3 mm	20		
5 mm	19		
3.35 mm	17		

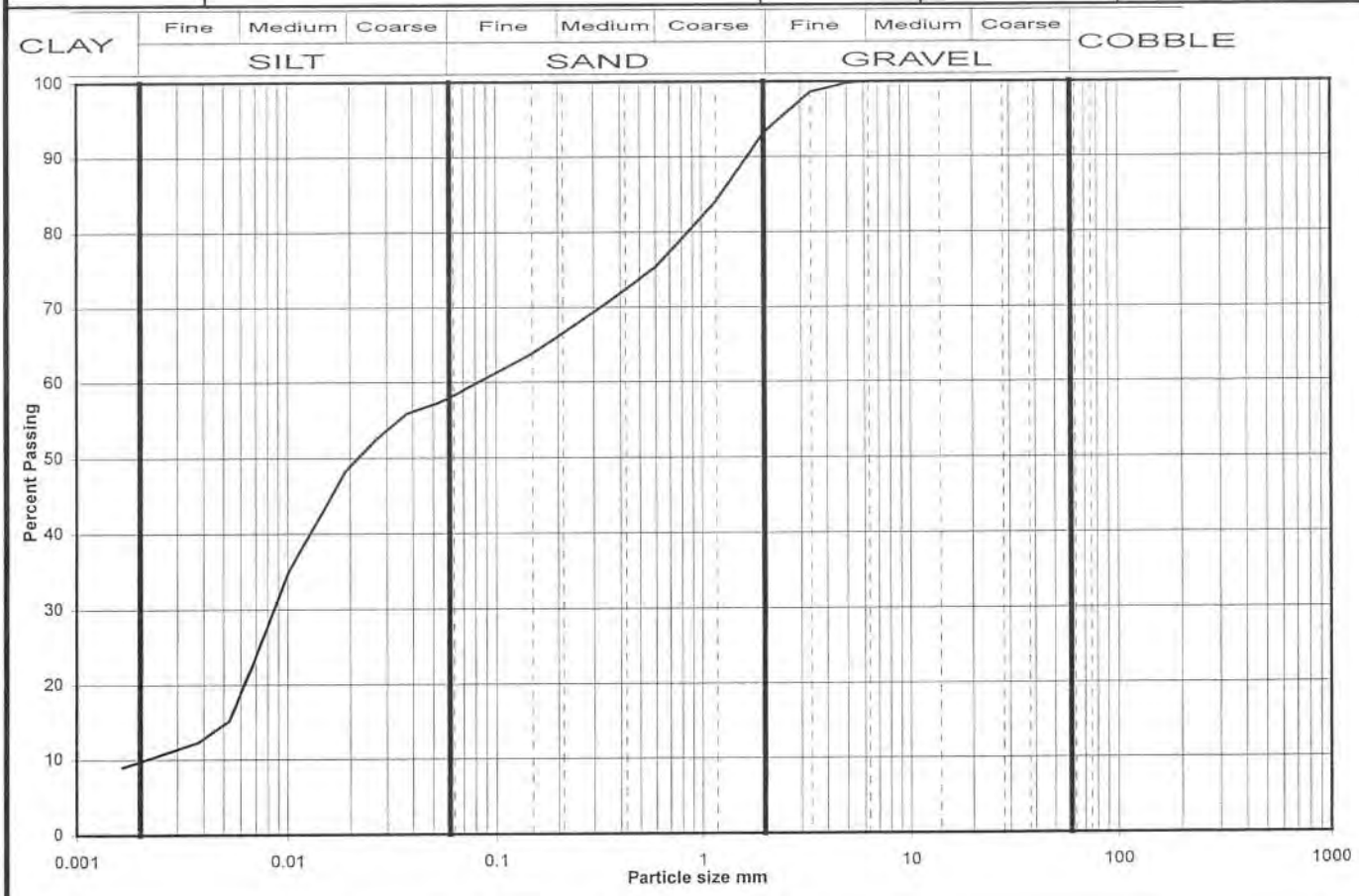
Hole BH64	Description Slightly silty sandy GRAVEL
Depth 1.50 -2.00	
Type B	
Test Performed Wet	Uniformity Coefficient = 127

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

Particle Size Distribution Analysis

Project No	KC3210	Sample Details:	Hole No	BH110
Project Name	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough		Depth (m BGL)	3.50 - 4.50
			No	11
			Type	P
			ID	ESGN500077149



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.0630	58
63	100	0.0528	57
50	100	0.0375	56
37.5	100	0.0267	53
28	100	0.0191	48
20	100	0.0102	35
14	100	0.0053	15
10	100	0.0038	12
6.3	100	0.0017	9
5.0	100		
3.35	99		
2.00	93		
1.18	84		
0.600	75		
0.425	72	Particle density, Mg/m3	
0.300	69	2.65 assumed	
0.212	67	Dry mass of sample, kg	
0.150	64	0.7	
0.063	58		

Soil description	Soft brownish grey organic CLAY with fine rootlets and plant remains.	
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377	
Remarks		
Sample Proportions	Cobbles / boulders	0
	Gravel	7
	Sand	35
	Silt	48
	Clay	10

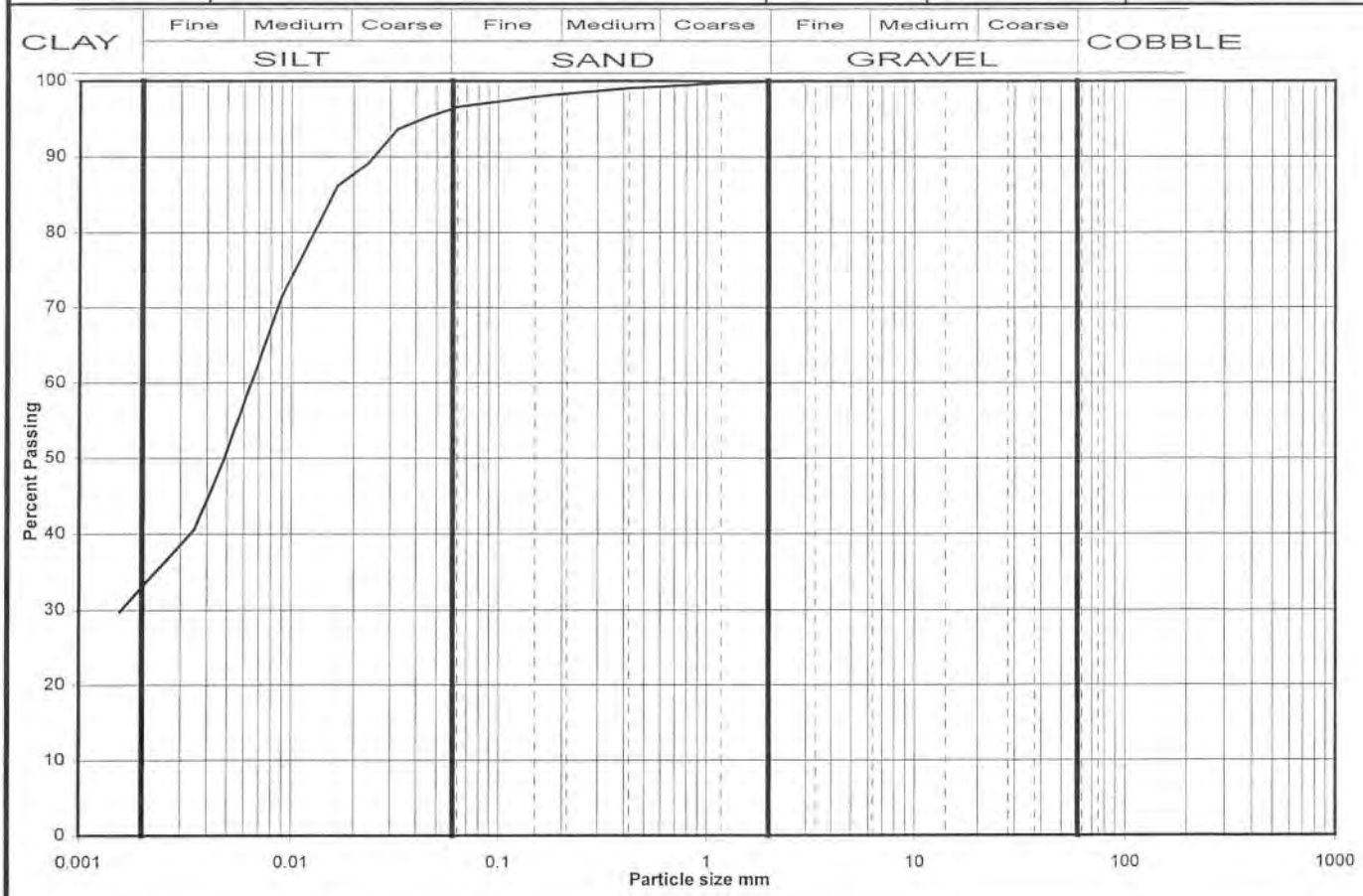
Uniformity Coefficient	D_{60} / D_{10}	39

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

Ref SLR 2.9 Rev 1 MAY 02	Soil Mechanics	UKAS TESTING 1157	Approved		Date	23-1-04

Particle Size Distribution Analysis

Project No	KC3210	Sample Details:	Hole No	BH110
Project Name	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough		Depth (m BGL)	6.50 - 7.50
			No	16
			Type	P
			ID	ESGN500077151

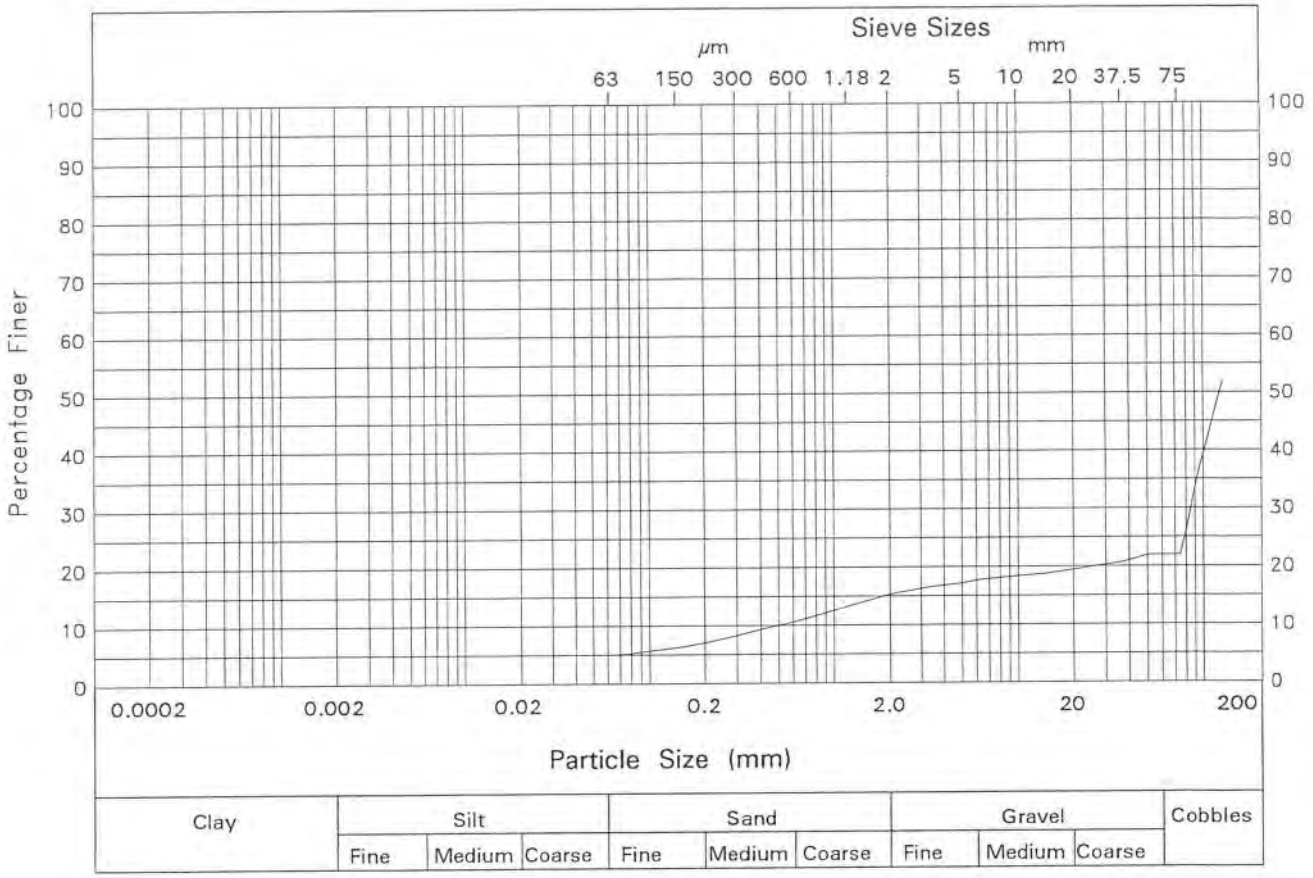


Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.0630	97
63	100	0.0458	95
50	100	0.0326	94
37.5	100	0.0234	89
28	100	0.0167	86
20	100	0.0091	72
14	100	0.0048	50
10	100	0.0035	41
6.3	100	0.0016	30
5.0	100		
3.35	100		
2.00	100		
1.18	100		
0.600	99		
0.425	99	Particle density, Mg/m3	
0.300	99	2.65 assumed	
0.212	98	Dry mass of sample, kg	
0.150	98	1.6	
0.063	97		

Soil description	Soft uncompact light grey slightly clayey SILT.	
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377	
Remarks		
Sample Proportions	Cobbles / boulders	0
	Gravel	0
	Sand	4
	Silt	63
	Clay	33

Uniformity Coefficient	D_{60} / D_{10}	#N/A

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

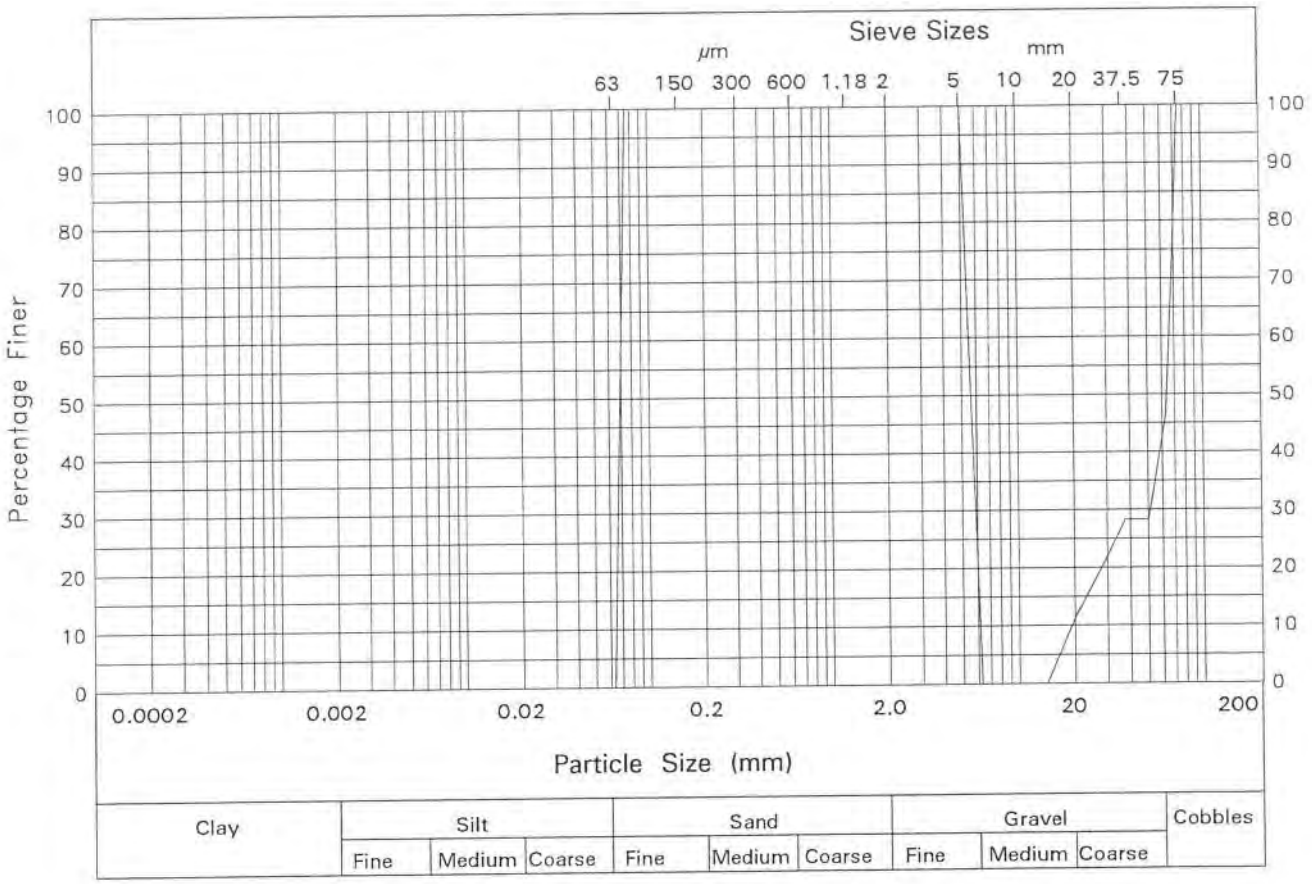


Particle Size	% Passing	Particle Size	% Passing
90 mm	34	2 mm	15
75 mm	22	1.18 mm	13
63 mm	22	600 μm	11
50 mm	22	425 μm	10
37.5 mm	21	300 μm	8
28 mm	20	212 μm	7
20 mm	19	150 μm	6
14 mm	19	75 μm	5
10 mm	18	63 μm	5
6.3 mm	18		
5 mm	17		
3.35 mm	17		

Hole BH114	Description Silty sandy GRAVEL
Depth 0.20 -0.60	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	0
63 mm	47	600 µm	0
50 mm	28	425 µm	0
37.5 mm	28	300 µm	0
28 mm	20	212 µm	0
20 mm	11	150 µm	0
14 mm	0	75 µm	0
10 mm	0	63 µm	0
6.3 mm	0		
5 mm	0		
3.35 mm	0		
2 mm	0		

Hole BH145A	Description GRAVEL
Depth 0.50 -1.00	
Type B	
Test Performed Dry	Uniformity Coefficient = 3.4

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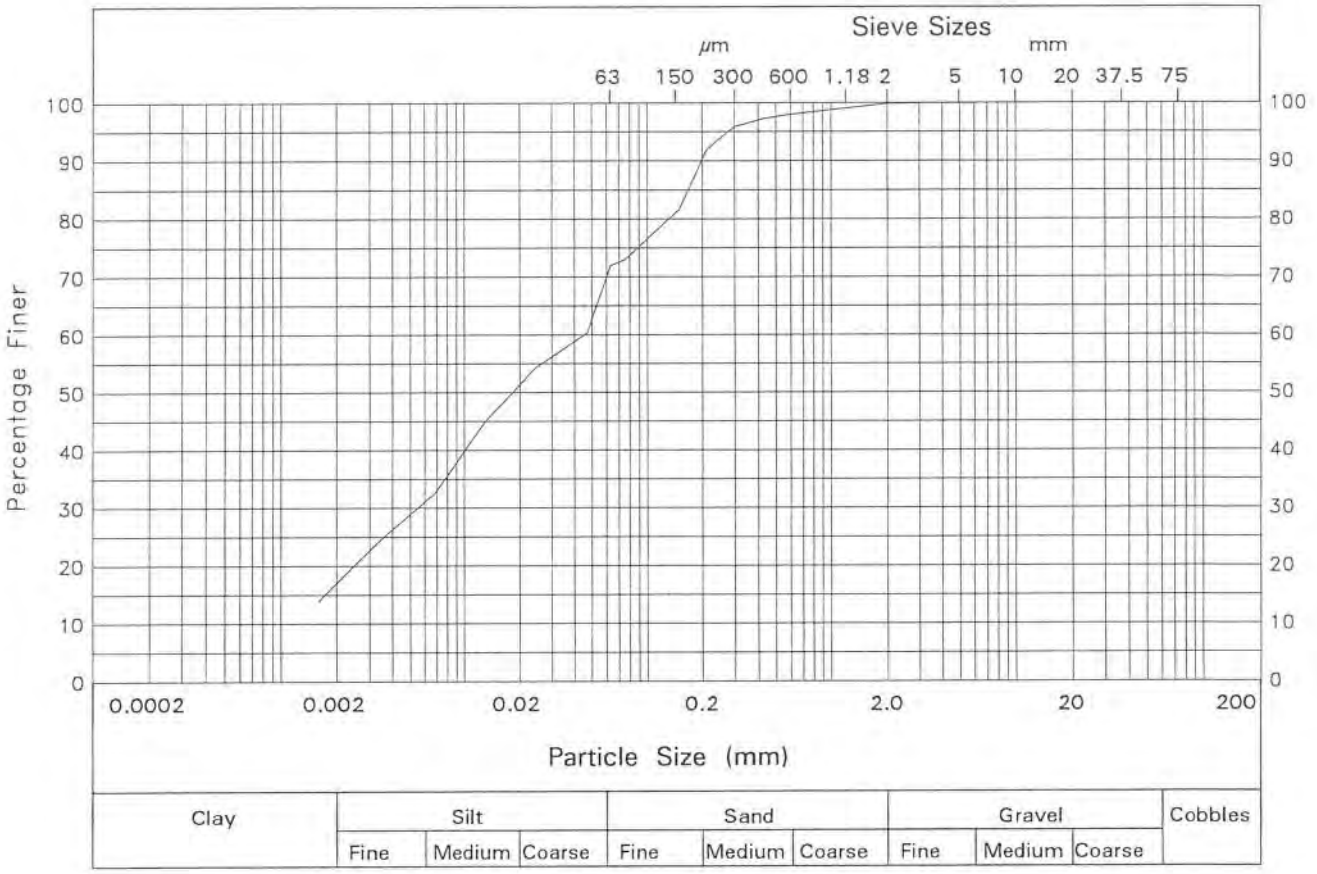
Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

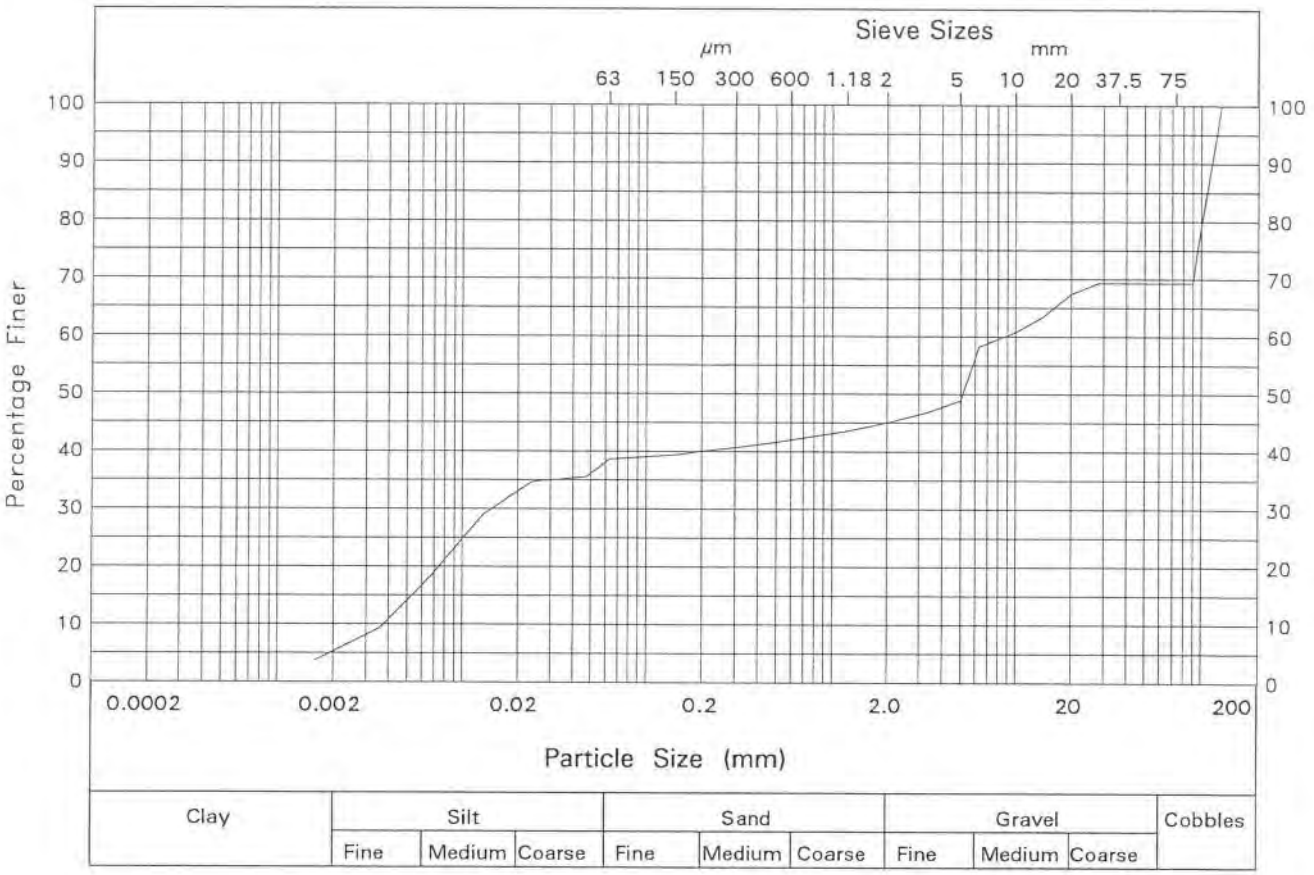


Particle Size	% Passing	Particle Size	% Passing
6.3 mm	100	47 μm	60
5 mm	100	24 μm	54
3.35 mm	100	13 μm	45
2 mm	100		
1.18 mm	99		
600 μm	98		
425 μm	97		
300 μm	96		
212 μm	92		
150 μm	82		
75 μm	73		
63 μm	72		

Hole BH145A	Description Slightly sandy SILT
Depth 5.50 -5.95	
Type D	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
90 mm	69	2 mm	45
75 mm	69	1.18 mm	44
63 mm	69	600 μm	42
50 mm	69	425 μm	41
37.5 mm	69	300 μm	41
28 mm	69	212 μm	40
20 mm	67	150 μm	39
14 mm	63	75 μm	39
10 mm	61	63 μm	39
6.3 mm	58	47 μm	36
5 mm	49	24 μm	35
3.35 mm	47	13 μm	29

Hole TP34	Description Slightly sandy gravelly CLAY
Depth 1.40 -1.60	
Type B	
Test Performed Dry	Uniformity Coefficient not applicable.

Form 25/4

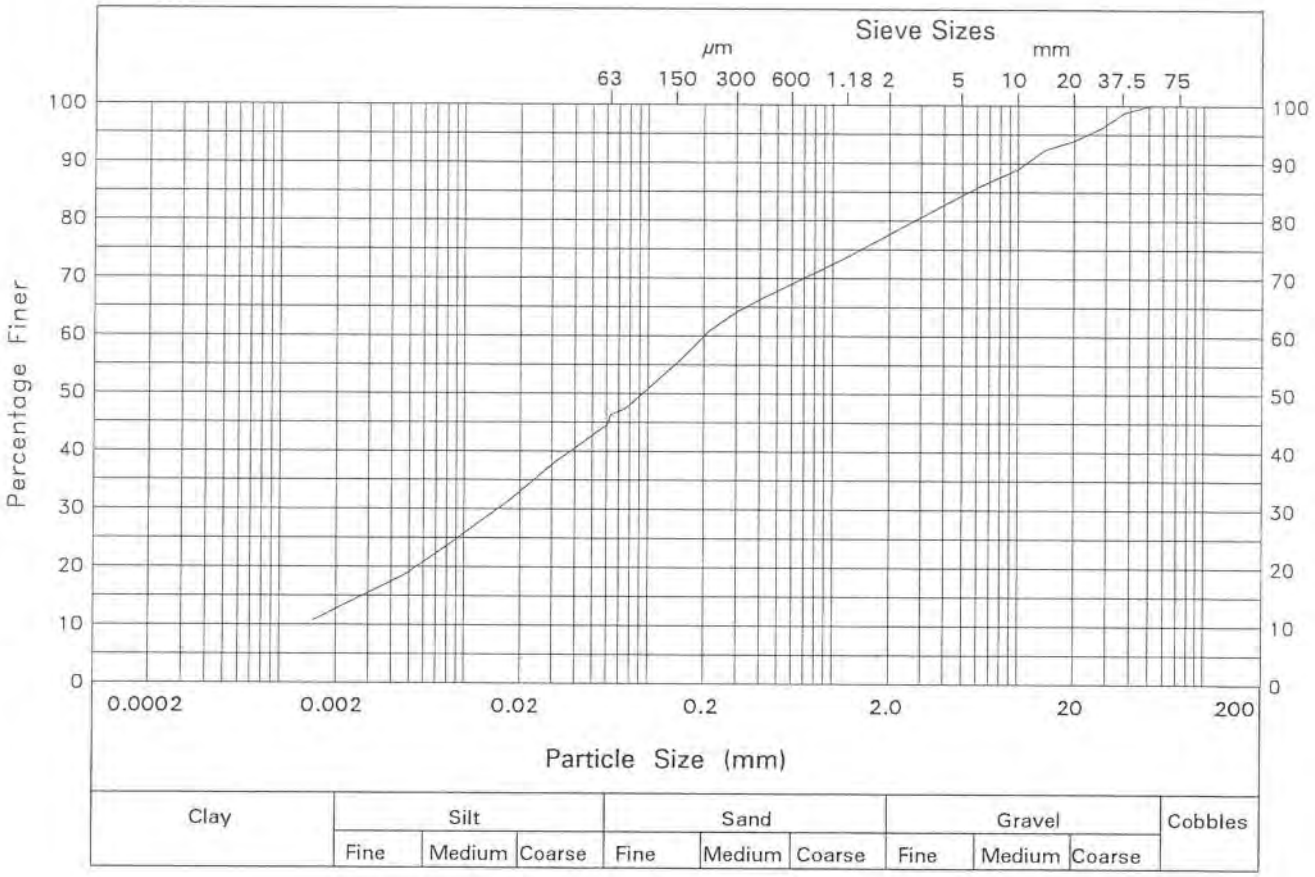
Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

Particle Size	% Passing	Particle Size	% Passing
14 mm	100	75 μm	62
10 mm	94	63 μm	61
6.3 mm	89	37 μm	48
5 mm	74	26 μm	46
3.35 mm	73	14 μm	36
2 mm	71		
1.18 mm	68		
600 μm	66		
425 μm	65		
300 μm	64		
212 μm	64		
150 μm	62		

Hole TP40	Description Slightly sandy slightly gravelly organic SILT
Depth 2.80	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

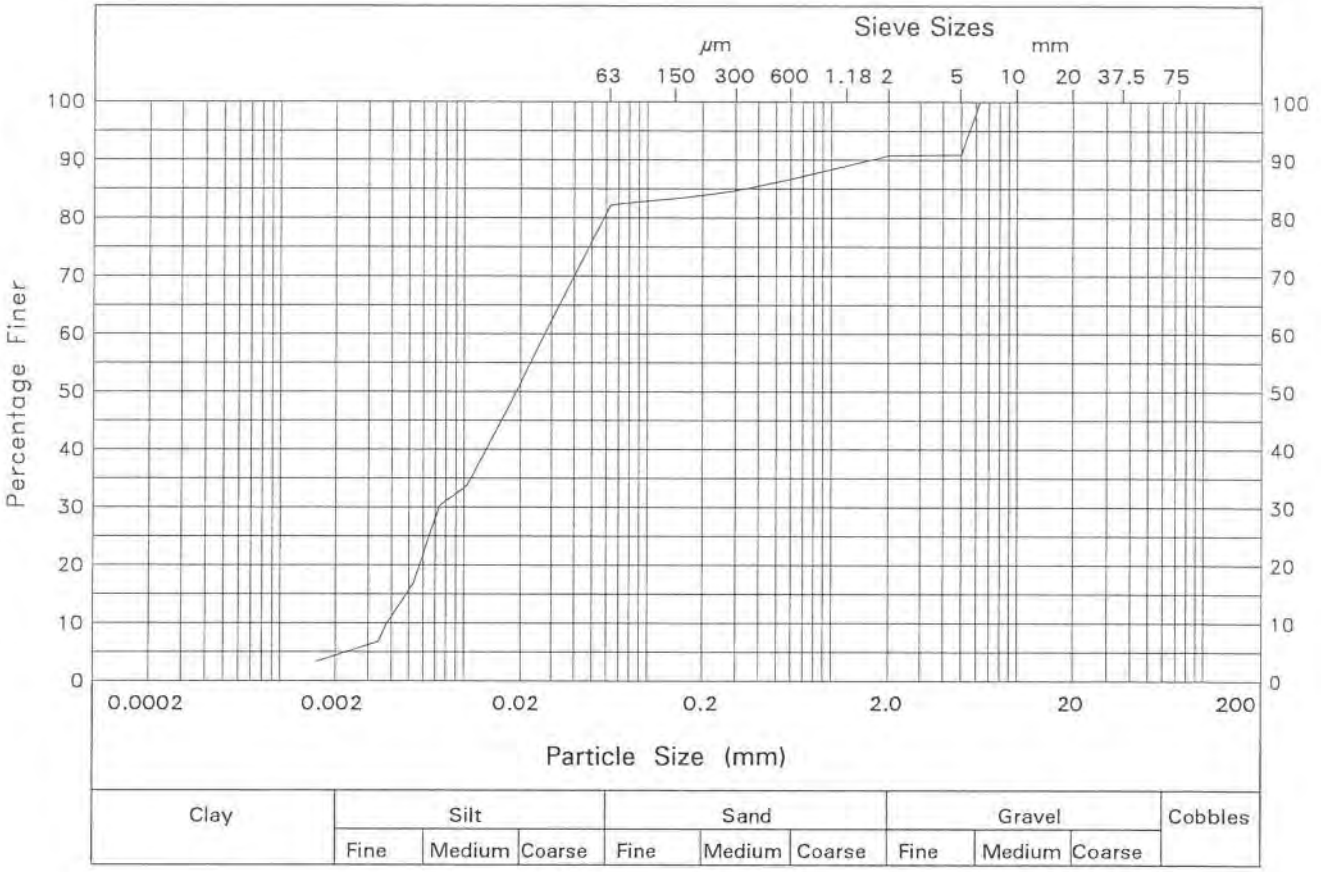


Particle Size	% Passing	Particle Size	% Passing
50 mm	100	425 μm	67
37.5 mm	99	300 μm	64
28 mm	96	212 μm	61
20 mm	94	150 μm	56
14 mm	92	75 μm	47
10 mm	89	63 μm	46
6.3 mm	86	61 μm	45
5 mm	84	32 μm	38
3.35 mm	81	17 μm	31
2 mm	78		
1.18 mm	74		
600 μm	69		

Hole TP56	Description Slightly sandy slightly gravelly CLAY
Depth 1.50 -2.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

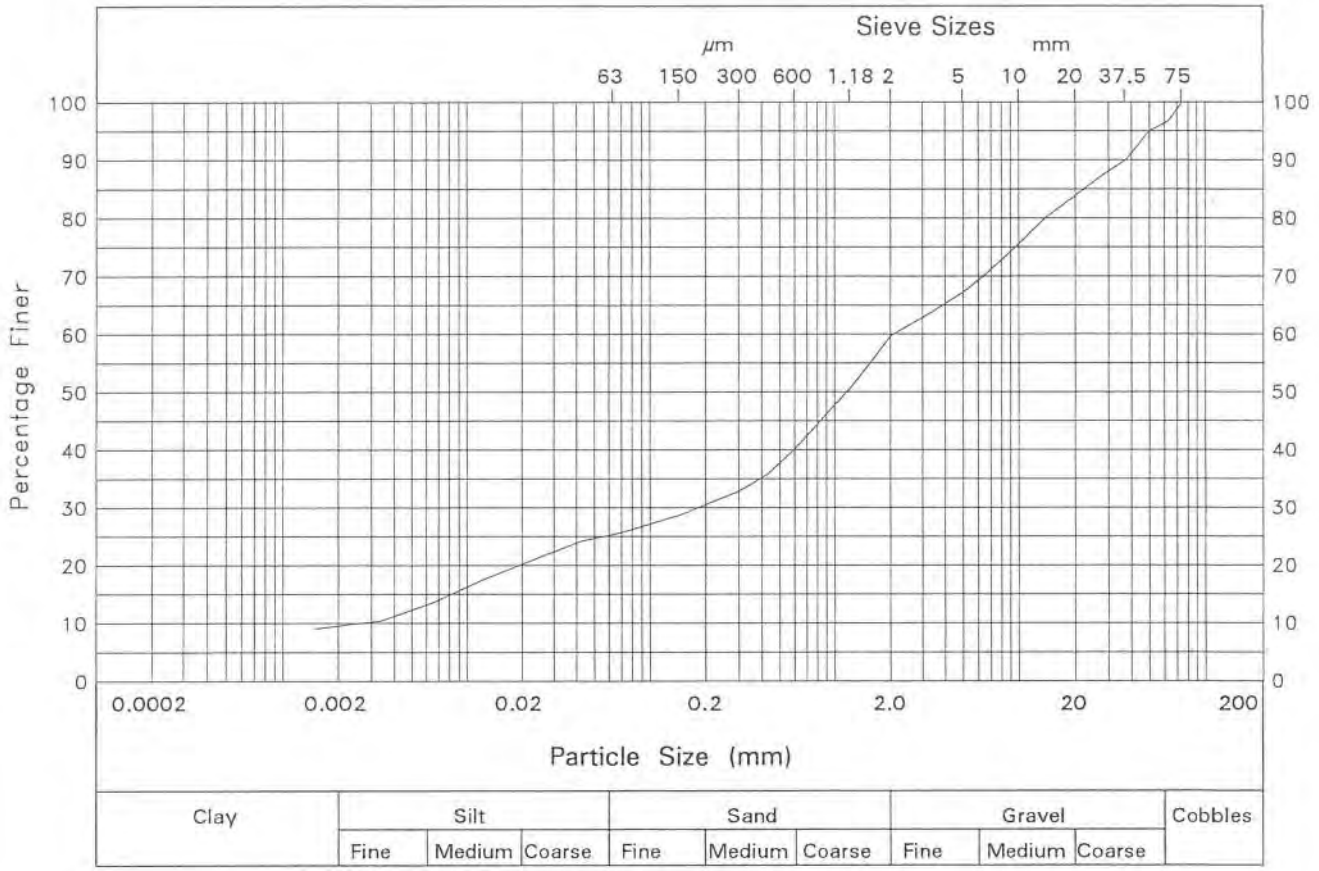


Particle Size	% Passing	Particle Size	% Passing
6.3 mm	100	10 μm	34
5 mm	91	7 μm	30
3.35 mm	91	5 μm	17
2 mm	91		
1.18 mm	89		
600 μm	87		
425 μm	86		
300 μm	85		
212 μm	84		
150 μm	83		
75 μm	83		
63 μm	82		

Hole TP104	Description: Slightly sandy slightly gravelly organic SILT
Depth 3.40	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

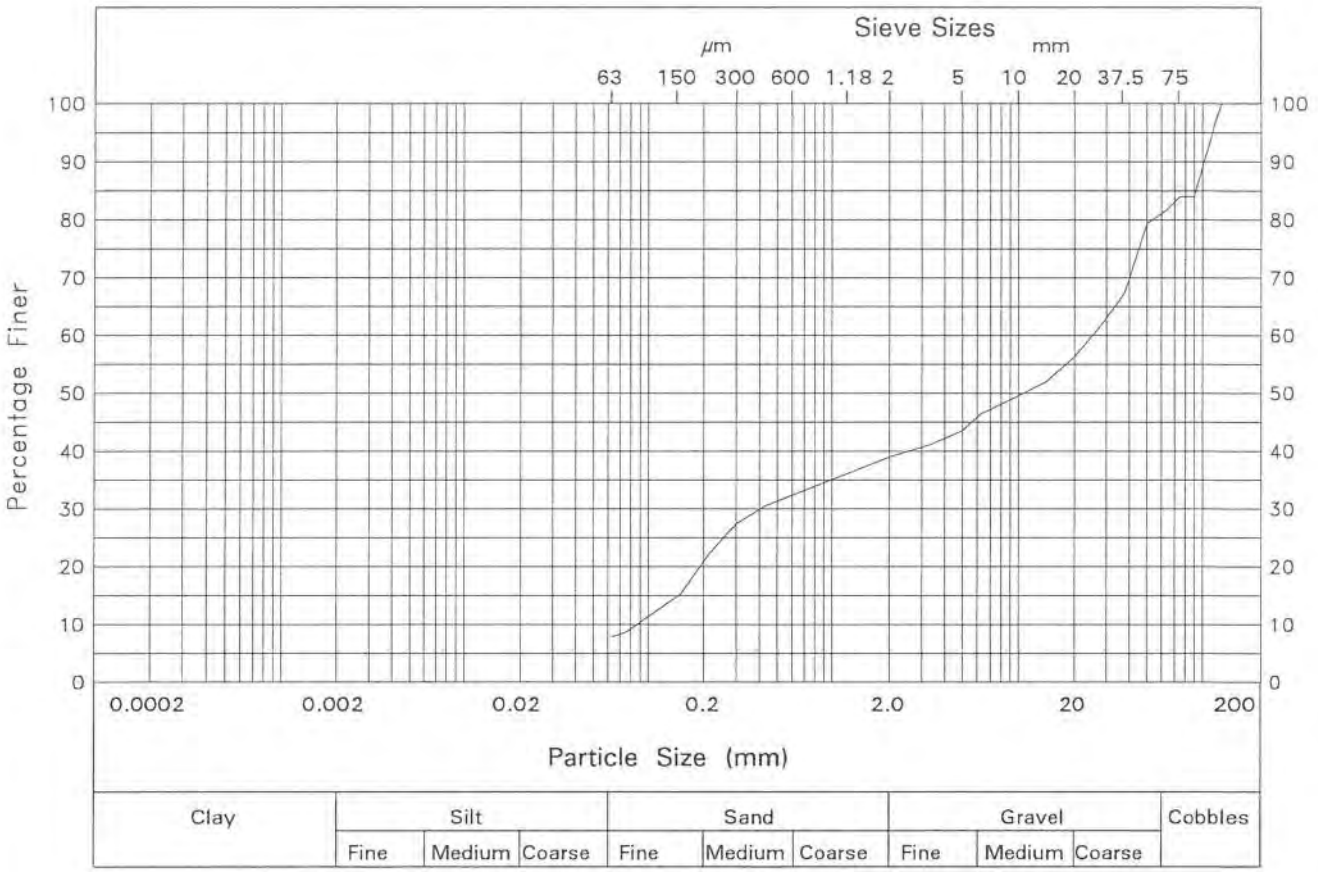


Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	50
63 mm	97	600 μm	40
50 mm	95	425 μm	36
37.5 mm	90	300 μm	33
28 mm	87	212 μm	31
20 mm	84	150 μm	29
14 mm	80	75 μm	26
10 mm	75	63 μm	25
6.3 mm	70	43 μm	24
5 mm	67	23 μm	21
3.35 mm	64	12 μm	18
2 mm	60		

Hole TP113	Description Slightly sandy gravelly CLAY
Depth 1.40	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

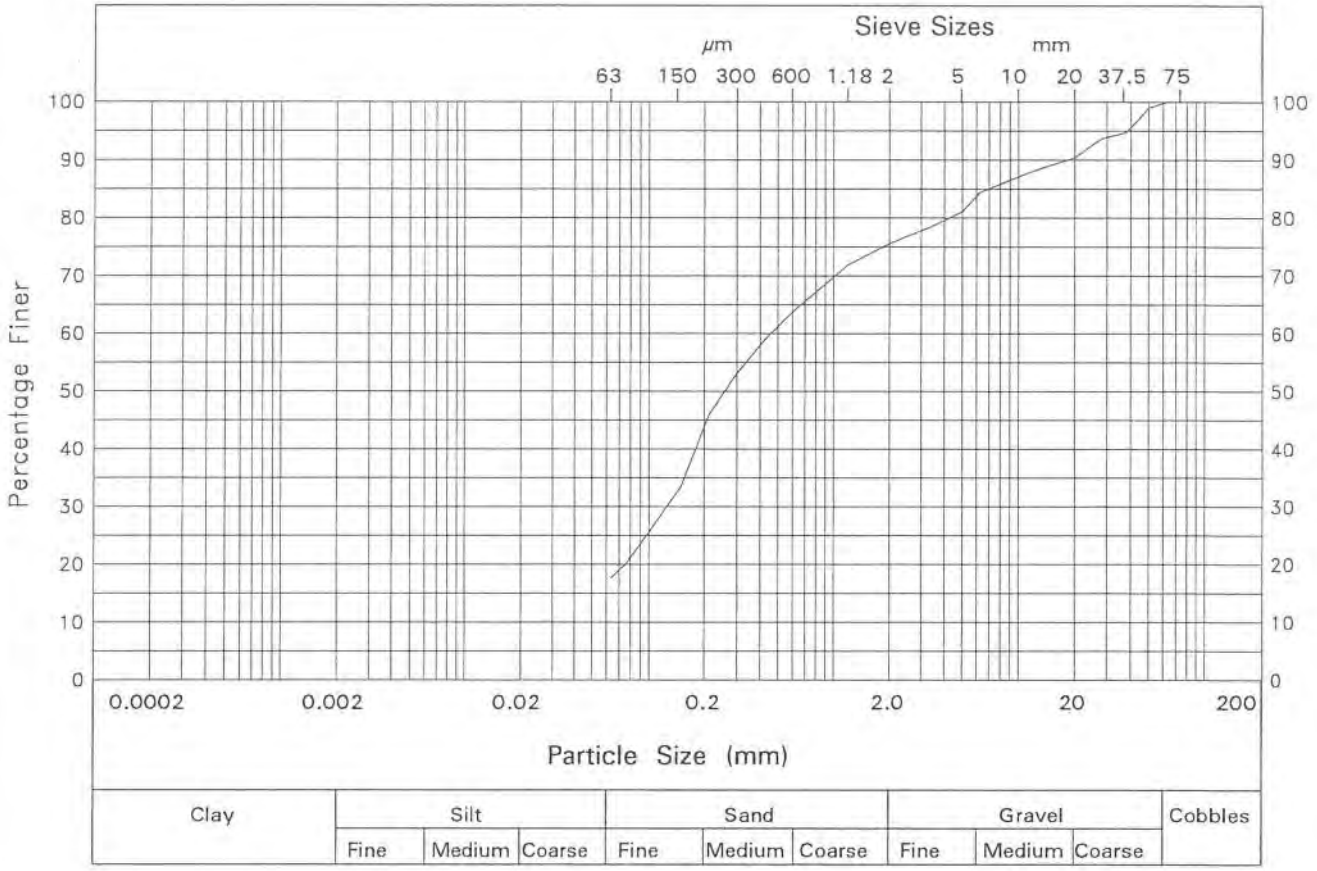


Particle Size	% Passing	Particle Size	% Passing
90 mm	84	2 mm	39
75 mm	84	1.18 mm	36
63 mm	82	600 µm	32
50 mm	79	425 µm	30
37.5 mm	67	300 µm	27
28 mm	62	212 µm	22
20 mm	56	150 µm	15
14 mm	52	75 µm	9
10 mm	50	63 µm	8
6.3 mm	46		
5 mm	44		
3.35 mm	41		

Hole TP121	Description Clayey very sandy GRAVEL
Depth 1.00 -1.30	
Type B	
Test Performed Dry	Uniformity Coefficient = 302

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

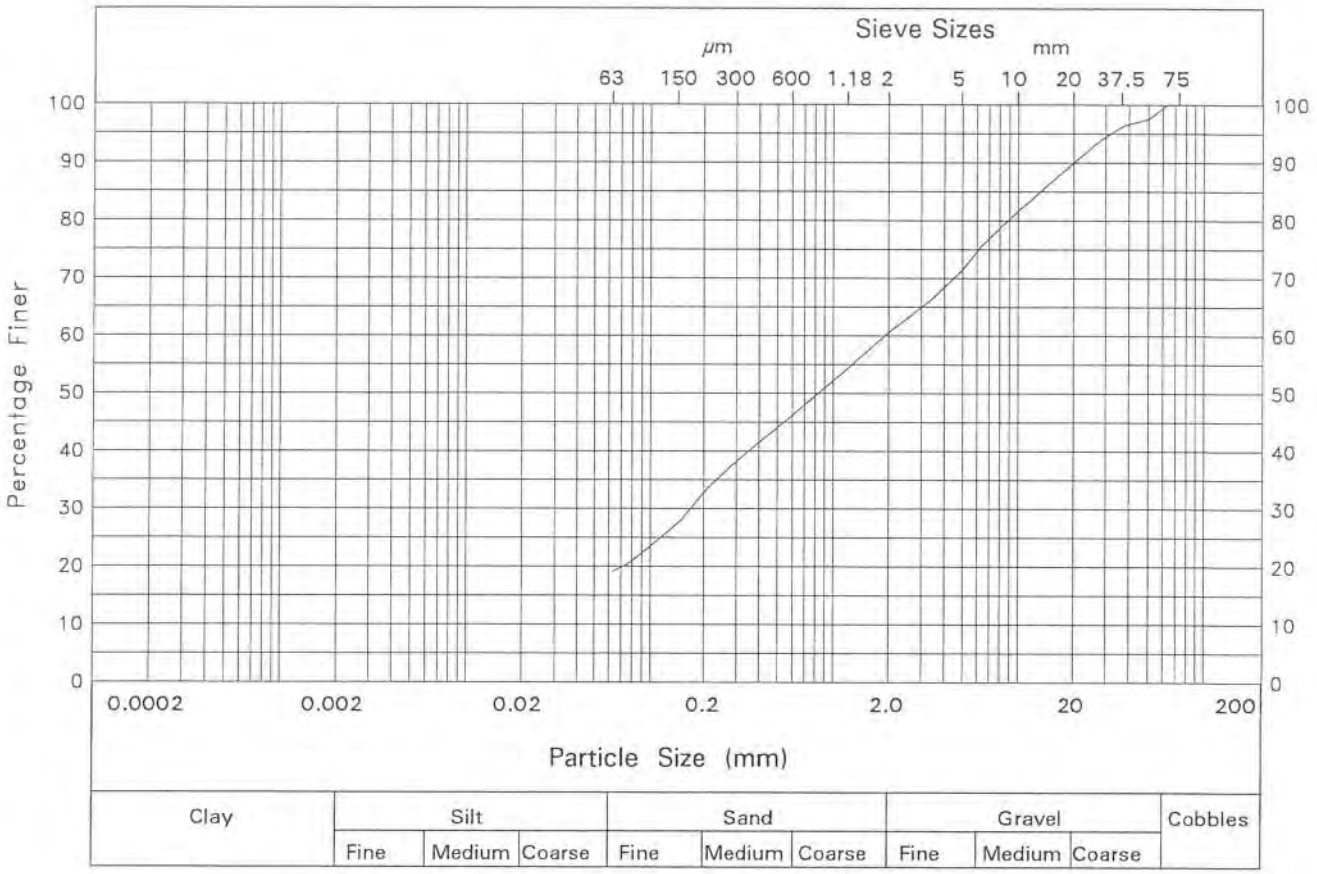


Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	64
50 mm	99	425 μm	59
37.5 mm	95	300 μm	53
28 mm	94	212 μm	46
20 mm	90	150 μm	33
14 mm	89	75 μm	20
10 mm	87	63 μm	18
6.3 mm	84		
5 mm	81		
3.35 mm	78		
2 mm	76		
1.18 mm	72		

Hole TP123	Description Clayey very gravelly SAND
Depth 1.50 -1.80	
Type B	
Test Performed Dry	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



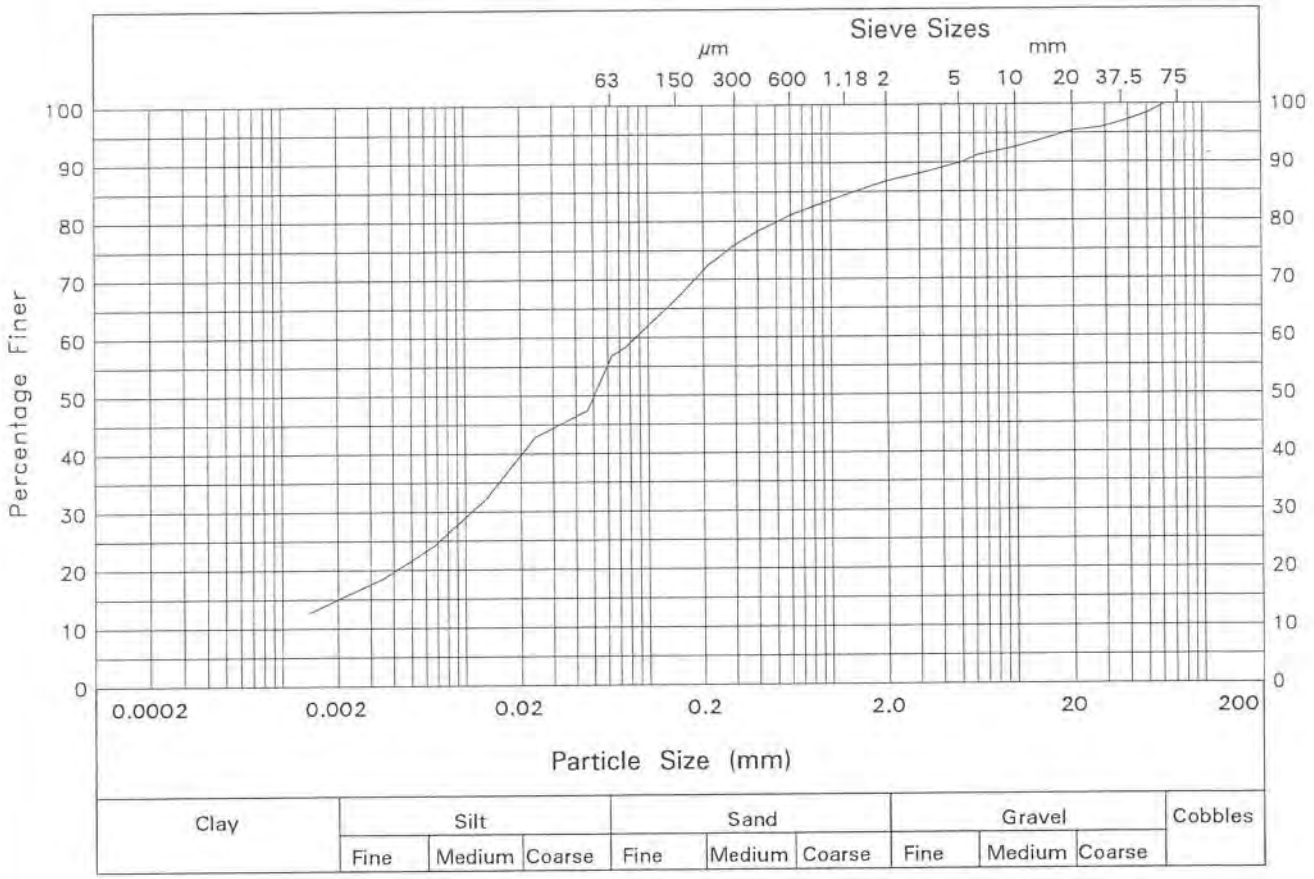
Clay	Silt			Sand			Gravel			Cobbles
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	

Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	46
50 mm	98	425 μm	42
37.5 mm	96	300 μm	38
28 mm	94	212 μm	34
20 mm	90	150 μm	28
14 mm	86	75 μm	20
10 mm	82	63 μm	19
6.3 mm	75		
5 mm	71		
3.35 mm	66		
2 mm	61		
1.18 mm	54		

Hole TP125	Description: Very clayey SAND and GRAVEL
Depth 1.50 -1.70	
Type B	
Test Performed Dry	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

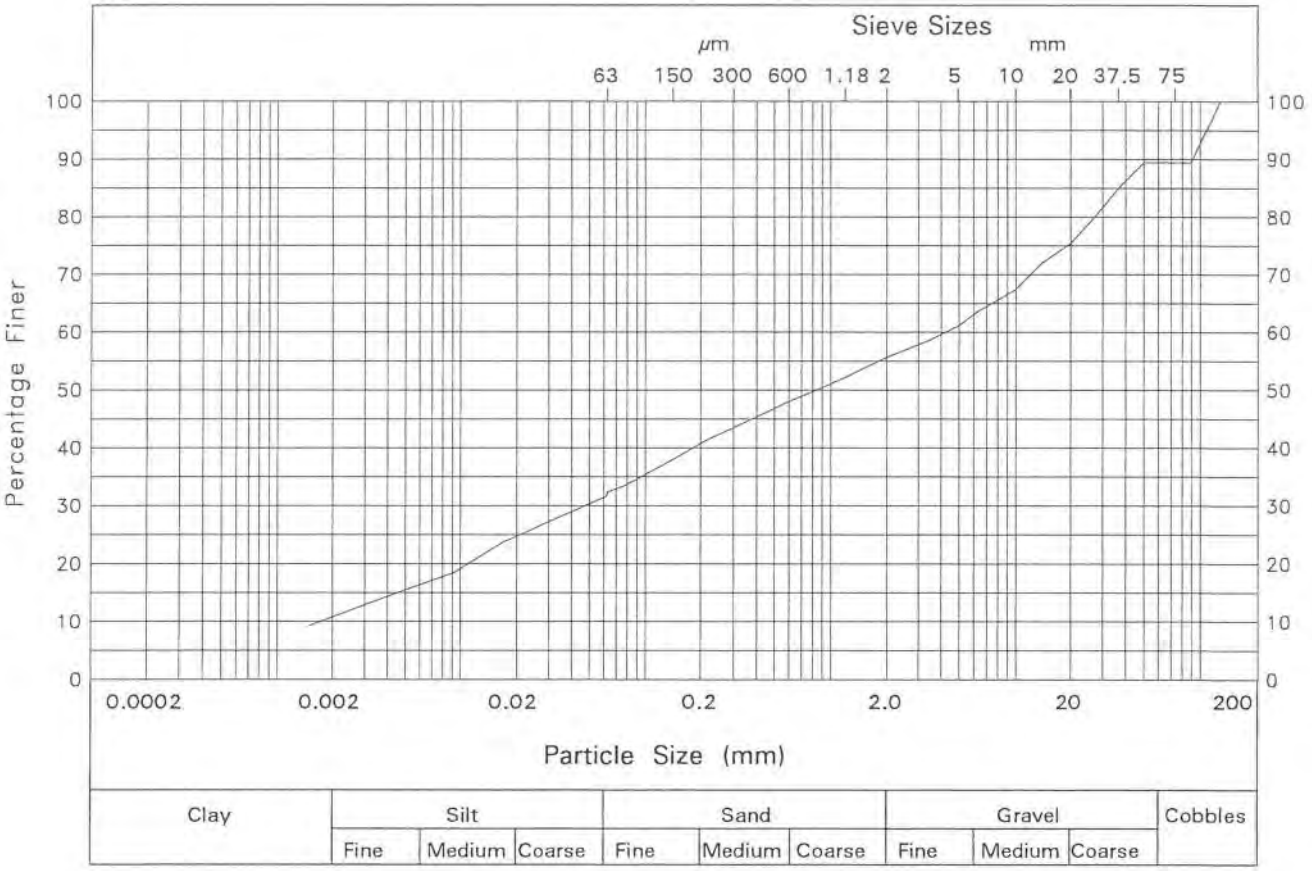


Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	81
50 mm	98	425 μm	79
37.5 mm	97	300 μm	76
28 mm	96	212 μm	72
20 mm	95	150 μm	67
14 mm	94	75 μm	58
10 mm	93	63 μm	57
6.3 mm	91	46 μm	47
5 mm	90	24 μm	43
3.35 mm	88	13 μm	32
2 mm	87		
1.18 mm	84		

Hole TP127A	Description Slightly sandy slightly gravelly CLAY
Depth 0.50 -0.80	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

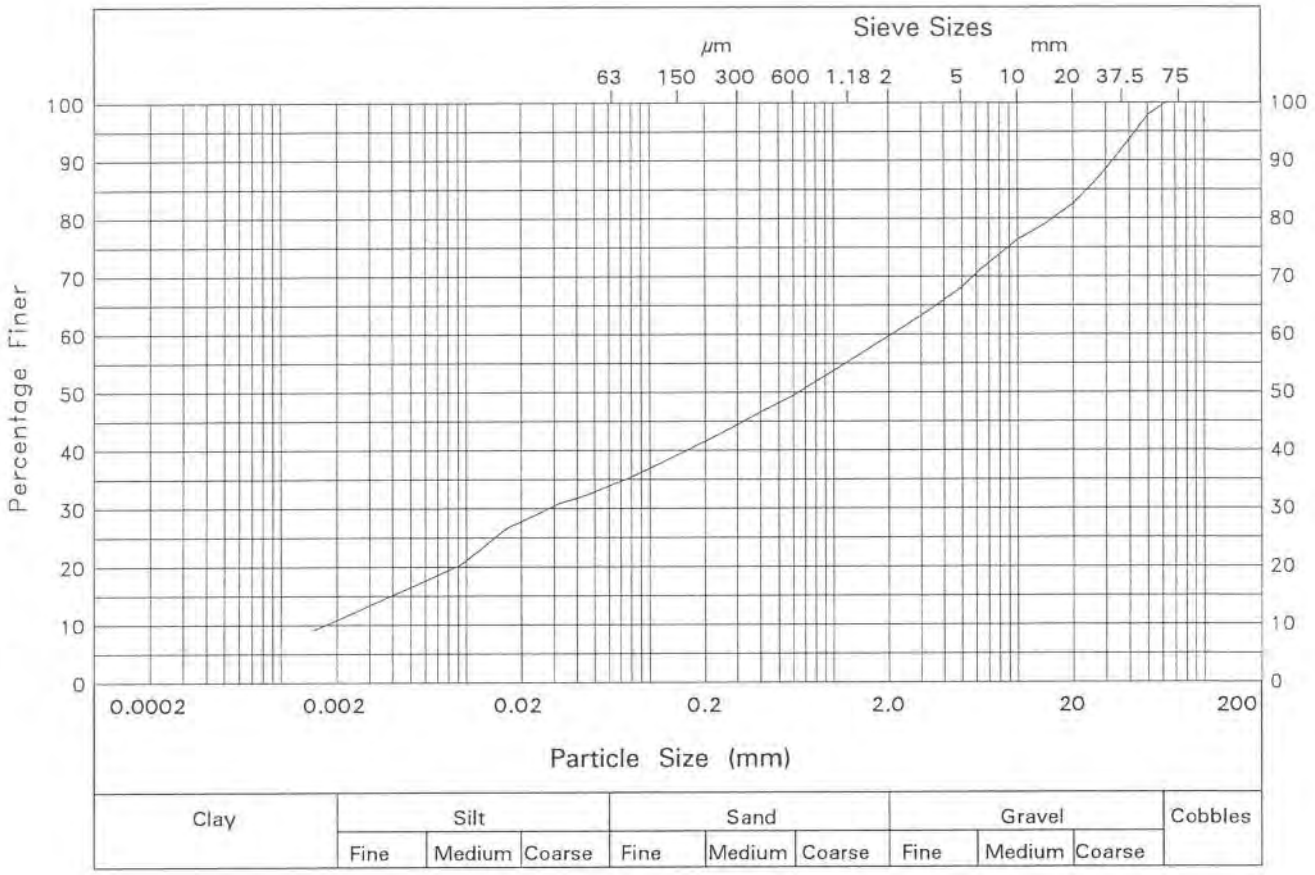


Particle Size	% Passing	Particle Size	% Passing
90 mm	89	2 mm	56
75 mm	89	1.18 mm	52
63 mm	89	600 μm	48
50 mm	89	425 μm	46
37.5 mm	85	300 μm	44
28 mm	81	212 μm	41
20 mm	75	150 μm	38
14 mm	72	75 μm	33
10 mm	67	63 μm	32
6.3 mm	64	62 μm	32
5 mm	61	33 μm	28
3.35 mm	58	17 μm	24

Hole TP127B	Description: Slightly sandy gravelly CLAY
Depth 0.50 -1.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

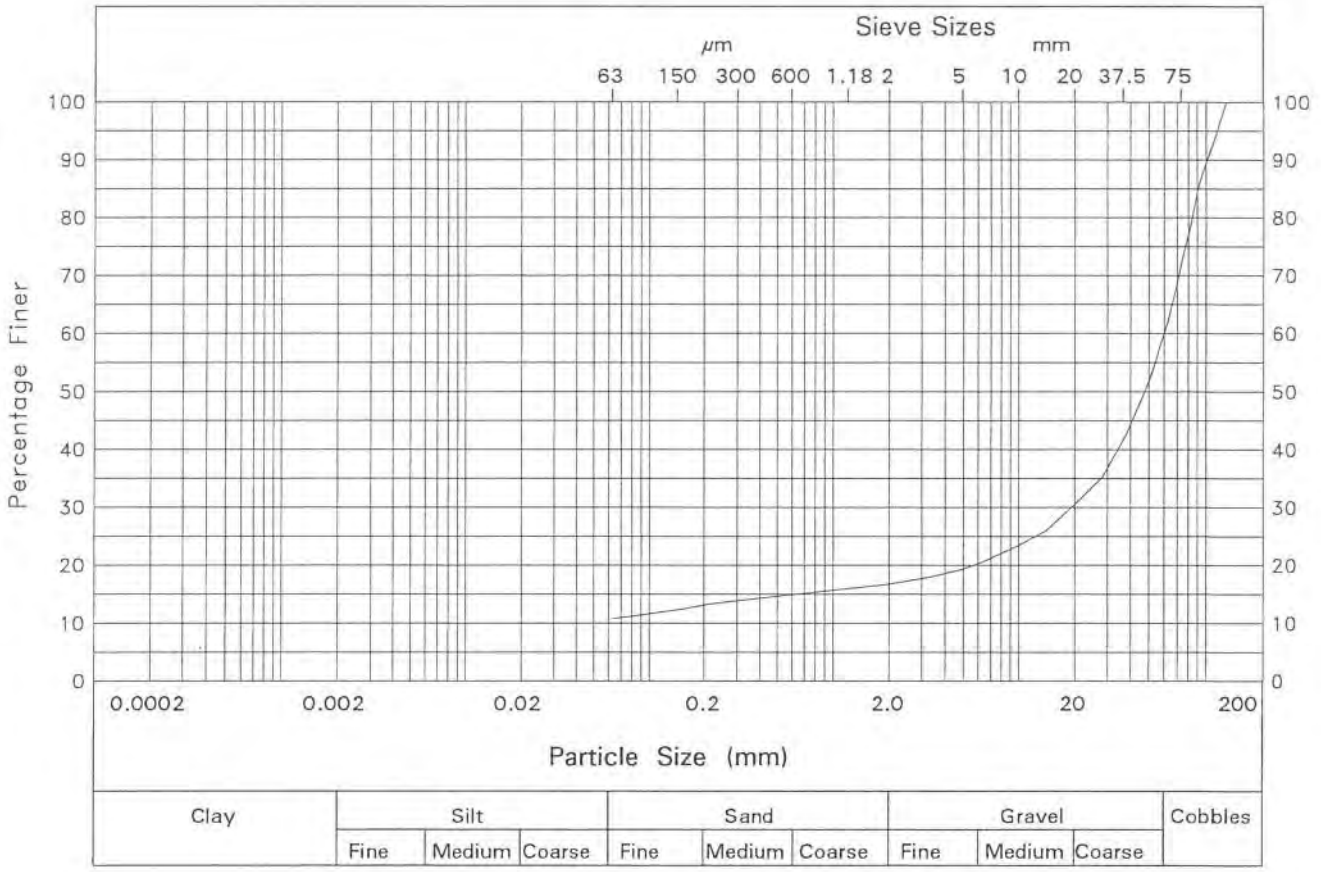


Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	49
50 mm	98	425 μm	47
37.5 mm	92	300 μm	44
28 mm	87	212 μm	42
20 mm	83	150 μm	40
14 mm	79	75 μm	35
10 mm	76	63 μm	34
6.3 mm	71	45 μm	32
5 mm	68	32 μm	31
3.35 mm	64	17 μm	27
2 mm	60		
1.18 mm	55		

Hole TP128	Description Slightly sandy gravelly CLAY
Depth 0.20 -0.30	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
90 mm	85	2 mm	17
75 mm	73	1.18 mm	16
63 mm	62	600 μm	15
50 mm	52	425 μm	14
37.5 mm	42	300 μm	14
28 mm	35	212 μm	13
20 mm	31	150 μm	12
14 mm	26	75 μm	11
10 mm	23	63 μm	11
6.3 mm	21		
5 mm	19		
3.35 mm	18		

Hole TP134	Description Clayey sandy GRAVEL
Depth 0.50 -0.80	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

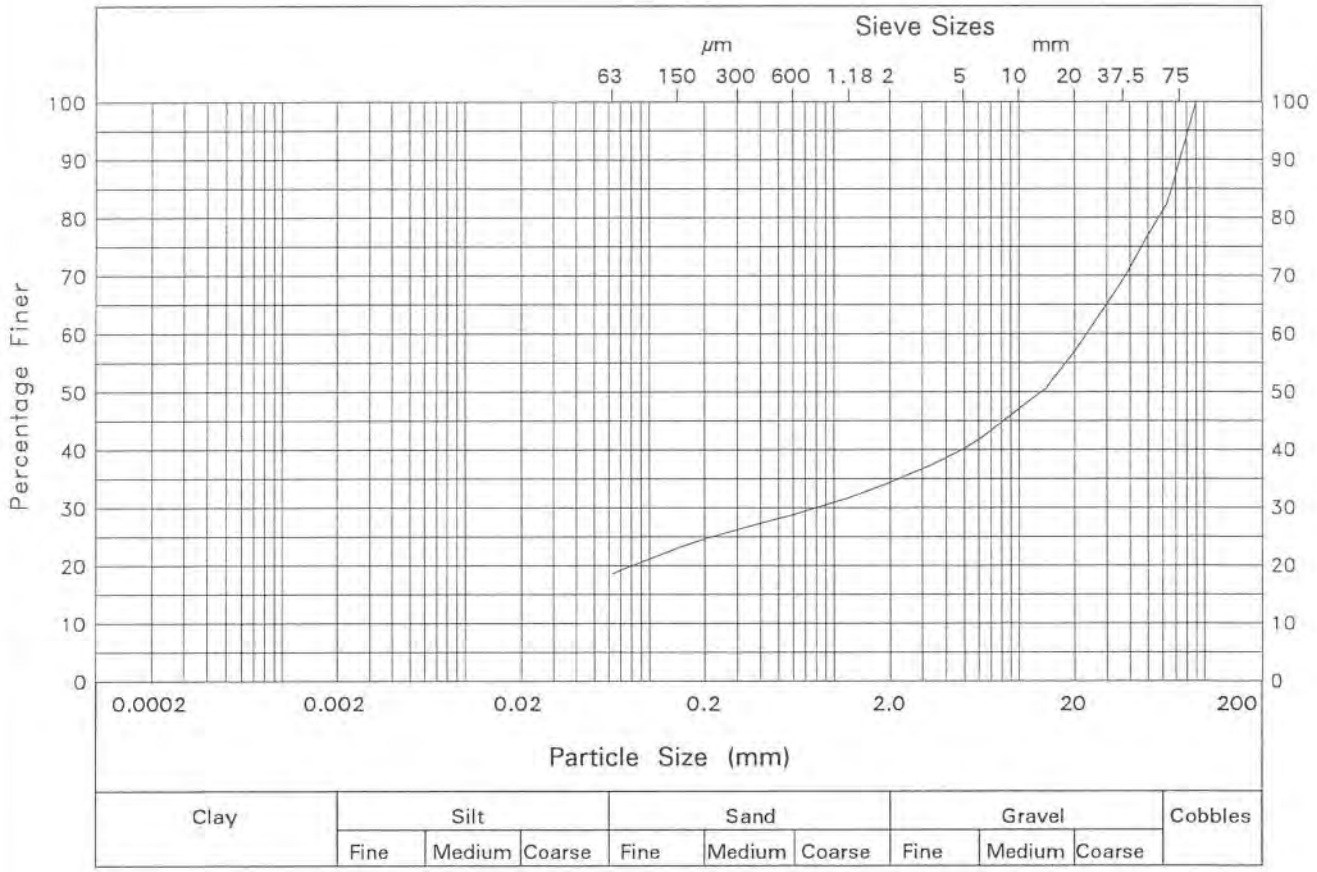
Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	71
50 mm	97	425 μm	70
37.5 mm	92	300 μm	68
28 mm	89	212 μm	66
20 mm	87	150 μm	63
14 mm	86	75 μm	57
10 mm	84	63 μm	55
6.3 mm	82	14 μm	19
5 mm	80	10 μm	16
3.35 mm	78	7 μm	13
2 mm	77		
1.18 mm	75		

Hole TP134A	Description: Slightly sandy slightly gravelly CLAY
Depth 0.50 -1.00	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

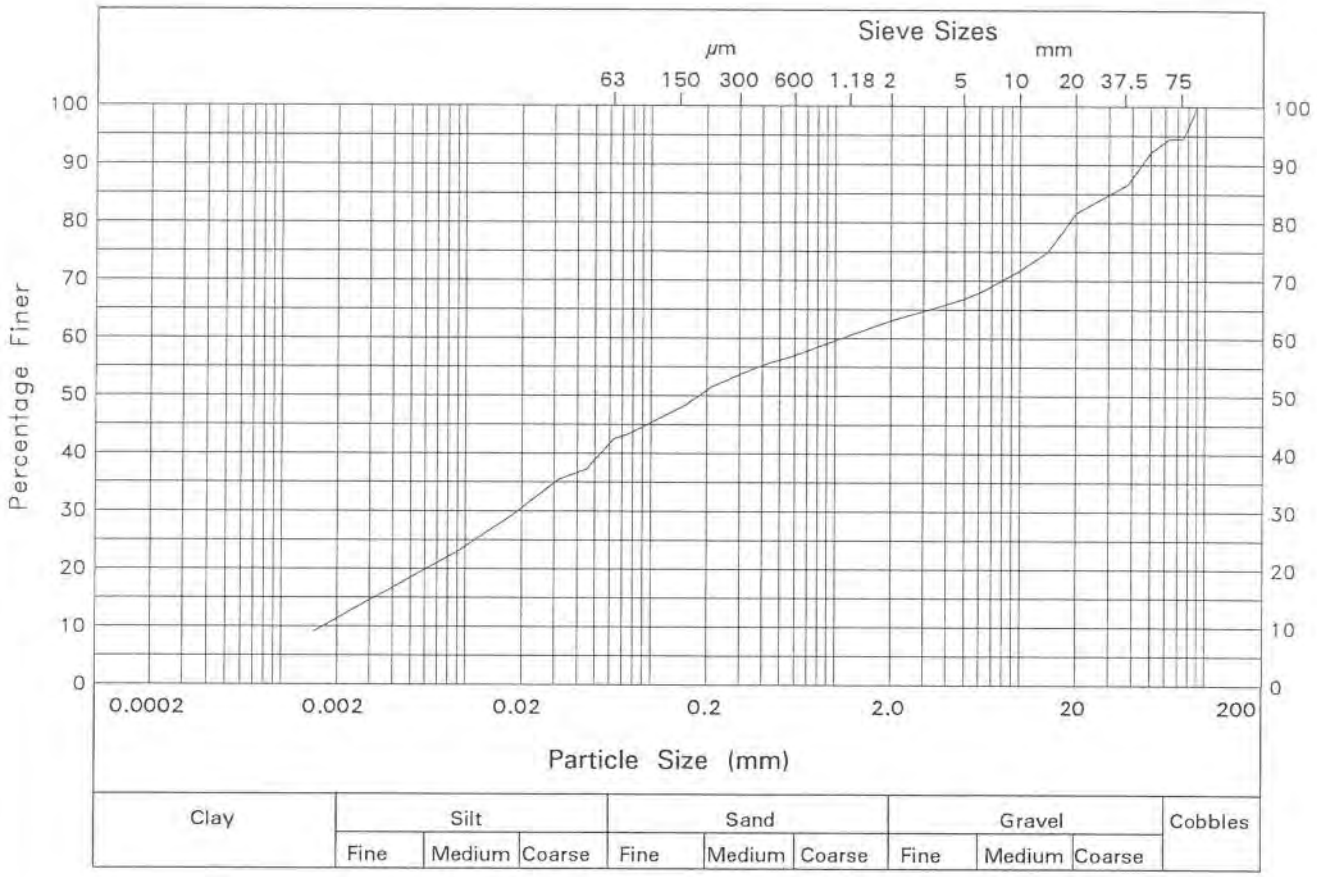


Particle Size	% Passing	Particle Size	% Passing
90 mm	100	2 mm	34
75 mm	91	1.18 mm	32
63 mm	82	600 μm	29
50 mm	77	425 μm	28
37.5 mm	70	300 μm	26
28 mm	64	212 μm	25
20 mm	57	150 μm	23
14 mm	51	75 μm	20
10 mm	47	63 μm	19
6.3 mm	42		
5 mm	40		
3.35 mm	37		

Hole TP136	Description MADE GROUND: Slightly sandy very gravelly CLAY
Depth 0.50 -0.90	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

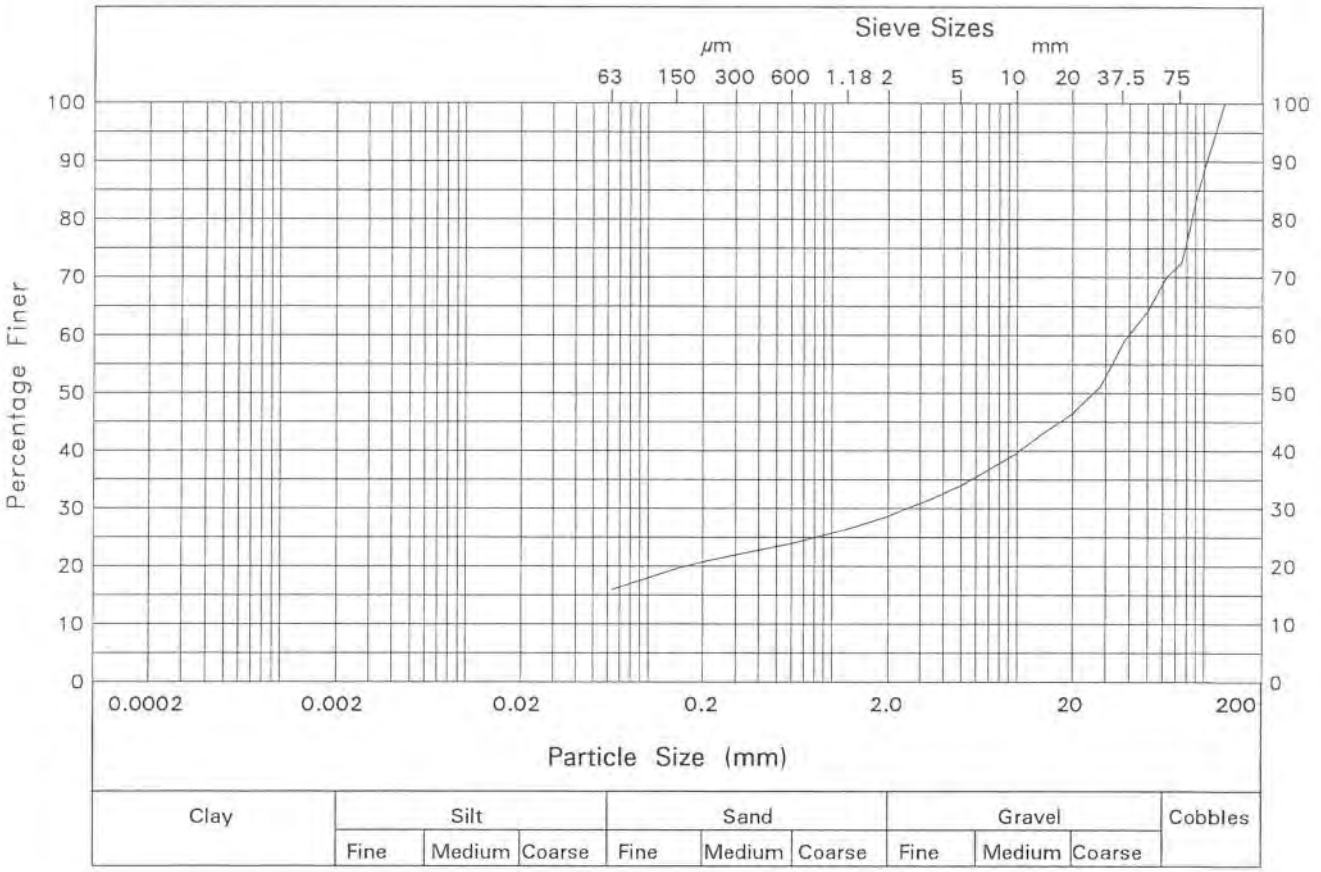


Particle Size	% Passing	Particle Size	% Passing
90 mm	100	2 mm	63
75 mm	94	1.18 mm	60
63 mm	94	600 μm	57
50 mm	92	425 μm	56
37.5 mm	87	300 μm	54
28 mm	84	212 μm	52
20 mm	82	150 μm	48
14 mm	75	75 μm	43
10 mm	72	63 μm	42
6.3 mm	68	45 μm	37
5 mm	67	32 μm	36
3.35 mm	65	17 μm	29

Hole TP139	Description Slightly sandy gravelly SILT
Depth 0.20 -0.50	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

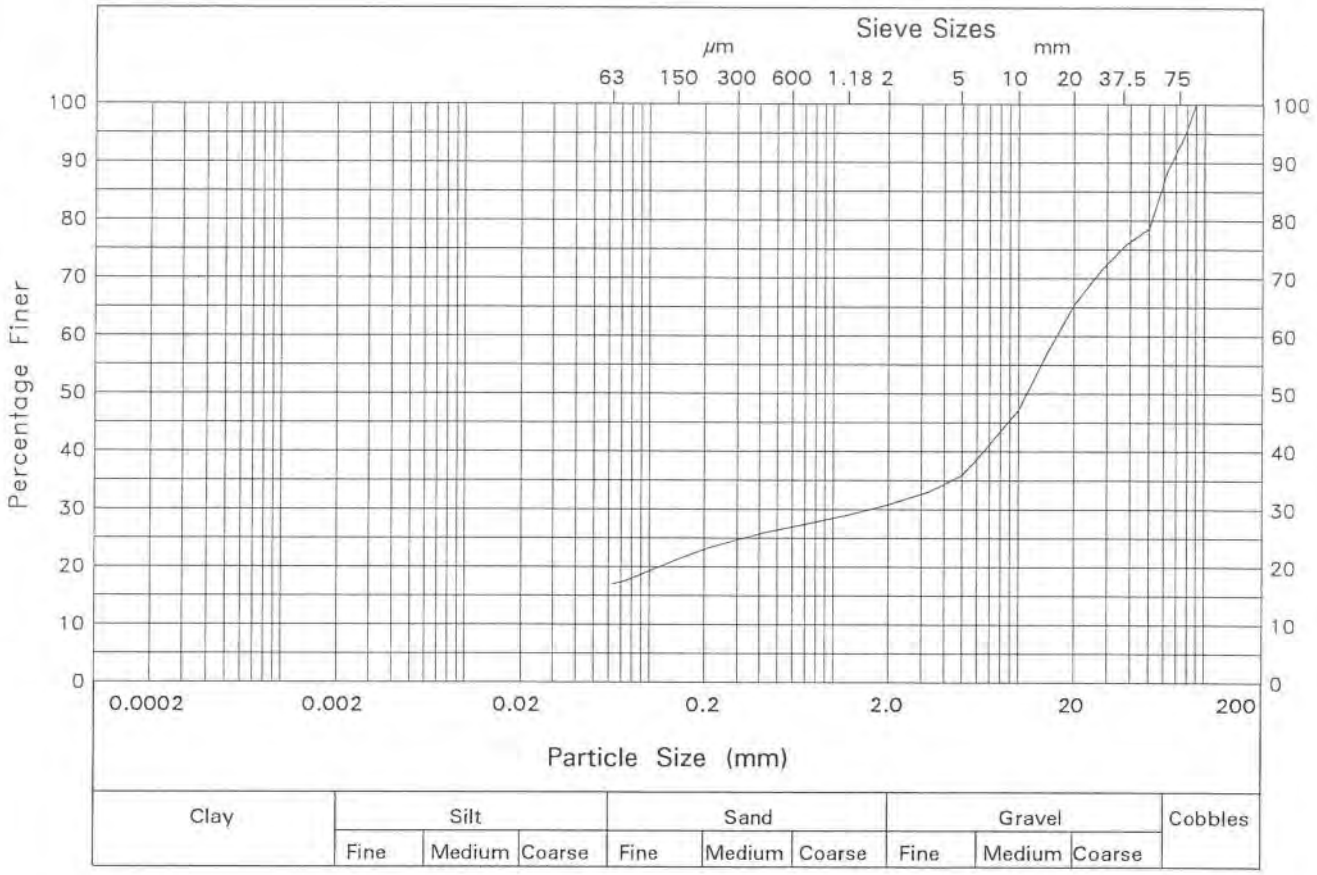


Particle Size	% Passing	Particle Size	% Passing
90 mm	83	2 mm	29
75 mm	72	1.18 mm	26
63 mm	70	600 μm	24
50 mm	64	425 μm	23
37.5 mm	59	300 μm	22
28 mm	51	212 μm	21
20 mm	46	150 μm	20
14 mm	43	75 μm	17
10 mm	40	63 μm	16
6.3 mm	36		
5 mm	34		
3.35 mm	32		

Hole TP142	Description: Slightly sandy very gravelly SILT
Depth 1.00 -1.40	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

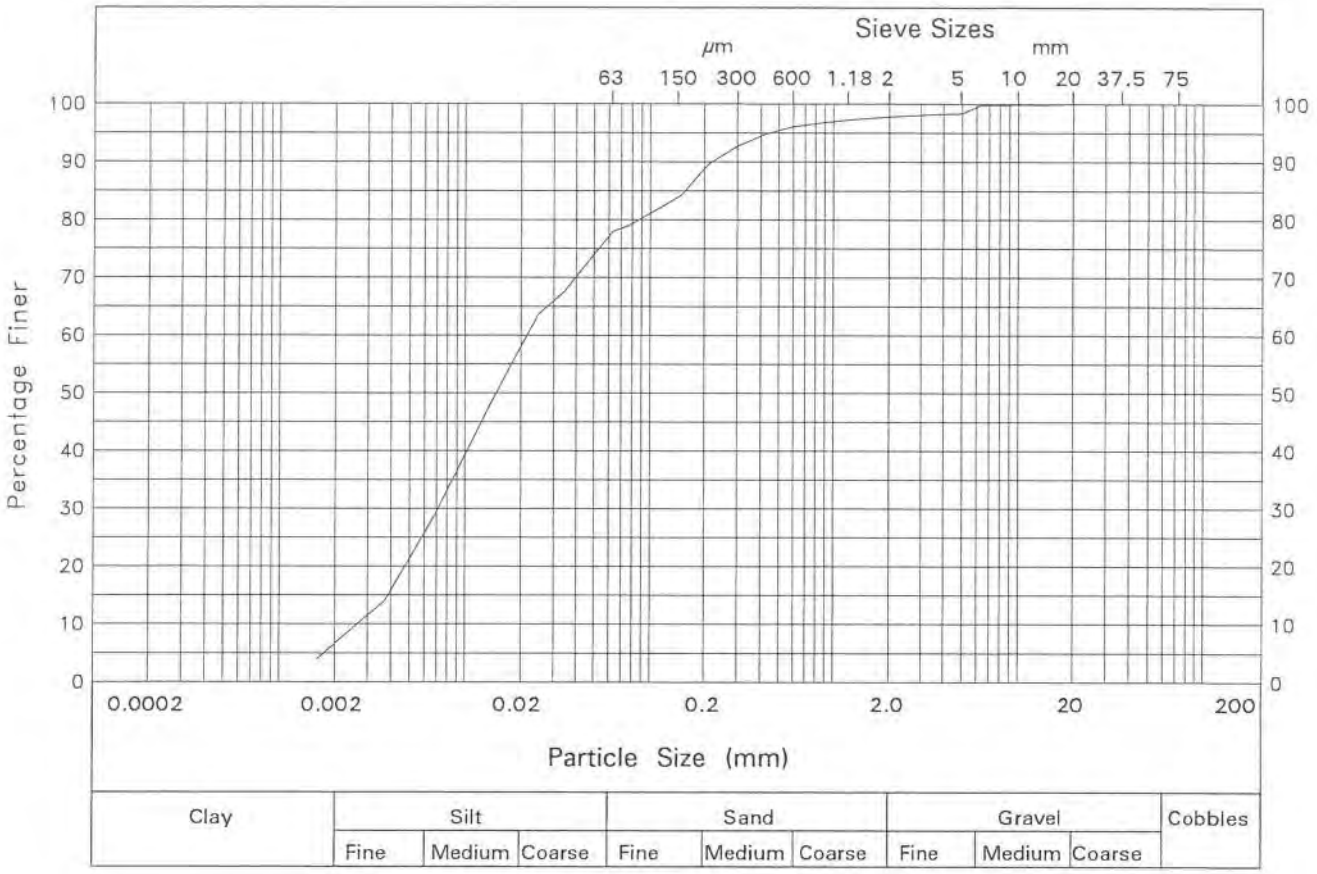


Particle Size	% Passing	Particle Size	% Passing
90 mm	100	2 mm	31
75 mm	93	1.18 mm	29
63 mm	89	600 µm	27
50 mm	79	425 µm	26
37.5 mm	76	300 µm	25
28 mm	71	212 µm	23
20 mm	65	150 µm	22
14 mm	57	75 µm	18
10 mm	47	63 µm	17
6.3 mm	39		
5 mm	36		
3.35 mm	33		

Hole TP146	Description Slightly sandy very gravelly SILT
Depth 1.00 -1.50	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**



Clay	Silt			Sand			Gravel			Cobbles
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	

Particle Size	% Passing	Particle Size	% Passing
20 mm	100	150 μm	84
14 mm	100	75 μm	79
10 mm	100	63 μm	78
6.3 mm	100	35 μm	68
5 mm	98	25 μm	64
3.35 mm	98	14 μm	48
2 mm	98		
1.18 mm	97		
600 μm	96		
425 μm	95		
300 μm	93		
212 μm	90		

Hole TP148	Description Organic slightly sandy CLAY with rare gravel
Depth 2.50 -2.70	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough Galway County Council	**Contract** KC3210
Exploration Associates		**Sheet**

Borehole Log

Drilled by GC Logged by JL Checked by ROR	Start 03/10/2003 End 03/10/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level Coordinates National Grid	+6.33 mOD E 127495.60 N 228378.30
		Dando 175 Cable Percussion 200 diameter from 0.0m to 2.40m.	0.00m	2.40m	200mm			

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			03/10/2003	0800
0.50-0.95 0.50-0.90	SPT S B 1	N=1 (-,1/-,-,1,-)		
1.60-2.05 1.60-2.00	SPT S B 2	N=1 (-,-/1,-,-,-)		
2.20-2.30	B 3		03/10/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Peat with roots**	0.20 +6.13		
Plastic to spongy dark brown to black amorphous Peat with frequent decaying rootlets and occasional grass. (0.20-1.50 m Driller noted pieces of timber)	(1.30) 1.50 +4.83		1
Plastic to spongy dark brown to black amorphous Peat with frequent decaying rootlets/grass, occasional pockets of uncompact cream silt with shells and occasional cobbles sized pockets of spongy brown clayey fibrous peat.	(0.55) 2.05 +4.28		1
Cream SILT with shells**	2.10 +4.23		
Grey angular GRAVEL** Recovered as gravelly COBBLES. Gravel is subangular coarse. Cobbles are subangular of limestone.	(0.30) 2.40 +3.93		SP

EXPLORATORY HOLE ENDS AT 2.40 m

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.10	Rose to 0.80 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
2.40		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
2.30 -2.40	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIN (298) 11/02/2004 15:39:38 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.: KC3210
Carried out for: Galway County Council

Borehole **BH36**
Sheet 1 of 1

Borehole Log

Drilled by MC Logged by CH Checked by ROR	Start 10/12/2003 End 10/12/2003	Equipment, Methods and Remarks Dando Cable Percussion 200mm diameter 0.00m to 6.00m.	Depth from 0.00m to 6.00m Diameter 200mm Casing Depth	Ground Level +6.40 mOD Coordinates E 127534.20 National Grid N 228344.70

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			10/12/2003	0800
0.50-0.95	U 1	225 mm rec		
1.00	D 2			
1.50-2.00	B 3			
2.00	D 4			
2.50-3.50	P 5	500 mm rec		
3.50	D 6			
3.50-4.00	B 7			
4.50	D 8			
5.00-5.70	P 9	140 mm rec		
			10/12/2003	1800
6.00-6.04	SPT C	75 (25 for 20mm/75 for 20mm)		
6.00	D 10			

Depth	Type & No	Records	Date Casing	Time Water

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Dark brown non-fibrous plastic PEAT	(2.20)		
Uncompact creamy brown SILT with abundant shells and rare sand.	2.20 +4.20		
4.50 m Becoming grey mottled black SILT	(3.50)		
BOULDERS or ROCK** Recovered as subangular to subrounded fine to medium GRAVEL.	5.70 +0.70 (0.30)		
EXPLORATORY HOLE ENDS AT 6.00 m	6.00 +0.40		

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
3.50	6.00	In-situ vane Peak 23kPa, Residual 13kPa Encountered obstrution, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
5.70 -6.00	90 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (296). 10/03/2004 14:41:32

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

BH39

Sheet 1 of 1

Borehole Log

Drilled by	MC
Logged by	CH
Checked by	ROR

Start 08/12/2003
End 08/12/2003

Equipment, Methods and Remarks
Cable Percussion 200mm diameter from 0.0m to 4.00m.

Depth from	to	Diameter	Casing Depth
0.00m	2.00m	200mm	

Ground Level	+6.36 mOD
Coordinates	E 127591.06
National Grid	N 228328.15

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			08/12/2003	0800
0.50-0.95	U 1	3 blows		
1.00	D 2			
1.50-2.00	B 3			
			08/12/2003	1800
			1.50	
2.00-2.20	P 4	No recovery		
2.20	D 5		09/12/2003	0800
			1.70	
2.50-2.95	SPT C	N=73 (11,17/14,18,18,23)		
2.50-3.00	B 6			
3.00	D 7			
			09/12/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Dark brown pseudo-fibrous plastic PEAT	(2.00)		
Grey SILT**	2.00 +4.36		
Grey clayey sandy GRAVEL	2.20 +4.16		
	(0.80)		
ROCK or BOULDERS**	3.00 +3.36		
	(1.00)		
EXPLORATORY HOLE ENDS AT 4.00 m	4.00 +2.36		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	0.50	Rose to 0.30 m after 20 minutes.	-
2	3.00	Rose to 0.40 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
4.00		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
3.50 -3.70	60 mins	
4.00 -4.00	30 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 11/02/2004 15:31:07

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

BH41

Sheet 1 of 1

Borehole Log

Drilled by	MC
Logged by	CH
Checked by	ROR

Start	08/12/2003
End	08/12/2003

Equipment, Methods and Remarks
Cable Percussion 200mm diameter from 0.0m to 1.0m.

Depth from	to	Diameter	Casing Depth
0.00m	1.00m	200mm	

Ground Level	+6.73 mOD
Coordinates	E 127638.20
National Grid	N 228329.35

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			08/12/2003	0800
0.50-0.95 0.50-1.00	SPT C B 1	N=72 (3,4/7,17,18,30)		
			08/12/2003	1800
1.00	D 2			

Strata

Description		Depth,Level/ (Thickness)	Legend	Backfill/ Instruments
TOPSOIL**				
Dark grey slightly sandy slightly gravelly to gravelly CLAY	0.20-1.00 m Driller noted with cobbles	0.20 +6.53 (0.80)		
EXPLORATORY HOLE ENDS AT 1.00 m	1.00 m ROCK or BOULDERS	1.00 +5.73		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
1.00	-	No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
1.00 -1.00	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBII (296), 13/02/2004 17:57:56

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

BH44

Sheet 1 of 1

Borehole Log

Drilled by	MC
Logged by	CH
Checked by	ROR

Start 05/12/2003
End 05/12/2003

Equipment, Methods and Remarks
Cable Percussion 200mm diameter from 0.0m to 2.20m.

Depth from	to	Diameter	Casing Depth
0.00m	2.20m	200mm	

Ground Level	+6.92 mOD
Coordinates	E 127695.00
National Grid	N 228272.39

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			05/12/2003	0800
0.50-0.95	U 1	4 blows		
1.00	D 2			
1.50-1.95	SPT C	N=33 (1,2/5,6,8,14)		
1.50-2.00	B 3			
2.00	D 4		05/12/2003	1800
				1.90
2.20-2.31	SPT C	75 (25/75 for 30mm)		
2.20	D 5			

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
TOPSOIL**	(0.30)		
	0.30 +6.62		
PEAT**	(0.60)		
	0.90 +6.02		
Soft becoming very stiff grey slightly sandy gravelly CLAY. 0.90-2.20 m Driller noted with cobbles	(1.30)		
	2.20 +4.72		
EXPLORATORY HOLE ENDS AT 2.20 m. 2.20 m ROCK or BOULDERS			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.20	Rose to 1.90 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
2.20		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
2.20 -2.20	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 11/02/2004 15:32:02

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

BH50

Sheet 1 of 1

Borehole Log

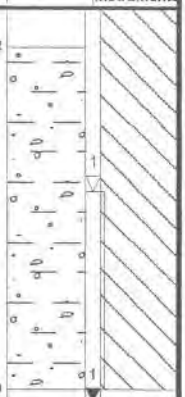
Drilled by MC Logged by CH Checked by ROR	Start 17/11/2003 End 17/11/2003	Equipment, Methods and Remarks Cable Percussion 200mm diameter from 0.0m to 2.5m.	Depth from 0.00m to 2.50m Diameter 200mm Casing Depth	Ground Level +7.39 mOD Coordinates E 127771.49 National Grid N 228260.51

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			17/11/2003	0800
0.50-0.95	U 1	41 blows		
1.00	D 2			
1.50-1.95	SPT C	N=27 (1,1/2,3,7,15)		
1.50-2.00	B 3			
2.00	D 4			
			17/11/2003	1800
2.50-2.55	SPT C	75 (25 for 20mm/75 for 30mm)		
2.50	D 5			

Strata

Description		Depth, Level (Thickness)	Legend	Backfill/ Instruments
TOPSOIL**		0.25 +7.14		
Soft becoming stiff grey brown slightly sandy slightly gravelly CLAY with some cobbles. Gravel is subangular to subrounded, fine to coarse. Cobbles are subangular to subrounded of limestone.	1.50 m Stiff	(2.25)		
EXPLORATORY HOLE ENDS AT 2.50 m	2.50 m Rock or boulder	2.50 +4.89		



Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.50	Rose to 1.20 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
2.50		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
2.50 -2.50	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBIII (298), 11/02/2004 15:02:30

AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

BH53

Sheet 1 of 1

Borehole Log

Drilled by MC Logged by CH Checked by ROR	Start 18/11/2003 End 18/11/2003	**Equipment, Methods and Remarks** Cable Percussion 200mm diameter from 0.0m to 1.50m. Borehole terminated due to boulders, moved and redrilled as BH55A.	Depth from 0.00m to 1.50m Diameter 200mm Casing Depth	Ground Level +6.74 mOD Coordinates E 127819.02 National Grid N 228260.97

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			18/11/2003	0800
0.50-0.90	U 1			
1.00	D 2			
			18/11/2003	1600

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
PEAT**	(0.35)		
	0.35 +6.39		
Firm grey slightly sandy slightly gravelly CLAY with cobbles. Gravel is subangular to subrounded, fine to coarse. Cobbles are of limestone.	(1.15)		
EXPLORATORY HOLE ENDS AT 1.50 m	1.50 +5.24		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
1.50		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
1.50 -1.50	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBill (286), 11/02/2004 15:02:58

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole: **BH55**

Sheet 1 of 1

Borehole Log

Drilled by	MC
Logged by	CH
Checked by	ROR

Start	18/11/2003
End	18/11/2003

Equipment, Methods and Remarks
Cable Percussion 200mm diameter from 0.0m to 2.80m.

Depth from	to	Diameter	Casing Depth
0.00m	2.80m	200mm	

Ground Level	+6.70 mOD
Coordinates	E 127822.65
National Grid	N 228260.42

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			18/11/2003	0800
2.00-2.45	SPT C	N=24 (1,2/5,6,6,7)		
2.00-2.50	B 1			
2.50	D 2			
			18/11/2003	1800
2.80-2.91	SPT C	75 (25/25 for 20mm)		
2.80	D 3			

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
PEAT**	(0.35) 0.35 +6.35		
Firm grey slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine to coarse. Cobbles are subangular of limestone.	(1.65) 2.00 +4.70		
Stiff grey slightly sandy gravelly CLAY with some subangular cobbles of limestone.	(0.80) 2.80 +3.90		
EXPLORATORY HOLE ENDS AT 2.80 m — 2.80 m Rock or Boulders			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.80	Rose to 1.30 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
0.00	2.00	Descriptions taken from BH55 samples.
2.80		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
2.80 -2.80	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (298), 11/02/2004 15:33:23

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole
BH55A
Sheet 1 of 1

Borehole Log

Drilled by MC Logged by CH Checked by ROR	Start 19/11/2003 End 19/11/2003	Equipment, Methods and Remarks Cable Percussion 200mm diameter from 0.0m to 2.0m.	Depth from 0.00m to 2.00m Diameter 200mm Casing Depth	Ground Level +6.56 mOD Coordinates E 127867.70 National Grid N 228233.63

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			19/11/2003	0800
0.50-0.95	U 1	3 blows		
1.00	D 2			
1.50-1.95	SPT C	N=61 (1,5/7,6,14,34)		
			19/11/2003	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Plastic dark brown to black pseudo fibrous PEAT	(1.40)		
BOULDERS**	1.40 +5.16		
EXPLORATORY HOLE ENDS AT 2.00 m	(0.60) 2.00 +4.56		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.50	Rose to 1.15 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
2.00		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
1.50 -2.00	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEXG HBIII (298), 11/02/2004 15:33:51 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

BH59

Sheet 1 of 1

Borehole Log

Drilled by MC Logged by CH Checked by ROR	Start 19/11/2003 End 19/11/2003	Equipment, Methods and Remarks Cable Percussion 200mm diameter from 0.0m to 3.50m.	Depth from 0.00m to 3.50m Diameter 200mm Casing Depth	Ground Level +6.45 mOD Coordinates E 127908.67 National Grid N 228208.24

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			19/11/2003	0800
0.80-1.25	U 1	4 blows		
1.30	D 2			
1.50-1.95 1.50-2.00	SPT C B 3	N=32 (2,7/6,6,9,11)		
2.00	D 4			
2.50-2.95 2.50-3.00	SPT C B 5	N=36 (1,5/9,6,7,14)		
3.00	D 6			
			19/11/2003	1800
3.50-3.55 3.50	SPT C D 7	75 (25 for 20mm/75 for 25mm)		

Strata

Description	Depth,Level (Thickness)	Legend	Backfill/ Instruments
Dark brown plastic non fibrous PEAT with some rootlets.	(1.30)		
Grey slightly silty sandy GRAVEL of limestone with some cobbles. Gravel is subangular coarse. Cobbles are subangular of limestone.	1.30 +5.15		
2.00 m PEAT	(2.20)		
EXPLORATORY HOLE ENDS AT 3.50 m 3.50 m Rock or Boulder	3.50 +2.95		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	3.50	Rose to 1.20 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
3.50		No advance on chiselling, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
3.50 -3.50	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (258), 11/02/2004 15:34:17

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

BH64

Sheet 1 of 1

Borehole Log

Drilled by	JC	Start	02/10/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+6.43 mOD
Logged by	JL	End	02/10/2003	Dando 3000 Cable Percussion 200mm diameter 0.00m to 5.23m.	0.00m	5.23m	200mm		Coordinates	E 128308.42
Checked by	ROR								National Grid	N 228096.68

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.50-1.00	B 1			
1.00-1.45 1.00-1.45	SPT S D 2	N=0 (-,-/-,-,-) SW=450		
1.50-2.00	B 3			
2.00-2.45 2.00-2.45	SPT S D 4	N=0 (-,-/-,-,-) SW=450	1.45	dry
2.50-3.00	B 5			
3.00-3.45 3.00-3.45	SPT S D 6	N=0 (-,-/-,-,-) SW=450	3.00	dry
3.50-4.00	B 7			
4.00-4.45 4.00-4.45	SPT S D 8	N=0 (-,-/-,-,-) SW=450	4.00	dry
4.80-5.20	B 9			
5.00-5.26	SPT C	50 (1,1/25,25 for 30mm)	5.00	dry
			5.20	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
TOPSOIl**	(0.30)		
Plastic dark brown to black amorphous PEAT with occasional rootlets and decaying grass.	0.30 +6.13		
	(4.50)		
Plastic dark brown to grey clayey amorphous PEAT. 4.80-5.23 m Driller noted soft grey SILT	4.80 +1.63		
	(0.43)		
EXPLORATORY HOLE ENDS AT 5.23 m	5.23 +1.20		SP

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	5.20	Rose to 2.60 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
5.23		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
5.20 -5.23	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEXICHILL (288), 11/02/2004 15:39:07 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole: **BH107**

Sheet 1 of 1

Borehole Log

Drilled by BJ Logged by JL Checked by ROR	Start 04/10/2003 End 05/10/2003	Equipment, Methods and Remarks Dando 175 Cable Percussion 200mm diameter 0.00m to 9.30m.	Depth from 0.00m to 9.30m Diameter 200mm Casing Depth	Ground Level +6.28 mOD Coordinates E 128354.70 National Grid N 228101.70

Samples and Tests

Depth	Type & No	Records	Date / Casing	Time / Water
0.00-0.50	B 1		04/10/2003	0800
0.50-0.95	SPT S	N=1 (1,-/-,-,1,-)		
0.50-1.00	B 3			
1.50-1.95	U 4	4 blows	1.50	dry
2.00-2.45	U 6	3 blows	2.00	dry
2.05	D 5			
2.55	D 7			
3.00-3.45	SPT S	N=1 (1,-/-,1,-,-)	3.00	dry
3.00-3.50	B 10			
3.50-4.50	P 11			
4.50-4.95	U 12	15 blows	4.50	0.00
5.05	D 13			
5.50-5.95	SPT S	N=0 (1,1/-,-,-,-)	5.50	0.20
5.50-6.00	B 15			
6.50-7.50	P 16		6.00	0.30
6.50-7.00	B 17			
			04/10/2003 7.50	1800 0.10
			05/10/2003 7.50	0800 0.40
8.50-8.95	SPT S	N=1 (1,-/-,-,1,-)	8.00	0.10
8.50-9.00	B 19			
9.10-9.23	SPT C	50 (25 for 30mm/50)	9.10	0.90
9.30-9.34	SPT C	50 (25 for 10mm/50 for 30mm)	05/10/2003 9.30	1800 1.30

Strata

Description	Depth, Level	(Thickness)
TOPSOIL**	0.10 +6.18	
Plastic dark brown to black amorphous PEAT.	0.50 +5.78	(0.40)
Spongy to plastic dark brown pseudofibrous PEAT with abundant rootlets and frequent grasses.	2.00 +4.28	(1.50)
Spongy dark brown pseudofibrous PEAT with abundant fibres / rootlets	3.00 +3.28	(1.00)
Plastic dark brown to black amorphous PEAT with occasional rootlets / fibres.	3.50 +2.78	(0.50)
Uncompact grey slightly sandy to sandy slightly gravelly organic CLAY. Sand is fine to medium.	5.00 +1.28	(1.50)
Uncompact grey organic SILT rare sand.	9.00 -2.72	(4.00)
GRAVEL**	9.10 -2.82	
LIMESTONE**	9.30 -3.02	

EXPLORATORY HOLE ENDS AT 9.30 m

Groundwater Entries

No. | Struck (m) | Post strike behaviour | Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
2.55		In-situ vane Peak 33kPa
3.00	7.50	Borehole kept full of water
5.05		In-situ vane Peak 25kPa
8.00		In-situ vane Peak 28kPa
9.30		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
9.10-9.30	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (2/98) 10/03/2004 14:42:25 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for: Galway County Council

Borehole **BH110**

Borehole Log

Drilled by	JC	Start	02/10/0030	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+7.37 mOD
Logged by	JL	End	02/10/2003	Dando 3000 Cable Percussion 200mm diameter 0.00m to 0.65m.	0.00m	0.65m	200mm		Coordinates	E 128406.23
Checked by	ROR								National Grid	N 228094.97

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			02/10/2003	0800
0.20-0.60	B 1			
			02/10/2003	1800
0.60-0.75	SPT C	50 (25/50)		

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
TOPSOIL**	0.20 +7.17		
Silty sandy GRAVEL with some cobbles. Cobbles are subangular to subrounded of limestone.	(0.45)		
EXPLORATORY HOLE ENDS AT 0.65 m	0.65 +6.72		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.65		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
0.60 -0.65	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG Hill (298), 11/02/2004 15:40:11

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

BH114

Sheet 1 of 1

Borehole Log

Drilled by BJ Logged by JL Checked by ROR	Start 07/10/2003 End 07/10/2003	Equipment, Methods and Remarks Dando 175 Cable Percussion 200mm diameter 0.00m to 9.20m.	Depth from 0.00m to 9.20m Diameter 200mm Casing Depth	Ground Level +6.24 mOD Coordinates E 129602.15 National Grid N 228148.16

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.50	B 1		07/10/2003	0800
0.50-0.76 0.50-1.00	SPT C B 3	64 (4,7/14,50 for 30mm)		
1.50-1.95 1.50-2.00	SPT C B 5	N=32 (6,8/9,7,9,7)	1.50	dry
2.50-2.95	U 6	10 blows	2.50	dry
3.05	D 7			
3.50-4.50 3.50-4.50	P 8 B 9	No recovery	3.50	dry
5.50-5.95 5.50-5.95 5.50-6.00	SPT S D 10 B 11	N=1 (1,-/-,1,-,-)	5.50	dry
7.50-8.50 7.50-8.50	P 12 B 13	No recovery	7.50	3.60
9.00-9.10	SPT C	50 (25 for 40mm/50 for 60mm)	9.00	4.90
9.20-9.25	SPT C	50 (25 for 10mm/50 for 40mm)	07/10/2003 ~~9.10~~	1800 ~~6.30~~

Strata

Description	Remarks	Depth, *Level* (Thickness)	Backfill/Instruments
TOPSOIL**		(0.40)	
GRAVEL with some cobbles. Gravel is subangular to rounded medium to coarse. Cobbles are subangular to subrounded of granite and limestone.	0.40-2.40 m Driller noted gravel with greyu silt	0.40 *+5.84* (2.00)	
Plastic dark brown and black amorphous PEAT.	3.50-4.50 m With occasional cobbles of granite	2.40 *+3.84* (2.10)	
Uncompact grey and brown slightly sandy SILT with occasional plant remains and frequent shells.		4.50 *+1.74* (3.00)	SP
Spongy grey brown organic SILT with frequent plant remains.		7.50 *-1.27* (1.30)	
GRAVEL**		8.80 *-2.57*	
LIMESTONE**		9.00 *-2.77*	
EXPLORATORY HOLE ENDS AT 9.25 m		9.25 *-3.02*	

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	7.50	Rose to 3.60 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
4.50		In-situ vane Peak 16kPa
6.50		In-situ vane Peak 13kPa
9.25		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
0.60 -0.75	30 mins	
8.80 -9.00	45 mins	
9.10 -9.20	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(a) MESG HBII (266) 10/03/2004 14:43:31 AGS

Project: NE Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole **BH145A**

Sheet 1 of 1

ENCLOSURE B
INSTRUMENTATION MONITORING & PERMEABILITY TESTS

Groundwater Monitoring

Permeability Tests

Groundwater Monitoring

GEOTECH

Hole No.	Instrument Type	Tip Depth (mBGL)	Reading				
			Date	Time (hhmmss)	Water Level (mBGL)	Head (m above Tip)	Comments
BH68	SPIE	9.00	02 Dec 2003		0.25	8.75	
BH68	SPIE	9.00	06 Dec 2003		0.16	8.84	
BH68	SPIE	9.00	11 Dec 2003		0.20	8.80	
BH68	SPIE	9.00	11 Feb 2004		0.20	8.80	
BH68	SPIE	9.00	14 Apr 2004		0.20	8.80	
BH107	SP	5.20	04 Nov 2003		0.38	4.82	
BH107	SP	5.20	06 Dec 2003		0.10	5.10	
BH107	SP	5.20	11 Feb 2004		0.15	5.05	
BH145A	SP	7.00	04 Nov 2003		0.45	6.55	
BH145A	SP	7.00	06 Dec 2003		0.20	6.80	
BH145A	SP	7.00	11 Feb 2004		0.00	7.00	
RC6A	SPIE	11.30	11 Feb 2004		2.01	9.29	
RC13	SP	15.00	04 Nov 2003		10.82	4.18	
RC13	SP	15.00	06 Dec 2003		11.83	3.17	
RC13	SP	15.00	11 Feb 2004		11.91	3.09	
RC13	SP	15.00	14 Apr 2004		11.60	3.40	
RC17	SP	10.00	11 Dec 2003		8.72	1.28	
RC17	SP	10.00	11 Feb 2004		7.70	2.30	
RC17	SP	10.00	14 Apr 2004		7.50	2.50	
RC28	SP	4.00	04 Nov 2003		1.70	2.30	
RC28	SP	4.00	06 Dec 2003		0.80	3.20	
RC28	SP	4.00	11 Feb 2004		0.80	3.20	
RC28	SP	4.00	14 Apr 2004		0.85	3.15	
RC49	SP	3.70	11 Dec 2003		0.50	3.20	
RC49	SP	3.70	11 Feb 2004		0.45	3.25	
RC49	SP	3.70	14 Apr 2004		0.40	3.30	
RC72	SP	14.00	17 Dec 2003		0.10	13.90	
RC72	SP	14.00	11 Feb 2004		0.00	14.00	
RC72	SP	14.00	14 Apr 2004		0.20	13.80	
RC97	SPIE	9.50	14 Apr 2004		2.35	7.15	
RC118	SPIE	11.00	04 Nov 2003		4.02	6.98	
RC118	SPIE	11.00	06 Dec 2003		3.87	7.13	
RC118	SPIE	11.00	11 Feb 2004		3.52	7.48	
RC118	SPIE	11.00	14 Apr 2004		3.45	7.55	
RC127	SP	3.00	06 Dec 2003		3.95	-0.95	Pipe damaged
RC127	SP	3.00	11 Feb 2004		3.32	-0.32	Pipe damaged, wl approx. 2m
RC129	SP	14.00	17 Dec 2003		6.80	7.20	
RC129	SP	14.00	11 Feb 2004		5.90	8.10	
RC133	SP	10.40	04 Nov 2003		4.22	6.18	
RC133	SP	10.40	06 Dec 2003		3.50	6.90	
RC133	SP	10.40	11 Feb 2004		4.19	6.21	
RC133	SP	10.40	14 Apr 2004		4.00	6.40	
RC138	SPIE	10.00	04 Nov 2003		5.60	4.40	
RC138	SPIE	10.00	06 Dec 2003		4.95	5.05	
RC138	SPIE	10.00	11 Feb 2004		5.52	4.48	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Sheet: Sheet 1 of 1

Groundwater Monitoring

Hole No.	Instrument Type	Tip Depth (mBGL)	Reading				
			Date	Time (hhmmss)	Water Level (mBGL)	Head (m above Tip)	Comments
BH68	SPIE	9.00	02 Dec 2003		0.25	8.75	
BH68	SPIE	9.00	06 Dec 2003		0.16	8.84	
BH68	SPIE	9.00	11 Dec 2003		0.20	8.80	
BH68	SPIE	9.00	11 Feb 2004		0.20	8.80	
BH107	SP	5.20	04 Nov 2003		0.38	4.82	
BH107	SP	5.20	06 Dec 2003		0.10	5.10	
BH107	SP	5.20	11 Feb 2004		0.15	5.05	
BH145A	SP	7.00	04 Nov 2003		0.45	6.55	
BH145A	SP	7.00	06 Dec 2003		0.20	6.80	
BH145A	SP	7.00	11 Feb 2004		0.00	7.00	
RC6A	SPIE	11.30	11 Feb 2004		2.01	9.29	
RC13	SP	15.00	04 Nov 2003		10.82	4.18	
RC13	SP	15.00	06 Dec 2003		11.83	3.17	
RC13	SP	15.00	11 Feb 2004		11.91	3.09	
RC17	SP	10.00	11 Dec 2003		8.72	1.28	
RC17	SP	10.00	11 Feb 2004		7.70	2.30	
RC28	SP	4.00	04 Nov 2003		1.70	2.30	
RC28	SP	4.00	06 Dec 2003		0.80	3.20	
RC28	SP	4.00	11 Feb 2004		0.80	3.20	
RC49	SP	3.70	11 Dec 2003		0.50	3.20	
RC49	SP	3.70	11 Feb 2004		0.45	3.25	
RC72	SP	14.00	17 Dec 2003		0.10	13.90	
RC72	SP	14.00	11 Feb 2004		0.00	14.00	
RC118	SPIE	11.00	04 Nov 2003		4.02	6.98	
RC118	SPIE	11.00	06 Dec 2003		3.87	7.13	
RC118	SPIE	11.00	11 Feb 2004		3.52	7.48	
RC127	SP	3.00	06 Dec 2003		3.95	-0.95	pipe damaged
RC127	SP	3.00	11 Feb 2004		3.32	-0.32	pipe damaged, wl approx 2.0m
RC129	SP	14.00	17 Dec 2003		6.80	7.20	
RC129	SP	14.00	11 Feb 2004		5.90	8.10	
RC133	SP	10.40	04 Nov 2003		4.22	6.18	
RC133	SP	10.40	06 Dec 2003		3.50	6.90	
RC133	SP	10.40	11 Feb 2004		4.19	6.21	
RC138	SPIE	10.00	04 Nov 2003		5.60	4.40	
RC138	SPIE	10.00	06 Dec 2003		4.95	5.05	
RC138	SPIE	10.00	11 Feb 2004		5.52	4.48	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation
Gortatleva to Menlough
Project No.: KC3210
Carried out for: Galway County Council

Sheet: Sheet 1 of 1

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 11/12/2003 End 12/12/2003	Equipment, Methods and Remarks C6 Rotary Open Hole 131mm diameter 0.00mm to 4.10m. Rotary Core 75mm diameter 4.10m to 10.30m. Borehole examined by televiewer.	Depth from / to / Diameter / Casing Depth 0.00m / 4.10m / 131mm 4.10m / 10.30m / 75mm	Ground Level +6.31 mOD Coordinates E 127502.50 National Grid N 228390.10

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			11/12/2003	0800
0.00-4.10	Rotary Open Hole Drilling			
4.10-5.60	89 89 82			
5.35		CS 1	11/12/2003 4.10	1800 0.00
			12/12/2003	0800
5.60-6.15 5.88-6.15	100 100 80	CS 2		
6.15-7.65	100 100 97	5 350 920		
7.65-9.15	100 93 93			
9.15-10.30	100 100 96			

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
PEAT**	(1.70)		
Light grey SILT/CLAY**	1.70 *+4.61* (1.00)		
CLAY**	2.70 *+3.61* (1.20)		
LIMESTONE**	3.90 *+2.41*		
Strong light grey fine grained crystalline LIMESTONE. WEATHERING: Slight with some minor discolouration and dissolution features on fracture surfaces. DISCONTINUITIES: Subhorizontal to subvertical closely to widely spaced planar to undulating smooth fractures 4.38 m Driller induced fracture 5.00-5.20 m Assessed zone of core loss 5.55 m Horizontal planar rough fracture 5.80 m 65° rough fracture 5.95-6.00 m Non-intact 6.39 m Rough undulating fracture 6.85 m 65° rough undulating fracture 7.65-7.75 m Non-intact 8.50 m Subvertical to 65° smooth fracture 9.40 m Subvertical to 65° smooth fracture 9.48 m Drilling Induced fracture at 9.48m and Stratum continued next sheet	4.10 *+2.21* (6.20)		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (298), 11/02/2004 11:07:47 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC35

Sheet 1 of 2

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 11/12/2003
End 12/12/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	4.10m	131mm	
4.10m	10.30m	75mm	

Ground Level +6.31 mOD
Coordinates E 127502.50
National Grid N 228390.10

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				12/12/2003	1800
				4.10	0.30

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong light grey fine grained crystalline LIMESTONE. 9.90m			
WEATHERING: Slight with some minor discolouration and dissolution features on fracture surfaces.			
DISCONTINUITIES: Subhorizontal to subvertical closely to widely spaced planar to undulating smooth fractures			
EXPLORATORY HOLE ENDS AT 10.30 m	10.30 -3.99		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG Hill (298), 11/02/2004 11:08:09

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC35
Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 10/12/2003 End 11/12/2003	Equipment, Methods and Remarks C6 Rotary Open Hole 131mm diameter 0.00m to 4.00m. Rotary Core 75mm diameter 4.00m to 10.10m.	Depth from 0.00m to 4.00m Diameter 131mm Casing Depth	Ground Level +6.26 mOD Coordinates E 127540.40 National Grid N 228357.10

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			10/12/2003	0800
0.00-4.00	Rotary Open Hole Drilling			
4.00-4.50	100 80 60			
4.50-5.00	100 100 100 NI 120 350		10/12/2003 4.00	1800 1.00
			11/12/2003 4.00	0800 0.00
5.00-5.60 5.40	50 33 17	CS 1		
5.60-7.10	100 100 100			
7.20		CS 2		
7.10-8.60	100 100 100 200 600 1000			
8.60-10.10	100 100 100			
			11/12/2003	1800

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
PEAT**	(2.40)		
Light grey CLAY**	2.40 +3.86		
Limestone GRAVEL with boulders**	2.60 +3.66 (1.40)		
Strong dark grey fine grained massive LIMESTONE. WEATHERING: Slight with no obvious loss of mass / wall strength observed. DISCONTINUITIES: Closely to widely spaced planar smooth to rough fractures. 4.50 m Non-intact 5.00 m 45° rough fracture 5.30-5.40 m Non-intact 6.40 m 35° rough fracture 6.50 m Smooth undulating fracture 7.00 m 45° smooth undulating fracture 8.60-10.10 m Solid stick of core 9.50 m Drilling induced fracture	4.00 +2.26 (6.10)		
Stratum continued next sheet			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.20	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBH (258). 11/02/2004 11:08:48 AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC38
Sheet 1 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 10/12/2003 End 11/12/2003	Equipment, Methods and Remarks	Depth from 0.00m to 4.00m Diameter 131mm Casing Depth	Ground Level +6.26 mOD Coordinates E 127540.40 National Grid N 228357.10

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong dark grey fine grained massive LIMESTONE. WEATHERING: Slight with no obvious loss of mass / wall strength observed. DISCONTINUITIES: Closely to widely spaced planar smooth to rough fractures. EXPLORATORY HOLE ENDS AT 10.10 m	10.10 -3.84		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (298), 11/02/2004 11:09:12 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

RC38

Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 09/12/2003 End 10/12/2003	Equipment, Methods and Remarks C6 Rotary Open Hole 131mm diameter 0.00m to 2.85m. Rotary Core 75mm diameter 2.85m to 11.05m.	Depth from to Diameter Casing Depth 0.00m 2.85m 131mm 2.85m 11.05m 75mm	Ground Level +6.27 mOD Coordinates E 127579.50 National Grid N 228321.70

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			09/12/2003	0800
0.00-2.85	Rotary Open Hole Drilling			
2.85-3.52	100 100 100			
3.60		CS 1		
3.52-4.81	100 100 100			
			09/12/2003 2.85	1800 1.00
			10/12/2003 2.85	0800 0.50
5.28-5.55		CS 2		
4.81-6.31	100 100 100			
6.31-7.81	100 100 100	190 350 1000		
7.95		CS 3		
7.81-8.45	100 100 100			
8.45-9.64	100 100 100			

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
PEAT**	(1.10)		
Grey CLAY / GRAVEL**	1.10 +5.17 (0.40)		1
Limestone GRAVEL with boulders**	1.50 +4.77 (1.35)		
Strong to very strong light grey fine grained massive fossiliferous LIMESTONE. WEATHERING: Fresh, no evidence of weathering observed. DISCONTINUITIES: Subhorizontal ranging from closely to widely spaced, predominantly medium spaced planar smooth to rough fractures. Many are drilling induced. 4.24 m Drilling induced fracture 4.71 m Subhorizontal drilling induced fracture 6.35 m 45° planar smooth fracture, clean 6.40 m <1mm calcite vein	2.85 +3.42 (8.20)		

Stratum continued next sheet

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.10	-	-

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 13/02/2004 10:15:18

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole **RC42**

Sheet 1 of 2

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 09/12/2003
End 10/12/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	2.85m	131mm	
2.85m	11.05m	75mm	

Ground Level +6.27 mOD
Coordinates E 127579.50
National Grid N 228321.70

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.64-11.05	100 100 84			10/12/2003	1800

Strata

Description	Depth,Level/ (Thickness)	Legend	Backfill/ Instruments
Strong to very strong light grey fine grained massive fossiliferous LIMESTONE. WEATHERING: Fresh, no evidence of weathering observed. DISCONTINUITIES: Subhorizontal ranging from closely to widely spaced, predominantly medium spaced planar smooth to rough fractures. Many are drilling induced. EXPLORATORY HOLE ENDS AT 11.05 m	11.05 -4.79		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (2/98), 13/02/2004 10:15:23

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC42
Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 03/12/2003 End 09/12/2003	Equipment, Methods and Remarks C6 Rotary Open Hole 131mm diameter 0.00m to 2.50m. Rotary Core 75mm diameter 2.50m to 10.40m.	Depth from / to / Diameter / Casing Depth 0.00m / 2.50m / 131mm 2.50m / 10.40m / 75mm	Ground Level +6.48 mOD Coordinates E 127833.93 National Grid N 228317.04

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-2.50	Rotary Open Hole Drilling		03/12/2003	0800
2.75	CS 1			
2.50-3.50	60 53 53 NI 130 190		03/12/2003 2.50	1800 0.50
3.50-3.70		TCR 100, SCR 100, RQD 75	09/12/2003 2.50	0800 0.50
3.80	CS 2			
4.00-4.50 3.70-4.54	CS 3 100 100 95			
4.54-6.12	100 100 100			
6.12-7.62	100 100 97 80 1000 1000			
7.62-9.12	100 100 100			
9.12-10.40	100 100 94			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description		Depth, Level (Thickness)	Legend	Backfill/ Instruments
Boulder CLAY / GRAVEL**		(2.50)		
		2.50 +3.98		
Strong dark grey fine grained crystalline LIMESTONE.	2.70 m 15° rough fracture			
WEATHERING: Fresh to very slight weathering with some iron staining from 2.50m to 2.90m with no loss of mass strength.	3.10 m 60° smooth fracture			
DISCONTINUITIES: Subhorizontal closely to widely spaced planar smooth to rough fractures.	3.70-3.80 m 2 no. 15° planar rough fractures			
	5.00 m Drilling induced fracture	(7.90)		
	7.12 m 35° planar rough fracture			
	9.40 m 45° planar smooth fracture			
Stratum continued next sheet				

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.80	-	-

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEXG HBIII (Z98). 13/02/2004 10:15:32

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC45

Sheet 1 of 2

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 03/12/2003
End 09/12/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	2.50m	131mm	
2.50m	10.40m	75mm	

Ground Level	+6.48 mOD
Coordinates	E 127633.93
National Grid	N 228317.04

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				09/12/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong dark grey fine grained crystalline LIMESTONE. WEATHERING: Fresh to very slight weathering with some iron staining from 2.50m to 2.90m with no loss of mass strength. DISCONTINUITIES: Subhorizontal closely to widely spaced planar smooth to rough fractures. EXPLORATORY HOLE ENDS AT 10.40 m	10.40 -3.92		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG Hill (298), 13/02/2004 10:15:37

AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.: KC3210
Carried out for: Galway County Council

Borehole
RC45
Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 03/12/2003 End 03/12/2003	Equipment, Methods and Remarks C8 Rotary Open Hole 131mm diameter 0.00m to 2.50m. Rotary Core 75mm diameter 2.50m to 10.50m.	Depth from / to / Diameter / Casing Depth 0.00m / 2.50m / 131mm 2.50m / 10.50m / 75mm	Ground Level +7.11 mOD Coordinates E 127702.90 National Grid N 228283.96

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-2.50	Rotary Open Hole Drilling		03/12/2003	0800
2.62 2.50-3.17	100 100 90	CS 1		
3.17-4.53	97 97 97			
4.05-4.37		CS 2		
4.53-5.10	100 100 88	NI 300 420		
5.30 5.10-5.68	100 86 69	CS 3		
5.68-6.00	100 84 84			
6.00-7.50	100 100 87			
7.50-9.00	100 100 100	270 1000 1900		
9.00-10.50	100 100 100			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Boulder CLAY GRAVEL**	(2.50)		
Strong dark grey fine grained crystalline LIMESTONE.	2.50 +4.61		
WEATHERING: Fresh to slight with no apparent loss of mass or wall strength, some minor dissolution features on some fracture surfaces.			
DISCONTINUITIES: Subhorizontal to subvertical closely to widely spaced fractures, locally some clay infilling.			
3.15-3.20 m Non-intact			
3.47 m 45° smooth fracture			
4.10 m 40° smooth fracture			
4.70 m 75° smooth fracture			
5.50-5.60 m Non-intact, clay infilled fracture			
5.90-6.00 m Non-intact			
6.00-6.50 m Vertical rough fracture	(8.00)		
7.00 m Drilling induced fracture			
7.50-9.50 m Solid core, no fractures			
8.50 m Drilling induced fracture			
9.00 m Drilling induced fracture			
9.50 m 45° fracture			
Stratum continued next sheet			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.00	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBIII (398), 11/02/2004 11:11:53

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.: KC3210
Carried out for: Galway County Council

Borehole
RC49
Sheet 1 of 2

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 03/12/2003
End 03/12/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	2.50m	131mm	
2.50m	10.50m	75mm	

Ground Level +7.11 mOD
Coordinates E 127702.90
National Grid N 228283.96

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				03/12/2003 2.50	1800 1.00

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong dark grey fine grained crystalline LIMESTONE. WEATHERING: Fresh to slight with no apparent loss of mass or wall strength, some minor dissolution features on some fracture surfaces. DISCONTINUITIES: Subhorizontal to subvertical closely to widely spaced fractures, locally some clay infilling. 10.50 m 45° clay infilled fracture, with some dissolution features on fracture walls EXPLORATORY HOLE ENDS AT 10.50 m	10.50 -3.39		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (296), 11/02/2004 11:12:17

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC49
Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 01/12/2003 End 02/12/2003	Equipment, Methods and Remarks C6 Rotary Open Hole 131mm diameter 0.00m to 2.70m. Rotary Core 75mm diameter 2.70m to 10.25m. Borehole examined using televiewer.	Depth from / to / Diameter / Casing Depth 0.00m / 2.70m / 131mm 2.70m / 10.25m / 75mm	Ground Level +7.38 mOD Coordinates E 127773.30 National Grid N 228273.80

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			01/12/2003	0800
0.00-2.70	Rotary Open Hole Drilling			
2.80	100	CS 1		
2.70-3.28	100 100			
3.55	100	CS 2		
3.28-4.15	98			
3.75-4.15	79	CS 3		
			01/12/2003	1800
			2.70	1.00
	100		02/12/2003	0800
4.15-4.50	100 100		2.70	0.50
4.50-5.70	100 100 93			
5.70-7.00	98 98 98	80 450 600		
7.00-8.02	100 100 100			
8.02-9.00	100 100 88			
9.00-10.25	100 100 100			

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Boulder CLAY GRAVEL**	(2.70)		
Strong dark grey fine grained laminated fossiliferous LIMESTONE.	2.70 +4.68		
WEATHERING: Fresh			
DISCONTINUITIES: Subhorizontal (0° - 30°) medium spaced planar rough fractures, clean.			
3.28-3.38 m 2 no.closely spaced fractures, possibly drilling induced			
4.45 m Subhorizontal drilling induced fracture			
4.90 m Subhorizontal fracture with some slight clay smearing	(7.55)		
6.90 m Subhorizontal drilling induced fracture			
7.30 m 35° planar rough fracture			
8.00 m 60° rough fracture, clean			
8.65 m 10° rough fracture			
9.00-9.05 m Drilling induced conjugate fractures			
9.70 m 70° rough fracture, clay smeared			
Stratum continued next sheet			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.00	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBill (295), 11/02/2004 11:12:57

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.: KC3210
Carried out for: Galway County Council

Borehole
RC52
Sheet 1 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 01/12/2003 End 02/12/2003	Equipment, Methods and Remarks	Depth from / to / Diameter / Casing Depth 0.00m 2.70m 131mm 2.70m 10.25m 75mm	Ground Level +7.38 mOD Coordinates E 127773.30 National Grid N 228273.80

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				02/12/2003	1800

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Strong dark grey fine grained laminated fossiliferous LIMESTONE. WEATHERING: Fresh DISCONTINUITIES: Subhorizontal (0° - 30°) medium spaced planar rough fractures, clean.	10.25 -2.87		
EXPLORATORY HOLE ENDS AT 10.25 m			

Groundwater Entries
No. Struck (m) Post strike behaviour Depth sealed (m)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBII (296), 11/02/2004 11:13:21 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole **RC52**
Sheet 2 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 28/11/2003 End 01/12/2003	Equipment, Methods and Remarks	Depth from / to / Diameter / Casing Depth 0.00m / 3.50m / 131mm 3.50m / 10.50m / 75mm	Ground Level +6.97 mOD Coordinates E 127819.40 National Grid N 228248.30

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.77-10.50	95 95 95			01/12/2003	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Strong dark grey fine grained occasional laminated LIMESTONE. fracture, assessed zone of core loss WEATHERING: Fresh to very slight weathering. DISCONTINUITIES: Subhorizontal closely to medium spaced planar rough fractures, clean. EXPLORATORY HOLE ENDS AT 10.50 m	10.50 -3.53		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEDG Hill (298) 11/02/2004 11:19:58

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole: RC57

Borehole Log

Drilled by MC Logged by CH Checked by ROR	Start 19/11/2003 End 19/11/2003	Equipment, Methods and Remarks Cable Percussion 200mm diameter from 0.0m to 2.0m.	Depth from 0.00m to 2.00m Diameter 200mm Casing Depth	Ground Level +6.56 mOD Coordinates E 127867.70 National Grid N 228233.63

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			19/11/2003	0800
0.50-0.95	U 1	3 blows		
1.00	D 2			
1.50-1.95	SPT C	N=61 (1,5/7,6,14,34)		
			19/11/2003	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Plastic dark brown to black pseudo fibrous PEAT	(1.40)		
BOULDERS**	1.40 +5.16		
EXPLORATORY HOLE ENDS AT 2.00 m	(0.60) 2.00 +4.56		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.50	Rose to 1.15 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
2.00		Encountered obstruction, borehole terminated.

Chiselling

Depths (m)	Time	Tools used
1.50 -2.00	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEXG HBIII (298), 11/02/2004 15:33:51 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole

BH59

Sheet 1 of 1

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 12/12/2003 End 13/12/2003	Equipment, Methods and Remarks C8 Rotary Open Hole 131mm diameter 0.00m to 5.60m. Rotary Core 75mm diameter 5.60m to 12.00m. Borehole examined by televiewer.	Depth from / to / Diameter / Casing Depth 0.00m / 5.60m / 131mm 5.60m / 12.00m / 75mm	Ground Level +6.61 mOD Coordinates E 127864.60 National Grid N 228222.50

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			12/12/2000	0800
0.00-5.60	Rotary Open Hole Drilling			
			12/12/2003	1800
			5.60	0.10
			13/12/2003	0800
			5.60	0.10
6.25-6.70		CS 1		
5.60-7.50	95 74 56	NI 460 460		
7.65		CS 2		
7.50-9.00	100 100 47			
9.00-10.50	100 100 100			

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
PEAT**	(1.70)		
CLAY GRAVEL**	1.70 +4.91		
	(0.40)		
Stiff grey CLAY GRAVEL**	2.10 +4.51		
	(3.50)		
Strong fine grained light grey crystalline LIMESTONE WEATHERING: Slight with no obvious alteration or loss of wall strength. DISCONTINUITIES: Horizontal or subvertical medium becoming widely spaced planar smooth to rough fractures, clean. 6.30-6.90 m 80° smooth fracture 7.50 m Drilling induced fracture 7.80-8.40 m Many random undulating rough fractures producing non-intact core	5.60 +1.01		
	(6.40)		
Stratum continued next sheet			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.60	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (288), 13/02/2004 18:00:58

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC60
Sheet 1 of 2

Borehole Log

Drilled by MN Logged by CH Checked by ROR	Start 12/12/2003 End 13/12/2003	Equipment, Methods and Remarks	Depth from / to / Diameter / Casing Depth 0.00m / 5.60m / 131mm 5.60m / 12.00m / 75mm	Ground Level +6.61 mOD Coordinates E 127864.60 National Grid N 228222.50

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
		460 700 955			
10.50-12.00	100 100 100			13/12/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong fine grained light grey crystalline LIMESTONE WEATHERING: Slight with no obvious alteration or loss of wall strength. DISCONTINUITIES: Horizontal or subvertical medium becoming widely spaced planar smooth to rough fractures, clean.			
EXPLORATORY HOLE ENDS AT 12.00 m	12.00 -5.39		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBEI (298), 13/02/2004 15:01:01

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole: **RC60**

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 17/12/2003
End 17/12/2003

Equipment, Methods and Remarks
C6
Rotary Open Hole 131mm diameter 0.00m to 5.00m. Rotary Core 75mm diameter 5.00m to 11.70m.

Depth from	to	Diameter	Casing Depth
0.00m	5.00m	131mm	
5.00m	11.70m	75mm	

Ground Level	+6.54 mOD
Coordinates	E 127915.02
National Grid	N 228222.50

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			17/12/2003	0800
0.00-5.00	Rotary Open Hole Drilling			
5.45 5.00-6.00	100 100 90	CS 1		
6.00-7.25	100 100 100			
7.05		CS 2		
7.25-8.75	100 100 80			
8.35-8.75	70 450 600	CS 3		
8.75-10.25	100 100 100			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
PEAT**	(2.60)		
GRAVEL CLAY**	2.60 +3.94 (2.40)		
Strong light grey fine grained crystalline LIMESTONE WEATHERING: Slight with no obvious dissolution or loss of strength. DISCONTINUITIES: Subhorizontal to subvertical closely to medium spaced planar rough to smooth fractures. 6.00 m Clay infilled fracture 6.25 m 25° rough fracture 7.18 m 25° rough fracture 7.80 m 45° smooth fracture 8.10 m 25° clay infilled fracture 8.65 m Drilling induced fracture 9.75 m 70° clay smeared fracture	5.00 +1.54 (6.70)		
Stratum continued next sheet			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.80	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (296), 11/02/2004 11:21:35

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole
RC63
Sheet 1 of 2

Borehole Log

Drilled by	MN
Logged by	CH
Checked by	ROR

Start 17/12/2003
End 17/12/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	5.00m	131mm	
5.00m	11.70m	75mm	

Ground Level +6.54 mOD
Coordinates E 127915.02
National Grid N 228222.50

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.25-11.70	100 100 100			17/12/2003 5.00	1800 0.50

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong light grey fine grained crystalline LIMESTONE 10.25 m 70° incipient fracture WEATHERING: Slight with no obvious dissolution or loss of strength. DISCONTINUITIES: Subhorizontal to subvertical closely to medium spaced planar rough to smooth fractures.			
EXPLORATORY HOLE ENDS AT 11.70 m	11.70 -5.16		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (2K6), 11/02/2004 11:21:55

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC63
Sheet 2 of 2

Borehole Log

Drilled by AC Logged by JL Checked by ROR	Start 08/10/2003 End 08/10/2003	Equipment, Methods and Remarks Hilltwister Rotary Core 55mm diameter 0.00m to 16.0m	Depth from 0.00m to 16.00m, Diameter 65mm, Casing Depth	Ground Level +6.57 mOD Coordinates E 128307.00 National Grid N 228114.60

Samples and Tests / Strata

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Description	Depth, *Level* (Thickness)	Legend	Backfill/Instruments
				08/10/2003	0800	PEAT**			
0.00-1.00	0 N/A N/A		No Recovery						
1.00-2.50	0 N/A N/A		No Recovery						
							(5.20)		
2.50-4.00	0 N/A N/A		No Recovery						
4.00-5.50	0 N/A N/A		No Recovery						
						Soft grey silty CLAY**	5.20 *+1.37*		
5.50-7.00	0 N/A N/A		No Recovery						
							(4.00)		
7.00-8.50	0 N/A N/A		No Recovery						
						Limestone BOULDERS.	9.20 *-2.63*		
8.50-10.00	53 N/A N/A						(0.80)		
9.72			CS 1						

Stratum continued next sheet

Groundwater Entries	Depth Related Remarks	Chiselling
No. Struck (m) Post strike behaviour Depth sealed (m) None observed (see Key Sheet)	From to (m)	Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBR (298), 18/02/2004 09:59:02 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole **RC106**

Borehole Log

Drilled by AC Logged by JL Checked by ROR	Start 08/10/2003 End 08/10/2003	Equipment, Methods and Remarks	Depth from 0.00m to 16.00m Diameter 65mm Casing Depth	Ground Level +6.57 mOD Coordinates E 128307.00 National Grid N 228114.60

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.00-11.50	20 N/A N/A				
11.50-13.00	37 30 30				
13.00-13.63			CS 2		
13.00-14.50	65 65 65	NI 260 400			
14.50-16.00	0 N/A N/A		No Recovery	08/10/2003	1800

Strata

Description		Depth, Level (Thickness)	Legend	Backfill/ Instruments
Possible BOULDERS** Recovered as medium to coarse subangular to subrounded GRAVEL of limestone. Poor recovery.		10.00 -3.43		
		(2.55)		
Strong grey fine grained slightly fossiliferous LIMESTONE with occasional calcite veins. WEATHERING: Slight solution features on exposed surfaces. DISCONTINUITIES: 0° -10° closely to medium spaced rough to smooth fractures	12.60-14.50 m Driller noted weathered rock with clay bands 12.75-13.00 m 70-75° undulating rough fracture	12.55 -5.98		
		(1.95)		
CAVITY infilled with very soft SILT**	14.37-14.50 m Subvertical undulating rough to smooth fracture with grey brown sandy gravelly clay smear.	14.50 -7.93		
		(1.50)		
EXPLORATORY HOLE ENDS AT 16.00 m		16.00 -9.43		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (268), 16/02/2004 09:59:06 AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole

RC106

Sheet 2 of 2

Borehole Log

Drilled by MN Logged by Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks Open Hole Drilling 131mm diameter from 0.0m to 27.0m.	Depth from 0.00m to 27.00m Diameter 131mm Casing Depth	Ground Level +6.57 mOD Coordinates E 128307.45 National Grid N 228115.98

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			07/11/2003	0800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
PEAT**	(8.00)		1
Grey CLAY with gravel**	8.00 -1.43 (1.70)		
Stratum continued next sheet	9.70 -3.13		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.00	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (298), 28/01/2004 14:17:46 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole
RC106A
Sheet 1 of 3

Borehole Log

Drilled by MN	Start 07/11/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+6.57 mOD
Logged by	End		0.00m	27.00m	131mm		Coordinates	E 128307.45
Checked by ROR	07/11/2003						National Grid	N 228115.98

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-27.00	Rotary Open Hole Drilling			
14.70-15.08	SPT S	50 (2,9/18,30,2)	14.70	2.00
16.20-16.65	SPT S	N=50 (5,7/8,9,18,15)	16.20	2.00
19.20-19.53	SPT S	50 (12,12/17,18,15 for 25mm)	19.20	2.00

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Grey boulder CLAY**	(0.70)		
	10.40 -3.83		
Loose BOULDERS**	(1.20)		
	11.60 -5.03		
Boulder CLAY**	(1.60)		
	13.20 -6.63		
Black CLAY**	(1.50)		
	14.70 -8.13		
White SAND**	(2.30)		
	17.00 -10.43		
Brown SAND**	(2.20)		
	19.20 -12.63		
Coarse white SAND**			
Stratum continued next sheet			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBW (2/8), 28/01/2004 14:17:48

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole

RC106A

Sheet 2 of 3

Borehole Log

Drilled by MN Logged by Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks	Depth from to Diameter Casing Depth 0.00m 27.00m 131mm	Ground Level +6.57 mOD Coordinates E 128307.45 National Grid N 228115.98

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			07/11/2003	1800 0.50

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Coarse white SAND**	(1.60)		
	20.80 -14.23		
Brown CLAY**	(2.90)		
	23.70 -17.13		
Brown SAND**	(3.30)		
EXPLORATORY HOLE ENDS AT 27.00 m	27.00 -20.43		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEGG HBIII (298), 28/01/2004 14:17:52 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC106A

Sheet 3 of 3

Borehole Log

Drilled by TB Logged by Checked by ROR	Start 22/10/2003 End 22/10/2003	Equipment, Methods and Remarks Open Hole 131mm diameter from 0.0m to 20.0m.	Depth from 0.00m to 20.00m Diameter 131mm Casing Depth	Ground Level +6.33 mOD Coordinates E 128349.60 National Grid N 228088.20

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			22/10/2003	0800

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Hard stiff brown CLAY**	(15.00)		1
Stratum continued next sheet			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	8.00	-	-

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBR (285), 28/01/2004 14:16:02

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC111
Sheet 1 of 2

Borehole Log

Drilled by TB Logged by Checked by ROR	Start 22/10/2003 End 22/10/2003	Equipment, Methods and Remarks	Depth from 0.00m to 20.00m Diameter 131mm Casing Depth	Ground Level +6.33 mOD Coordinates E 128349.60 National Grid N 228088.20

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-20.00	Rotary Open Hole Drilling			
			22/10/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Hard stiff brown CLAY**			
White SAND**	15.00 -8.67		
	(4.00)		
Hard brown CLAY**	19.00 -12.67		
	(1.00)		
EXPLORATORY HOLE ENDS AT 20.00 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 28/01/2004 14:18:05

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No.: KC3210

Carried out for: Galway County Council

Borehole: **RC111**

Borehole Log

Drilled by AC Logged by JL Checked by ROR	Start 09/10/2003 End 09/10/2003	Equipment, Methods and Remarks Hilltwister Rotary Core 65mm diameter 0.00m to 14.50m.	Depth from 0.00m to 14.50m, Diameter 65mm, Casing Depth	Ground Level +7.21 mOD Coordinates E 128401.80 National Grid N 228088.20

Samples and Tests / Strata

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
				09/10/2003	0800	PEAT**	(0.30) 0.30 +6.91		
0.00-1.00	0 0 0		No recovery			Grey brown sandy gravelly CLAY with boulders**			
						1.00-1.63 m Recovered as subrounded coarse GRAVEL of limestone	(2.00)		
1.00-2.50	86 13 13					1.63-2.30 m Recovered as limestone COBBLES.	2.30 +4.91		
2.50-2.88			CS 1			Strong grey fine grained slightly fossiliferous LIMESTONE with occasional clay bands between 5.50m and 10.00m.			
3.00			CS 2			WEATHERING: Occasional dissolution features on fracture surfaces, penetrating up to 40mm, resulting in small voids and localised brown discolouration. No loss in strength.			
2.50-4.00	95 93 93					DISCONTINUITIES: 20 - 45° closely to medium spaced smooth planar fractures, often with calcite on fracture surfaces and 0° - 10° subhorizontal closely spaced smooth planar and undulating fractures. 3.49-3.68 m 70° smooth undulating fracture with calcite on surface 3.69-3.80 m Non-intact, recovered as angular coarse gravel, assessed zone of core loss			
4.00-5.50	100 100 80					4.54-4.61 m 60° smooth planar fracture with calcite on surface			
5.50-7.00	94 74 61					5.56-5.68 m Orange to light brown slightly sandy CLAY (up to 150mm) 5.68-5.91 m Non-intact. Assessed zone of core loss			
7.00-8.50	61 61 61	NI 360 670				7.46-7.65 m Assessed zone of core loss 8.10-8.50 m Assessed zone of core loss	(12.20)		
8.50-10.00	51 41 31					8.73-9.47 m Assessed zone of core loss 9.31-9.46 m Orange to light brown slightly sandy CLAY (up to 150mm)			
Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water				

Stratum continued next sheet

Groundwater Entries	Depth Related Remarks	Chiselling
No. Struck (m) Post strike behaviour Depth sealed (m)	From to (m)	Depths (m) Time Tools used
None observed (see Key Sheet)		

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (2981, 18/02/2004 09:58:23

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough	Borehole
Project No.	KC3210	RC115
Carried out for	Galway County Council	Sheet 1 of 2

Borehole Log

Drilled by AC Logged by JL Checked by ROR	Start 09/10/2003 End 09/10/2003	Equipment, Methods and Remarks	Depth from 0.00m to 14.50m Diameter 65mm Casing Depth	Ground Level +7.21 mOD Coordinates E 128401.80 National Grid N 228088.20

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.00-11.50	100 97 97				
11.50-13.00	100 100 96				
13.00-14.50	100 100 100			09/10/2003	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Strong grey fine grained slightly fossiliferous LIMESTONE with occasional clay bands between 5.50m and 10.00m. WEATHERING: Occasional dissolution features on fracture surfaces, penetrating up to 40mm, resulting in small voids and localised brown discolouration. No loss in strength. DISCONTINUITIES: 20 - 45° closely to medium spaced smooth planar fractures, often with calcite on fracture surfaces and 0° - 10° subhorizontal closely spaced smooth planar and undulating fractures.			
EXPLORATORY HOLE ENDS AT 14.50 m	14.50 -7.29		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
14.50		Unable to backreaming rods, cut off rods at ground level.

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298): 16/02/2004 09:59:30

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC115

Sheet 2 of 2

Borehole Log

Drilled by Hillards Logged by SL Checked by ROR	Start 20/10/2003 End 21/10/2003	Equipment, Methods and Remarks Rotary Cored 65mm diameter from 0.0m to 14.50m.	Depth from 0.00m to 14.50m Diameter 65mm Casing Depth	Ground Level +10.12 mOD Coordinates E 128452.80 National Grid N 228086.90

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				20/10/2003	0800
0.00-1.00	50 0 0				
1.15-1.34			CS 1		
1.00-2.50	60 37 29				
2.23			CS 2		
3.22			CS 3		
2.50-4.00	91 86 82				
4.00-5.50	95 79 79				
				20/10/2003	1800
				21/10/2003	0800
5.50-7.00	99 89 86				
		NI 250 870			
7.00-8.50	99 99 99				
8.50-10.00	96 85 55				

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
SILT and BOULDERS** Recovered as coarse angular to subrounded limestone gravel, assessed zone of core loss	(0.80)		
	0.80 +9.32		
Moderate strong to strong grey crystalline fine grained fossiliferous LIMESTONE with occasional stylolites. WEATHERING: Fresh to slight brown discolouration on fracture surfaces. DISCONTINUITIES Subhorizontal to 10° very closely to widely predominately medium spaced planar smooth to rough fractures.	(13.70)		

Fracture notes:
- 1.04 m 45-55° planar smooth fracture with light brown clay smear
- 1.08 m 45-55° planar smooth fracture with light brown clay smear
- 2.00 m 45-55° possibly producing some non intact, assessed zone of core loss
- 2.33-2.40 m Subvertical planar stepped fracture
- 3.80 m 45-55° planar smooth fracture with light brown clay smear
- 4.60 m 55-60° planar smooth fracture
- 5.15-5.37 m 55-60° planar smooth fracture
- 7.10 m Incipient 45-55° fracture
- 7.53 m 45-55° planar smooth fracture
- 8.57 m 45-55° planar smooth fracture
- 9.40 m 60° planar smooth fracture with light brown clay smear on surface

Stratum continued next sheet

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries
No. Struck (m) Post strike behaviour Depth sealed (m)
None observed (see Key Sheet)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBII (298), 05/02/2004 13:24:17 AGS

Project: N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole RC118

Borehole Log

Drilled by	Hillard
Logged by	SL
Checked by	ROR

Start	20/10/2003
End	21/10/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	14.50m	65mm	

Ground Level	+10.12 mOD
Coordinates	E 128452.80
National Grid	N 228086.90

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.00-13.00	50 40 40				
13.00-14.50	100 97 97			21/10/2003	1800

Strata

Description		Depth, Level (Thickness)	Legend	Backfill/ Instruments
Moderate strong to strong grey crystalline fine grained fossiliferous LIMESTONE with occasional stylolites.				
WEATHERING: Fresh to slight brown discolouration on fracture surfaces.				
DISCONTINUITIES Subhorizontal to 10° very closely to widely predominately medium spaced planar smooth to rough fractures.	10.30 m 45-55° planar smooth fracture 10.60-10.90 m Subvertical planar stepped smooth fracture possibly produced some non intact, assessed zone of core loss. 11.65-12.00 m Non Intact: Recovered as coarse angular limestone gravel 14.20-14.27 m 55-60° planar smooth fracture with brown discolouration on surface			SPIE
EXPLORATORY HOLE ENDS AT 14.50 m		14.50 -4.39		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG NBIII (298), 05/02/2004 13:24:22

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC118

Sheet 2 of 2

Borehole Log

Drilled by	TB
Logged by	JL
Checked by	ROR

Start	07/10/2003
End	08/10/2003

Equipment, Methods and Remarks
Soil Mech
Rotary Open Hole 100mm diameter 0.00m to 1.05m. Rotary Core 65mm diameter 1.05m to 12.30m. Borehole examined using televiewer.

Depth from	to	Diameter	Casing Depth
0.00m	1.05m	100mm	
1.05m	12.30m	65mm	

Ground Level	+16.44 mOD
Coordinates	E 128583.50
National Grid	N 228031.20

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			07/10/2003	0800
0.00-1.05	Rotary Open Hole Drilling			
1.05-1.70	100 71 29			
1.70-2.75	97 86 74 NI 110 260			
2.75-3.60 3.20	98 91 87	CS 1		
3.85-4.30		CS 2		
3.60-5.10	98 98 98			
5.10-6.60	87 87 87			
6.60-8.10 7.55	100 96 77	CS 3		
	NI 500 1150			
8.10-9.15	97 97 95	Slipped Core		
9.15-10.10	100 100 67	Slipped Core		

Strata

Description	Depth, Level (Thickness)
Boulder CLAY**	(0.80)
	0.80 +15.64
LIMESTONE**	
	1.05 +15.39
Strong grey fine grained LIMESTONE WEATHERING: Slight solution features on occasional fracture surfaces. DISCONTINUITIES: 1.05m - 3.60m: 0 - 20° very closely to medium spaced predominantly closely spaced smooth undulating smooth fractures. 3.60m - 12.30m: 0 -20° very closely to widely spaced, predominantly medium spaced smooth undulating fractures.	
1.09-1.19 m 50° smooth undulating fracture 1.28-1.37 m Non-intact	
2.70-2.75 m 45° smooth undulating fracture 2.75-2.78 m Non-intact 3.03-3.44 m 80° smooth planar fracture with abundant calcite on fracture surface	
4.82-4.87 m 40° smooth undulating fracture 5.17-5.24 m 50° smooth planar fracture 5.43-5.60 m 3 No 45° fractures all displaying slight calcite mineralisation on fracture surfaces	
6.56-6.60 m 40° smooth planar fracture	(11.25)
7.88-7.90 m Non-intact	
9.84-9.90 m 45° smooth planar	
Stratum continued next sheet	

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 11/02/2004 11:32:05

Project	N6 Galway City Outer Bypass Contract 2 Ground investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole
RC122
Sheet 1 of 2

Borehole Log

Drilled by TB Logged by JL Checked by ROR	Start 07/10/2003 End 08/10/2003	Equipment, Methods and Remarks	Depth from / to / Diameter / Casing Depth 0.00m 1.05m 100mm 1.05m 12.30m 65mm	Ground Level +16.44 mOD Coordinates E 128583.50 National Grid N 228031.20

Samples and Tests / Strata

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
				07/10/2003 1.05	1800 dry	Strong grey fine grained LIMESTONE WEATHERING: Slight solution features on occasional fracture surfaces. DISCONTINUITIES: 1.05m - 3.60m: 0 - 20° very closely to medium spaced predominantly closely spaced smooth undulating smooth fractures. 3.60m - 12.30m: 0 -20° very closely to widely spaced, predominantly medium spaced smooth undulating fractures. fracture with calcite on surface 10.06-10.10 m 35° smooth undulating fracture with calcite on fracture surface 10.48-10.50 m Non-intact.			
10.10-11.60	100 99 75			08/10/2003 1.05	0800				
11.60-12.30	100 100 100			08/10/2003 1.05	1800 dry		12.30 *+4.14*		
						EXPLORATORY HOLE ENDS AT 12.30 m			

Groundwater Entries No. Struck (m) Post strike behaviour Depth sealed (m)	Depth Related Remarks From to (m)	Chiselling Depths (m) Time Tools used
None observed (see Key Sheet)		

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298), 11/02/2004 11:32:29 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough	Borehole
Project No.	KC3210	**RC122**
Carried out for	Galway County Council	Sheet 2 of 2

Borehole Log

Drilled by TB Logged by JL Checked by ROR	Start 09/10/2003 End 09/10/2003	Equipment, Methods and Remarks Soil Mech Rotary Open Hole 131 diameter 0.00m to 0.90m. Rotary Core 66mm diameter 0.90m to 10.70m. Borehole examined using televiewer.	Depth from / to / Diameter / Casing Depth 0.00m / 0.90m / 131mm 0.90m / 10.70m / 66mm	Ground Level +16.03 mOD Coordinates E 128748.72 National Grid N 228019.54

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.90	Rotary Open Hole Drilling		09/10/2003	0800
0.90-1.70	84 60 34 / NI 60 160			
1.85		CS 1		
1.70-3.00	100 100 91			
3.00-4.50	100 100 96			
4.50-6.10	93 93 79 / NI 400 590			
6.70-7.09 6.10-7.60	100 100 100	CS 2		
7.60-9.10	91 84 84			
9.10-10.70	100 98 95			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Clay bound LIMESTONE**	(0.90)		
Strong grey fine grained fossiliferous LIMESTONE with occasional calcite veins. WEATHERING: Possible solution features on fracture surfaces. DISCONTINUITIES: 0° - 20° very closely to medium spaced, predominantly closely spaced to 1.70m, then predominantly medium spaced smooth planar to undulating fractures.	0.90 +15.13		
0.90-1.22 m 90° rough planar fracture producing partially non-intact core 1.22-1.64 m Non-intact, recovered as coarse gravel. Assessed zone of core loss 1.64-1.70 m 40° smooth undulating fracture 2.83-2.85 m 30° smooth undulating to stepped fracture 3.61-3.72 m 70° smooth undulating fracture 3.78-4.63 m 80° smooth planar fracture with occasional calcite on fracture surfaces. 5.69-5.73 m Non-intact 8.55-8.62 m 55° -60° smooth planar fracture 8.68-8.80 m Partially non-intact core 9.15-9.21 m Non-intact	(9.80)		
Stratum continued next sheet			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBIII (296), 11/02/2004 11:33:10

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC124

Sheet 1 of 2

Borehole Log

Drilled by TB	Start 09/10/2003	Equipment, Methods and Remarks	Depth from to Diameter Casing Depth	Ground Level +16.03 mOD
Logged by JL	End 09/10/2003		0.00m 0.90m 131mm	Coordinates E 128748.72
Checked by ROR			0.90m 10.70m 86mm	National Grid N 228019.54

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				09/10/2003 0.90	1800 dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Strong grey fine grained fossiliferous LIMESTONE with occasional calcite veins. WEATHERING: Possible solution features on fracture surfaces. DISCONTINUITIES: 0° - 20° very closely to medium spaced, predominantly closely spaced to 1.70m, then predominantly medium spaced smooth planar to undulating fractures. EXPLORATORY HOLE ENDS AT 10.70 m	10.70 +5.33		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEGG HBIII (296), 11/02/2004 11:33:34

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole **RC124**

Sheet 2 of 2

Borehole Log

Drilled by TB Logged by JL Checked by ROR	Start 08/10/2003 End 08/10/2003	Equipment, Methods and Remarks Soil Mech Rotary Open Hole 131 diameter 0.00m to 1.00m. Rotary Core 68mm diameter 1.00m to 6.20m.	Depth from to Diameter Casing Depth 0.00m 1.00m 131mm 1.00m 6.20m 68mm	Ground Level +9.89 mOD Coordinates E 128883.40 National Grid N 227998.86

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			08/10/2003	0800
0.00-1.00	Rotary Open Hole Drilling			
1.00-1.40	40 0 0			
1.40-2.60	85 52 36			
2.60-3.00	90 73 38			
3.10	100	CS 1		
3.00-3.40	85 75			
3.40-3.84		CS 2		
3.40-4.00	100 73 58	NI 170 440		
3.90		CS 3		
4.00-4.80	75 55 44			
4.70		CS 4		
4.80-5.55	81 71 37			
5.55-6.20	92 92 92			
			08/10/2003 1.00	1800

Strata

Description	Depth, Level (Thickness)
Weathered clay bound LIMESTONE**	(1.00)
	1.00 +8.89
Strong grey fine grained LIMESTONE WEATHERING: Occasional slight solution features on fracture surfaces. DISCONTINUITIES: 30° and 60° very closely to medium spaced predominantly closely to medium spaced smooth undulating fractures with frequent brown clay smearing on fracture surfaces. 1.00-1.40 m Non-intact. Recovered as angular coarse gravel 1.52-1.83 m Non-intact, assumed zone of core loss 1.83-1.90 m Subvertical to 85 degree smooth planar fracture 1.90-2.20 m Non-intact 2.66-2.72 m Non-intact. Assessed zone of core loss 2.90-3.00 m 75° smooth planar fracture 3.17-3.19 m Non-intact 3.30-3.33 m Non-intact 3.63-3.83 m 80° smooth planar fracture with calcite on fracture surface 4.03-4.30 m Subvertical smooth planar fracture with calcite on surface 4.30-4.64 m Non-intact, assessed zone of core loss 4.64-5.38 m Subvertical to 80° smooth planar fracture with slight calcite mineralisation on surface 5.00-6.20 m 65° smooth planar fracture with calcite on surface	(5.20)
EXPLORATORY HOLE ENDS AT 6.20 m	6.20 +3.69

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (298): 11/02/2004 11:34:11

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC126

Sheet 1 of 1

Borehole Log

Drilled by TB Logged by SL Checked by ROR	Start 21/10/2003 End 21/10/2003	Equipment, Methods and Remarks Open hole 131mm diameter from 0.0m to 2.50m. Rotary Cored 75mm diameter from 2.50m to 6.0m.	Depth from to Diameter Casing Depth 0.00m 2.50m 131mm 2.50m 6.00m 75mm	Ground Level +6.66 mOD Coordinates E 129014.93 National Grid N 228032.34

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
		If //	21/10/2003	0800
0.00-2.50	Rotary Open Hole Drilling			
2.50-4.00	30 0 0			
3.70		CS 1		
4.00-4.50	60 0 0			
4.50-6.00	30 0 0			
			21/10/2003	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Boulder CLAY**	(2.50)		
Broken LIMESTONE or BOULDERS** Recovered as angular GRAVEL of limestone with light brown smears less than 2mm on surfaces.	2.50 +4.16		1, 2, SP
4.25-4.48 m Possible BOULDER of limestone	(3.50)		
EXPLORATORY HOLE ENDS AT 6.00 m	6.00 +0.66		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.50	-	-
2	3.20	-	-

Depth Related Remarks

From	to (m)	
3.00	6.00	Borehole caved in.

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HSIII (295), 16/02/2004 10:00:43

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC127

Sheet 1 of 1

Borehole Log

Drilled by TB Logged by SL Checked by ROR	Start 18/10/2003 End 21/10/2003	Equipment, Methods and Remarks Open Hole 131mm diameter from 0.00m to 1.00m. Rotary Cored75mm diameter from 1.0m to 14.50m.	Depth from to Diameter Casing Depth 0.00m 1.00m 131mm 1.00m 14.50m 75mm	Ground Level +18.61 mOD Coordinates E 129164.75 National Grid N 228076.23

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.00	Rotary Open Hole Drilling		18/10/2003	0800
1.00-2.00	80 N/A N/A			
2.00-3.50	87 47 9	NI 50 170		
3.50-4.80	92 85 46			
4.80-6.30	100 75 39			
6.30-7.90	38 37 34	5 150 340		
7.90-8.30	100 83 0		18/10/2003	1800
8.30-9.90	94 78 56		19/10/2003 19/10/2003 20/10/2003	0800 1800 0800

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
OVERBURDEN**	(0.70)		
Broken LIMESTONE** Non Intact: Recovered as coarse angular limestone GRAVEL with occasional slight brown clay smears less than 1mm thick on surfaces.	0.70 *+17.91*		
	(1.30)		
Strong grey fine grained LIMESTONE.	2.00 *+16.61*		
WEATHERING: Slight light brown discolouration on fracture surfaces with occasional light brown clay smear less than 1mm thick.			
DISCONTINUITIES: 1.00-3.50m: Subhorizontal to 10° very closely to closely predominately very closely spaced planar to undulating smooth to rough fractures. 3.50-10.80m: Subhorizontal to 10° very closely to medium predominately closely spaced planar to undulating smooth to rough fractures.	(12.50)		
2.25-2.45 m Subvertical planar smooth fracture with light brown clay smear less than 1mm on surfaces.			
2.75-2.83 m 60-70° planar to slightly undulating smooth fracture			
3.95 m Subhorizontal to 25° undulating smooth fracture			
4.65 m 45-50° planar smooth fracture with less than 1mm light brown clay smear on fracture surfaces			
6.00-6.20 m 45-50° planar smooth fracture producing some non intact core			
8.60 m 55-60° planar smooth fracture			
8.80-8.93 m Subvertical to 70° planar rough fracture			
9.20-10.80 m LIMESTONE becomes dark grey.			
Stratum continued next sheet			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBIII (298). 11/02/2004 11:17:21

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC129

Sheet 1 of 2

Borehole Log

Drilled by TB Logged by SL Checked by ROR	Start 18/10/2003 End 21/10/2003	Equipment, Methods and Remarks	Depth from to Diameter Casing Depth 0.00m 1.00m 131mm 1.00m 14.50m 75mm	Ground Level +18.61 mOD Coordinates E 129164.75 National Grid N 228076.23

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.90-10.80	98 88 88				
10.80-11.30	0 0 0				
11.30-12.10	0 0 0				
				20/10/2003	1800
				21/10/2003	0800
				21/10/2003	1800

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Strong grey fine grained LIMESTONE. WEATHERING: Slight light brown discolouration on fracture surfaces with occasional light brown clay smear less than 1mm thick. DISCONTINUITIES: 1.00-3.50m: Subhorizontal to 10° very closely to closely predominately very closely spaced planar to undulating smooth to rough fractures. 3.50-10.80m: Subhorizontal to 10° very closely to medium predominately closely spaced planar to undulating smooth to rough fractures.			SP
EXPLORATORY HOLE ENDS AT 14.50 m	14.50 *+4.11*		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG HBIII (286), 11/02/2004 11:17:48

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Borehole

RC129

Sheet 2 of 2

Borehole Log

Drilled by TB Logged by SL Checked by ROR	Start 17/10/2004 End 17/10/2004	Equipment, Methods and Remarks Open hole 131mm diameter from 0.0m to 1.0m, Rotary Cored 75mm diameter from 1.0m to 5.25m.	Depth from / to / Diameter / Casing Depth 0.00m / 1.00m / 131mm 1.00m / 5.25m / 75mm	Ground Level +10.86 mOD Coordinates E 129384.30 National Grid N 228142.61

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.00	Rotary Open Hole Drilling		17/10/2003	0800
1.00-1.50	30 0 0	15 80 160		
1.50-2.15	77 31 0			
2.15-2.65	88 46 0			
2.65-3.60	68 48 34			
3.60-5.25	83 56 36	9 150 450	17/10/2003 1.00	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
OVERBURDEN**	(0.60)		
Strong grey fine grained fossiliferous LIMESTONE.	0.60 +10.26		
WEATHERING: Slight light brown discolouration on fracture surface.			
DISCONTINUITIES: 1.00m to 3.80m: Subhorizontal to 10° very closely to closely predominately closely spaced planar smooth fracture. 3.80-5.25m: Subhorizontal very closely to medium predominately closely spaced planar smooth fracture.	(4.65)		
EXPLORATORY HOLE ENDS AT 5.25 m	5.25 +5.61		

1.00-1.40 m Assessed zone of core loss

1.40-1.50 m Undulating rough fracture with brown discolouration on surface

1.52 m 45-55° undulating rough fracture

2.15 m 55 to 65° undulating rough fracture

3.20-3.28 m 60 to 70° planar smooth fracture

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MEGG GBIII (288), 11/02/2004 11:28:30

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC132

Sheet 1 of 1

Borehole Log

Drilled by TB Logged by SL Checked by ROR	Start 14/10/2003 End 17/10/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level +11.66 mOD Coordinates E 129358.85 National Grid N 228156.25
		Open hole 131mm diameter from 0.0m to 1.00m. Rotary Cored 75mm diameter from 1.00m to 10.40m.	0.00m 1.00m	1.00m 10.40m	131mm 75mm		

Samples and Tests / Strata

Depth	Type & No (TCR / SCR / RQD)	If	Records	Date / Casing	Time / Water	Description	Depth, *Level* (Thickness)
				14/10/2003	0800	Boulders possible weathered LIMESTONE**	
0.00-1.00	Rotary Open Hole Drilling						(1.00)
1.00-1.70	21 / 0 / 0					BOULDER / weathered LIMESTONE** Non Intact: Recovered as coarse subrounded to angular limestone GRAVEL. Assessed zone of core loss.	1.00 *+10.66*
1.70-2.70	138 / 18 / 0			14/10/2003	1800		(1.70)
				16/10/2003	0800		2.70 *+8.96*
2.70-3.60	61 / 47 / 28					Strong to moderate strong grey finegrained LIMESTONE. WEATHERING: Fresh to slight light brown discolouration on fracture surfaces. DISCONTINUITIES: 0.0m to 6.80m: Subhorizontal very closely to closely predominately closely spaced planar smooth fractures. 6.80m to 10.40m: Subhorizontal very closely to medium spaced predominately medium spaced planar smooth fractures.	
3.60-4.45	66 / 29 / 0	NI / 110 / 200				3.60-3.80 m Subvertical to 75° planar smooth fracture 3.80-3.90 m Non Intact assessed zone of core loss recovered as coarse angular gravel	
4.45-4.60			TCR 100, SCR 0, RQD 0			4.45-4.60 m Non Intact: Recovered as coarse angular gravel.	
4.60-6.10	29 / 0 / 0					4.60-8.00 m Core narrows to a min of 42mm diameter due to core slip.	
6.10-6.80	93 / 0 / 0						(7.70)
6.80-8.00	82 / 0 / 0			16/10/2003	1800	6.85 m 45° planar smooth fracture	
				17/10/2003	0800		
8.00-9.10	98 / 86 / 0	30 / 260 / 520				8.00 m 45° planar smooth fracture 8.09-8.25 m Subvertical undulating rough fracture 8.85 m 45° planar smooth fracture 8.95 m 45° smooth fracture	
9.10-9.55	87 / 0 / 0					9.35 m 60° planar smooth fracture	
9.55-10.40	79 / 29 / 13						

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Stratum continued next sheet

Depth, *Level* (Thickness)	Legend	Backfill/ Instruments

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (298), 25/01/2004 14:18:54 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC133

Borehole Log

Drilled by	TB
Logged by	SL
Checked by	ROR

Start 14/10/2003
End 17/10/2003

Equipment, Methods and Remarks

Depth from	to	Diameter	Casing Depth
0.00m	1.00m	131mm	
1.00m	10.40m	75mm	

Ground Level	+11.66 mOD
Coordinates	E 129358.85
National Grid	N 228156.25

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				17/10/2004	1800

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
Strong to moderate strong grey finegrained LIMESTONE. WEATHERING: Fresh to slight light brown discolouration on fracture surfaces. DISCONTINUITIES: 0.0m to 6.80m: Subhorizontal very closely to closely predominately closely spaced planar smooth fractures. 6.80m to 10.40m: Subhorizontal very closely to medium spaced predominately medium spaced planar smooth fractures. EXPLORATORY HOLE ENDS AT 10.40 m	10.40 +1.26		SP

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From to (m)

Chiselling

Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (288), 23/01/2004 14:18:56

AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole

RC133

Sheet 2 of 2

Borehole Log

Drilled by	TB
Logged by	JL
Checked by	ROR

Start	11/10/2003
End	12/10/2003

Equipment, Methods and Remarks
Soil Mech
Rotary Open Hole 131mm diameter 0.00m to 1.00m. Rotary Core 68mm diameter 1.00m to 10.00m. Borehole examined by televiewer.

Depth from	to	Diameter	Casing Depth
0.00m	1.00m	131mm	
1.00m	10.00m	68mm	

Ground Level	+16.65 mOD
Coordinates	E 129407.30
National Grid	N 228290.20

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			11/10/2003	0800
0.00-1.00	Rotary Open Hole Drilling			
1.00-1.40	23 0 0			
1.40-2.30	100 39 11			
2.35		CS 1		
2.30-3.05	100 75 31	NI 80 140		
3.05-3.40	100 100 43			
3.40-4.70 4.15-4.65	95 91 77	CS 2		
4.70-5.85	100 82 82			
5.85-6.80	75 73 73			
6.50		CS 3	11/10/2003 1.00	1800
6.72		CS 4	12/10/2003 1.00	0800
6.80-8.40	91 91 91	NI 280 490		
8.40-10.00	68 43 43	Core Slipped		
			12/10/2003 1.00	1800

Strata

Description		Depth, Level (Thickness)
OVERBURDEN**		(0.50)
Possible LIMESTONE / COBBLES**		0.50 +16.15
		(0.50)
Possibly fractured LIMESTONE** Recovered as coarse gravel and cobbles (poor recovery)	1.00-1.82 m Non-intact. Assumed zone of core loss	1.00 +15.65
		(0.40)
Strong grey brown fine grained LIMESTONE with occasional heavily crenulated stylolites and rare calcite veins.		1.40 +15.25
WEATHERING: Dissolution features are common with fracture surfaces displaying chalky residue, often accompanied by orange brown discolouration. Calcite veins stained yellow	1.90-1.98 m Non-intact 2.27-2.34 m Non-intact	
DISCONTINUITIES: 0° -15° very closely to medium spaced, predominantly closely spaced to 4.15m then medium spaced, smooth planar to undulating fractures. 35° - 50° medium to widely spaced smooth undulating fractures, commonly found with chalky white residue on surface.	2.72-2.94 m Non-intact 3.40-3.47 m Non-intact 4.50-4.63 m 75 degree smooth undulating fracture 4.63-4.82 m Non-intact. Assumed zone of core loss 5.35-5.46 m Non-intact 5.70-5.76 m 60-70 degree smooth undulating fracture with white chalky residue and orange brown clay smear on fracture surface 6.44-6.70 m Non-intact. Assumed zone of core loss 8.92-8.98 m Non-intact 8.98-9.10 m Subvertical smooth undulating fracture 9.18-9.36 m Non-intact	(8.60)
EXPLORATORY HOLE ENDS AT 10.00 m		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Legend: Backfill/Instruments

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) ME3G HBIII (296), 11/02/2004 11:34:47

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole
RC135
Sheet 1 of 1

Borehole Log

Drilled by TB Logged by JL Checked by ROR	Start 10/10/2003 End 11/10/2003	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level Coordinates National Grid	+13.10 mOD E 129503.30 N 228274.50
		Soil Mech Rotary Open Hole 131mm diameter 0.00m to 1.00m, Rotary Core 68mm diameter 1.00m to 10.00m.	0.00m 1.00m	1.00m 10.00m	131mm 68mm			

Samples and Tests

Depth	Type & No (TCR / SCR / RQD)	Records	Date Casing	Time Water
			10/10/2003	0800
0.00-1.00	Rotary Open Hole Drilling			
1.00-1.70	100 / 54 / 23			
1.70-2.70	52 / 28 / 28			
2.50		CS 1		
3.00		CS 2		
2.70-4.20	100 / 100 / 84			
3.70-3.92		CS 3		
		TCR 63, SCR 0, RQD 0		
4.20-4.50				
4.50-6.00	100 / 73 / 64			
6.00-6.40	95 / 95 / 70			
6.40-7.40	80 / 80 / 80			
7.40-8.40	100 / 100 / 100			
			10/10/2003 1.00	1800 dry
			11/10/2003 1.00	0800
8.40-10.00	100 / 100 / 100			
			11/10/2003 1.00	1800

Strata

Description		Depth, Level (Thickness)
OVERBURDEN**		(0.50) 0.50 +12.60
Weathered LIMESTONE**		(0.50) 1.00 +12.10
Strong light grey fine grained to crystalline LIMESTONE with occasional becoming frequent crenulated stylolites. WEATHERING: Dissolution features are common with fracture surfaces displaying chalky residue and occasional brown clay smearing DISCONTINUITIES: 1.0m -6.0m: 0° -10° very closely to medium spaced, predominantly closely spaced smooth undulating fractures. 6.0m - 10.0m: 0° -10° medium to widely spaced predominantly medium spaced smooth undulating fractures.	1.00-1.21 m Non-intact 1.52-2.43 m Non-intact. Assessed zone of core loss. 1.80-2.10 m Driller noted soft band 2.62-2.70 m 80° - 75° smooth planar fracture with dissolution features on surface 4.16-4.20 m 40° smooth undulating fractures 4.20-4.50 m Non-intact, assessed zone of core loss 4.81-4.85 m 50° smooth planar fracture 4.85-5.00 m 60°-70° smooth undulating fracture 5.07-5.10 m 30° smooth planar fracture 5.22-5.27 m Non-intact 5.33-5.38 m 45° smooth undulating fracture with some non-intact material 5.45-5.50 m 50° smooth planar fracture with solution features on fracture surfaces 5.50-5.71 m Non-intact 5.71-5.86 m 80° smooth undulating fractures, possibly drilling induced, producing partially non-intact core 6.40-7.50 m Driller noted slipped core	(9.00)

EXPLORATORY HOLE ENDS AT 10.00 m

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

(c) MESG HBII (298), 05/02/2004 13:15:46 AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Borehole **RC138**

Sheet 1 of 1

Borehole Log

Drilled by TB Logged by JL Checked by ROR	Start 12/10/2003 End 14/10/2003	Equipment, Methods and Remarks Soil Mech Rotary Open Hole 131mm diameter 0.00m to 0.70m. Rotary Core 68mm diameter 0.20m - 10.00m. Borehole collapsed - not examined using televiewer.	Depth from / to / Diameter / Casing Depth 0.00m / 0.70m / 131mm 0.70m / 10.00m / 68mm	Ground Level +11.58 mOD Coordinates E 129502.60 National Grid N 228240.80	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.70	Rotary Open Hole Drilling		12/10/2003	0800
0.70-1.90	73 53 22			
2.15-2.35 1.90-2.60	90 67 59	CS 1		
2.60-3.20	103 83 83	NI 110 210		
3.20-3.90 3.60	89 71 71	CS 2		
3.90-4.45	100 75 56		12/10/2003	1800
4.40		CS 3	0.70	
4.45-4.75		TCR 87, SCR 13, RQD 0	13/10/2003	0800
4.75-5.00		TCR 100, SCR 88, RQD 68	0.70	
5.00-6.50	100 100 85		13/10/2003	1800
			1.00	
			14/10/2003	0800
			1.00	
6.50-8.10	100 100 100	60 260 880		
8.10-9.70	94 94 89			
			14/10/2003	1800
			1.00	

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description		Depth, Level (Thickness)	Legend	Backfill/ Instruments
OVERBURDEN**		0.20 +11.38		
LIMESTONE**		(0.50)		
Strong light grey brown fine grained to crystalline LIMESTONE. WEATHERING: Dissolution features are common, with fracture surfaces displaying chalky residue, often accompanied by yellow brown discolouration. DISCONTINUITIES: 0 - 10 degree closely to medium spaced, predominantly closely spaced smooth planar to undulating fractures. Between 0.70m - 5.50m: 60 - 75 degree medium spaced smooth planar to undulating fractures,often with yellwo brown staining on surface.	0.70-0.77 m Non-intact, assumed zone of core loss 0.77-0.91 m Subvertical smooth undulating fracture 1.08-1.30 m Non-intact, recovered as angular coarse gravel. Assumed zone of core loss. 1.36-1.44 m Non-intact 1.54-1.59 m Non-intact 1.73-1.90 m Assumed zone of core loss 1.93-2.03 m Subvertical smooth planar fracture 2.03-2.20 m Non-intact, assumed zone of core loss 2.60-2.66 m Assumed zone of core loss 3.34-3.50 m Non-intact, assumed zone of core loss 3.64-3.65 m Non-intact 3.98-4.10 m Non-intact 4.10-4.50 m Subvertical to 85 degree rough undulating fracture with solution features on surfaces 4.56-4.77 m Non-intact 4.79-5.20 m Subvertical to 85 degree smooth undulating fracture withchalky white residue on surface 5.30-5.32 m 35 degree smooth planar fracture 5.66-5.67 m Non-intact 9.16-9.23 m Subvertical smooth undulating fracture 9.23-9.33 m Assumed zone of core loss	0.70 +10.88		
		(9.30)		
EXPLORATORY HOLE ENDS AT 10.00 m				

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MEGG HBIII (298), 11/02/2004 11:35:27

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Borehole
RC140
Sheet 1 of 1

Trial Pit Log

Logged by DJB	Start -	Equipment, Methods and Remarks	Dimensions and Orientation	Ground Level +6.27 mOD
Checked by ROR	End -	Excavated using a track machine.	Width 2.00 m Length 2.50 m 75 (Deg)	Coordinates E 127503.10 National Grid N 228405.00

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 TOPSOIL			
			2 Plastic dark brown clayey pseudo fibrous PEAT.	0.10 +6.17		
0.40-0.60	B 2					
0.40-0.60	B 3					
0.50	D 1					
				(1.35)		
1.00	D 4					
1.00	B 5					
1.00-1.30	B 6					
1.40-1.60	B 8					1
1.40-1.60	B 9			1.45 +4.82		
1.50	D 7		3 Soft light grey slightly sandy gravelly CLAY with abundant shell fragments, mainly laminated with soft grey silt.			
				1.65 +4.62		
			4 Soft grey gravelly CLAY . Gravel is subangular to subrounded, fine to coarse of limestone.	1.70 +4.57		
			EXPLORATORY HOLE ENDS AT 1.70 m			
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.45	Slight inflow.

Depth Related Remarks

From	to (m)	
1.70		Trial pit terminated due to obstruction - boulders or rock.

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 27/01/2004 09:45:57

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP34

Sheet 1 of 1

Trial Pit Log

Logged by CH Checked by ROR	Start 20/11/2003 End 20/11/2003	Equipment, Methods and Remarks Excavated using track machine	Dimensions and Orientation Width 1.00 m Length 3.50 m 160 (Deg)	Ground Level +6.39 mOD Coordinates E 127577.99 National Grid N 228331.56

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instrument
			1 Dark brown to black pseudo fibrous plastic PEAT with abundant wood fragments (80mm x 100mm x 200mm) and some reed debris.			
1.00	B 1					
1.00	D 2			(2.40)		
			2 Uncompact soft creamy dark brown organic slightly sandy slightly gravelly SILT with abundant shells and reed debris.	2.40 +3.99		
2.60	HV	p 35 kPa, r 12 kPa				
2.60	HV	p 6 kPa, r 2 kPa				
2.60	D 3		3 Very soft creamy brown slightly organic SILT/CLAY with abundant shells	2.60 +3.79		
2.80	D 4					
2.80	B 5		EXPLORATORY HOLE ENDS AT 2.80 m	2.80 +3.59		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike (m)	Behaviour
1	1.10		Inflow from side A
1	2.30		Strong Inflow

Depth Related Remarks

From	to (m)	
2.80		Trial pit terminated due to walls collapsing.

Stability Very poor

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column

Scale 1:25

(c) MEGG HBIII (288) 26/01/2004 17:55:28

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP40

Sheet 1 of 1

Trial Pit Log

Logged by	Start	Equipment, Methods and Remarks	Dimensions and Orientation	Ground Level	+7.11 mOD
CH	20/11/2003	Excavated using a track machine.	Width 1.00 m	Coordinates	E 127704.33
Checked by ROR	End 20/11/2003		Length 3.00 m	National Grid	N 228287.76

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 TOPSOIL	0.10 +7.01		
			2 Grey slightly clayey sandy GRAVEL with some cobbles. Cobbles are subangular of limestone	(0.45)		
0.40	D 2		0.50 m Boulders of limestone 200 x 300 x 300mm	0.55 +6.56		
0.40	B 3		3 Firm yellow/brown very sandy slightly gravelly CLAY with occasional cobbles. Cobbles are subangular to subrounded of limestone.			
0.80	D 4			(0.70)		
0.80	B 5					
1.00	HV	p 42 kPa	1.00 m Boulders of limestone 900mm x 1000mm x 1200mm	1.25 +5.86		
			EXPLORATORY HOLE ENDS AT 1.25 m			

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike	Behaviour
1	1.00		Slight inflow into base

Depth Related Remarks

From	to (m)	
1.25		Trial pit terminated on obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBII (298), 10/02/2004 13:17:30

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP47

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.85 m Length 4.00 m 132 (Deg)	Ground Level +6.98 mOD Coordinates E 127805.85 National Grid N 228242.44

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 TOPSOIL: Firm brown slightly sandy slightly gravelly CLAY with many roots. Gravel is subangular to 2 rounded.	0.15 +6.83		
0.50-1.00 0.50-1.00	B 2 B 3		Stiff grey slightly sandy slightly gravelly CLAY with many cobbles and boulders. Gravel is subrounded fine to coarse. Cobbles and boulders are subrounded of limestone. Boulders are up to 400mm.	(2.35)		
1.50 1.50-2.00 1.50-2.00	D 4 B 5 B 7		0.70 m Clay becoming soft			
			EXPLORATORY HOLE ENDS AT 2.50 m	2.50 +4.48		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.30	Rose to 2.00 m after 20 minutes.

Depth Related Remarks

From	to (m)	
2.50		Trial pit terminated due to obstruction - presumed bedrock.

Stability Poor below 0.70m.

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HSIII (298), 16/02/2004 11:43:06

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP56

Sheet 1 of 1

Trial Pit Log

Logged by CH Checked by ROR	Start 20/11/2003 End 20/11/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.00 m Length 3.00 m	Ground Level +6.52 mOD Coordinates E 127909.92 National Grid N 228224.87

Samples and Tests

Depth	Type & No.	Date Records
0.80	W 3	
1.00	D 1	
1.00	B 2	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 Dark brown to black fibrous non plastic locally plastic PEAT with some wood and plant debris. Locally slightly sandy organic clay.	(2.20)		
1.00 m Slightly sandy organic CLAY. Strong sulphate odour			
1.20 m Boulders of granite			
2.00 m Boulders of limestone			
2 Light grey silty sandy GRAVEL with cobbles of limestone.	2.20 +4.32		
EXPLORATORY HOLE ENDS AT 2.30 m	2.30 +4.22		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.40	Rose to 1.30 m after 10 minutes.
2	2.00	Rose to 1.70 m after 5 minutes.

Depth Related Remarks

From	to (m)	
2.30		Trial pit terminated due to flooding. Water rose to 0.80m in an hour.

Stability Poor

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (298), 26/01/2004 17:55:45

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP62

Sheet 1 of 1

Trial Pit Log

Logged by DMF Checked by ROR	Start 07/10/2003 End 07/10/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 2.20 m Length 3.50 m	Ground Level +6.50 mOD Coordinates E 128296.70 National Grid N 228116.60

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.50	D 2	
0.50	B 3	
0.50	B 4	
1.50	D 5	
1.50	B 6	
1.50	B 7	
2.50	B 10	
2.50	D 8	
2.50	B 9	
3.40	D 11	
3.40	B 12	
3.40	B 13	
3.40	W 14	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 Spongy dark brown black fibrous PEAT with abundant decaying organic matter.			
0.50 m Becoming orange brown			
1.50 m Becoming dark brown, orgaincs moderately to partially decomposed	(3.10)		
2.30 m Organics less decomposed from 2.30m			
2.60 m Becoming mottled yellow			
2 Uncompact grey highly organic fibrous slightly sandy slightly gravelly SILT with abundant shells and shell fragments.	3.10 +3.40 (0.40)		
EXPLORATORY HOLE ENDS AT 3.50 m	3.50 +3.00		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	0.80	Slight seepage
2	1.90	Slight seepage
3	2.60	Slight seepage
4	3.50	Rose to 2.75 m after 60 minutes.

Depth Related Remarks

From	to (m)	
3.50		Trial pit terminated on clients instructions

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBII (298), 10/02/2004 13:17:56

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP104

Sheet 1 of 1

Trial Pit Log

Logged by DMF Checked by ROR	Start 07/10/2003 End 07/10/2003	Equipment, Methods and Remarks Excavated using a track machine.	Dimensions and Orientation Width 2.20 m Length 3.20 m	Ground Level +7.02 mOD Coordinates E 128392.80 National Grid N 228090.20

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.50	D 2	
0.50	B 3	
0.50	B 4	
1.40	D 5	
1.40	B 6	
1.40	B 7	
2.30	B 10	
2.30	D 8	
2.30	B 9	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse.	0.25 +6.77		
2 Firm yellow brown mottled grey sandy gravelly CLAY with many cobbles and some boulders. Gravel is angular to subangular fine to coarse. CObbles and boulders are angular to subrounded of limestone, boulders up to 2200mm in length. 0.50 m Hand vane attempted 16 times - to gravelly	(0.95)		
3 Soft grey sightly sandy gravelly CLAY with some cobbles and boulders. Gravel is angular to subangular fine to coarse. Cobbles are subangular to subrounded of limestone, boulders are angular of limestone, up to 1100mm in length.	1.20 +5.82		
	(1.20)		1
EXPLORATORY HOLE ENDS AT 2.40 m	2.40 +4.62		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.10	Rose to 1.85 m after 45 minutes. Slight seepage

Depth Related Remarks

From	to (m)	
2.40		Trial pit terminated due to boulders

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MEGG Hill (298), 10/02/2004 13:16:26

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP113

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start - End -	Equipment, Methods and Remarks Excavated using a JCB.	Dimensions and Orientation Width 2.20 m Length 2.20 m 270 (Deg)	Ground Level +13.20 mOD Coordinates E 128505.78 National Grid N 228038.65

Samples and Tests

Depth	Type & No.	Date Records
0.30	D 1	
1.00	D 2	
1.00-1.30	B 3	
1.00-1.30	B 4	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy, slightly gravelly, fibrous CLAY with many cobbles and boulders. Gravel is subrounded to subangular, fine to coarse. Cobbles and boulders are subrounded of limestone, boulders up to 1100mm in length.	(0.35)		
2 Brown clayey very sandy GRAVEL with many cobbles and boulders. Gravel is subangular to subrounded, fine to coarse. Cobbles and boulders are subangular to subrounded, boulders are up to 90mm in length.	0.35 *+12.85* (1.05)		
EXPLORATORY HOLE ENDS AT 1.40 m	1.40 *+11.80*		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post (m)	Strike Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
1.40		Trial pit terminated, due to side walls collapsing and boulder at the base of pit.

Stability Poor

Shoring None.

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MEGG HBIII (298), 27/01/2004 09:54:45

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP121

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start - End -	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.90 m Length 2.75 m 280 (Deg)	Ground Level +16.46 mOD Coordinates E 128625.40 National Grid N 228033.20

Samples and Tests

Depth	Type & No.	Date Records
0.30	D 1	
1.00	D 2	
1.00-1.30	B 3	
1.00-1.30	B 4	
1.50	D 5	
1.50-1.80	B 6	
1.50-1.80	B 7	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy, slightly gravelly fibrous CLAY. Gravel is subangular to subrounded, fine to coarse.	(0.40)		
2 Brown clayey very gravelly SAND with many cobbles and boulders. Gravel is subangular to subrounded occasional elongate. Cobbles and boulders are subangular of limestone. Boulders up to 700mm in length. 0.40-1.00 m Occasional Roots. 1.50 m Becoming grey with occasional boulders.	0.40 +16.06 (1.40)		
EXPLORATORY HOLE ENDS AT 1.80 m	1.80 +14.66		

Depth	Type & No.	Records Date

Groundwater Entries

No. Struck	Post Strike (m)	Behaviour
None observed (see Key Sheet)		

Depth Related Remarks

From	to (m)	
1.80		Trial pit terminated due to obstruction, possible limestone bedrock or boulder.

Stability Moderate

Shoring None.

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (298), 27/01/2004 08:42:11

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP123

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start - End -	Equipment, Methods and Remarks Excavated using a JCB.	Dimensions and Orientation Width 0.80 m Length 3.00 m 140 (Deg)	Ground Level +13.83 mOD Coordinates E 128791.40 National Grid N 228017.00

Samples and Tests

Depth	Type & No.	Date Records
0.20	D 1	
0.40	D 2	
0.40-0.60	B 3	
0.40-0.60	B 4	
1.50	D 5	
1.50-1.70	B 6	
1.50-1.70	B 7	
2.30-2.50	B 10	
2.30-2.50	B 9	
2.50	D 8	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded, fine to coarse.			
2 Firm brown slightly sandy gravelly CLAY with occasional cobbles and occasional rocks. Gravel is subangular to subrounded, fine to coarse	0.20 +13.63 (0.40)		
3 Grey slightly clayey SAND and GRAVEL with occasional cobbles. Gravel is subangular, fine to coarse. Cobbles are subangular of limestone. 0.60-0.90 m Occasional pockets of firm grey slightly sandy clay. 1.90 m With occasional subrounded boulders of limestone (up to 800mm in length)	0.60 +13.23 (1.90)		
EXPLORATORY HOLE ENDS AT 2.50 m	2.50 +11.33		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post	Strike Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
1.90		Trial pit terminated due to obstruction, possible bedrock or boulder.

Stability Good.

Shoring None.

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 27/01/2004 09:42:19

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Trial Pit

TP125

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 15/10/2003 End 15/10/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.80 m Length 2.50 m 110 (Deg)	Ground Level +7.22 mOD Coordinates E 129009.49 National Grid N 228047.30

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.50	D 2	
0.50-0.80	B 3	
0.50-0.80	B 4	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 MADE GROUND: Firm brown slightly sandy slightly gravelly fibrous CLAY with rare brick fragments. 2 Gravel is subangular to rounded fine to coarse.	0.10 +7.12		
Very stiff grey slightly sandy slightly gravelly CLAY with many cobbles. Gravel is subangular to angular fine to coarse. Cobbles are subangular of limestone.	(0.70)		
EXPLORATORY HOLE ENDS AT 0.80 m	0.80 +6.42		

Depth	Type & No.	Records Date

Groundwater Entries

No. Struck	Post Strike	Behaviour (m)
None observed (see Key Sheet)		

Depth Related Remarks

From	to (m)	
0.80		Trail pit terminated due to obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (299), 16/02/2004 11:47:42

AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Trial Pit

TP127A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.90 m Length 3.20 m 272 (Deg)	Ground Level +8.28 mOD Coordinates E 129058.83 National Grid N 227961.17

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 TOPSOIL: Brown slightly gravelly CLAY with many roots. Gravel is subangular to subrounded fine to coarse.	0.10 +8.18		
0.50	D 2		2 Stiff brown slightly sandy gravelly CLAY with many cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Cobbles and boulders are subangular to subrounded of limestone. Boulders are up to 1100mm in length.	(1.10)		
0.50-1.00	B 3					
0.50-1.00	B 4					
			3 Weathered LIMESTONE: Recovered as grey GRAVEL with many cobbles. Gravel is angular to subangular fine to coarse. Cobbles are angular to subangular of limestone.	1.20 +7.08		
				(0.30)		
			EXPLORATORY HOLE ENDS AT 1.50 m	1.50 +6.78		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike (m)	Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
1.50		Trial pit terminated due to obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MEBG HBII (298), 10/02/2004 10:18:52

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP127B

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 14/10/2003 End 14/10/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.85 m Length 2.50 m 135 (Deg)	Ground Level +20.00 mOD Coordinates E 129155.76 National Grid N 228074.72

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.20	D 2	
0.20-0.30	B 3	
0.20-0.30	B 4	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy gravelly slightly fibrous CLAY. Gravel is subrounded to subangular fine to coarse.	0.10 *+19.90*		
2 Stiff grey brown slightly sandy gravelly CLAY with many cobbles. Gravel is subangular to subrounded fine to coarse. Cobbles are subrounded of limestone.	0.35 *+19.65*		
EXPLORATORY HOLE ENDS AT 0.35 m			

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck	Post Strike (m)	Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
0.35		Trial pit terminated due to obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (398), 16/02/2004 11:47:47

AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP128

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 14/10/2003 End 14/10/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 1.00 m Length 3.50 m 230 (Deg)	Ground Level +15.97 mOD Coordinates E 129229.91 National Grid N 228105.04

Samples and Tests

Depth	Type & No.	Date Records

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 Strong grey fine to medium grained crystalline LIMESTONE. Weathering: Orange brown discolouration penetrating 2-3mm along fracture surfaces. Discontinuities: No orientation or openings are determinable, surfaces undulating and rough. Recovered as clayey slightly sandy GRAVEL with many cobbles and boulders. Gravel is angular to subangular fine to coarse. Cobbles and boulders are angular to subangular of limestone, boulders up to 500mm.	(0.50) 0.50 +15.47		
EXPLORATORY HOLE ENDS AT 0.50 m			

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike (m)	Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
0.50	-	Trial pit terminated due to obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see Key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MEBG HBM (298), 18/02/2004 13:59:04

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP131

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 14/10/2003 End 14/10/2003	Equipment, Methods and Remarks Excavated using JCB	Dimensions and Orientation Width 1.00 m Length 2.80 m 82 (Deg)	Ground Level +11.73 mOD Coordinates E 129358.80 National Grid N 228152.78

Samples and Tests / Strata

Depth	Type & No.	Date Records	Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
0.50 0.50-0.80 0.50-0.80	D 1 B 2 B 3		1 MADE GROUND: Grey clayey sandy GRAVEL with many cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Cobbles and boulders are subangular of limestone, boulders are up to 1000mm in length. (Backfill from quarry)	(0.80) 0.80 *+10.93*		
			EXPLORATORY HOLE ENDS AT 0.80 m			

Depth	Type & No.	Records Date

Groundwater Entries
No. Struck (m) Post Strike Behaviour
None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.80		Trial pit terminated due to obstruction - possible limestone bedrock or boulder.

Stability Good
Shoring None
Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 10/02/2004 12:18:18 AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Trial Pit
TP134
Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.90 m Length 4.00 m 278 (Deg)	Ground Level +9.60 mOD Coordinates E 129365.44 National Grid N 228197.29

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 TOPSOIL: Firm brown slightly sandy slightly gravelly CLAY with abundant roots. Gravel is subangular to subrounded fine to coarse.	0.20 +9.40		
0.50	D 2		2 Firm to stiff grey slightly sandy slightly gravelly CLAY with many cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Cobbles and boulders are subrounded of limestone. Boulders are up to 1000mm.	(1.20)		
0.50-1.00	B 3					
0.50-1.00	B 4					
			EXPLORATORY HOLE ENDS AT 1.40 m	1.40 +8.20		
Depth	Type & No.	Records Date				

Groundwater Entries	Depth Related Remarks	
No. Struck Post Strike Behaviour (m)	From to (m)	Stability Good
None observed (see Key Sheet)	1.40 Trial pit terminated due to obstruction - possible rockhead or boulder.	Shoring None
		Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough	Trial Pit
Scale 1:25 (c) MESG HBIII (298), 27/01/2004 09:42:46 AGS	Project No. KC3210	TP134A
	Carried out for Galway County Council	Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 14/10/2003 End 14/10/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.85 m Length 2.40 m A B C D 47 (Deg)	Ground Level +13.60 mOD Coordinates E 129449.65 National Grid N 228215.41

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 MADE GROUND: Soft to firm brown slightly sandy slightly gravelly slightly fibrous CLAY. Gravel is subangular to rounded fine to coarse.	0.10 +13.50		
0.50 0.50-0.90 0.50-0.90	D 2 B 3 B 4		2 MADE GROUND: Firm to stiff grey brown slightly sandy very gravelly CLAY with many cobbles and some boulders. Gravel is subangular fine to coarse. Cobbles and boulders are angular to subangular of limestone, boulders up to 750mm in length	(0.80)		
			EXPLORATORY HOLE ENDS AT 0.90 m	0.90 +12.70		

Depth	Type & No.	Records Date

Groundwater Entries	Depth Related Remarks	
No. Struck Post Strike Behaviour (m)	From to (m)	Stability Good
None observed (see Key Sheet)	0.90 Trial pit terminated due to boulders.	Shoring None
		Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough	Trial Pit
Scale 1:25 (c) MESG HBII (286), 10/02/2004 13:19:38 AGS	Project No. KC3210	TP136
	Carried out for Galway County Council	Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 07/11/2003 End 07/11/2003	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 1.00 m Length 3.10 m 272 (Deg)	Ground Level +12.90 mOD Coordinates E 129501.80 National Grid N 228256.50

Samples and Tests / Strata

Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10	D 1		1 TOPSOIL: Firm brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse.	0.10 +12.80		
0.20-0.50	B 3		2 Stiff grey brown slightly sandy gravelly SILT with many cobbles and boulders. Gravel is subangular to subrounded fine to coarse. Cobbles and boulder are subrounded of limestone, boulders up to 1100mm in length.	(0.60)		
0.20-0.50	B 4					
0.50	D 2			0.70 +12.20		
			EXPLORATORY HOLE ENDS AT 0.70 m			

Depth	Type & No.	Records Date

Groundwater Entries
No. Struck (m) Post Strike Behaviour
None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
0.70		Trial pit terminated due to obstruction - presumed bedrock.

Stability Good
Shoring None
Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG (HBII / 298), 10/02/2004 13:20:02 AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No. KC3210
Carried out for Galway County Council

Trial Pit **TP139**
Sheet 1 of 1

Trial Pit Log

Logged by DJB	Start 14/10/2003	Equipment, Methods and Remarks	Dimensions and Orientation	Ground Level +11.39 mOD
Checked by ROR	End 14/10/2003	Excavated using a JCB	Width 0.90 m Length 3.20 m A B D C 120 (Deg)	Coordinates E 129551.80 National Grid N 228222.90

Samples and Tests

Depth	Type & No.	Date Records
0.20	D 1	
1.00	D 2	
1.00-1.40	B 3	
1.00-1.40	B 4	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm brown slightly sandy slightly gravelly fibrous CLAY. Gravel is subangular to rounded fine to coarse.	0.20 +11.19		
2 Stiff grey occasional mottled brown slightly sandy very gravelly SILT with many cobbles and some boulders. Gravel is angular to subangular fine to coarse. Cobbles and boulders are subangular of limestone, boulders are up to 700mm.	(1.20)		
EXPLORATORY HOLE ENDS AT 1.40 m	1.40 +9.99		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck	Post Strike	Behaviour (m)
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
1.40		Trial pit terminated due to obstruction - possible limestone bedrock or boulders.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (298), 10/02/2004 13:20:25

AGS

Project N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough

Project No. KC3210

Carried out for Galway County Council

Trial Pit

TP142

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 18/10/2003 End 18/10/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.80 m Length 3.95 m 133 (Deg)	Ground Level +6.15 mOD Coordinates E 129622.80 National Grid N 228145.70

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.50 0.50-0.70 0.50-0.70	D 1 B 2 B 3		1 MADE GROUND: Firm brown slightly sandy gravelly slightly fibrous CLAY with many cobbles, fragments of brick, tile and abundant wood and rare glass. Gravel is subangular to subrounded fine to coarse. Strong organic and oily odour.	(0.75)		
1.00 1.00-1.50 1.00-1.50	D 4 B 5 B 6		2 Firm grey slightly sandy very gravelly SILT with many cobbles and boulders. Gravel is angular to subangular fine to coarse. Cobbles and boulders are subangular of limestone, boulder up to 1100mm in length.	0.75 +5.40 (1.25)		
			EXPLORATORY HOLE ENDS AT 2.00 m	2.00 +4.15		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	0.70	Fast flow

Depth Related Remarks

From	to (m)	
2.00		Trial pit terminated due to obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBII (298), 10/02/2004 13:20:49

AGS

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP146

Sheet 1 of 1

Trial Pit Log

Logged by DJB Checked by ROR	Start 18/10/2003 End 18/10/2003	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.90 m Length 2.75 m 120 (Deg)	Ground Level +5.91 mOD Coordinates E 129604.80 National Grid N 228088.80

Samples and Tests			Strata				
Depth	Type & No.	Date Records	Description	Depth, *Level* (Thickness)		Legend	Backfill/ Instrument
1.00 1.00-1.50 1.00-1.50	D 1 B 2 B 3		1 Spongy brown slightly sandy pseudofibrous PEAT.	(2.45)			
2.00 2.00-2.50 2.00-2.50	D 4 B 5 B 6						
2.50 2.50-2.70 2.50-2.70	D 7 B 8 B 9		2 Soft grey slightly sandy CLAY with interbedded with soft grey / light brown silt (marl).	2.45	+3.46		
			EXPLORATORY HOLE ENDS AT 2.70 m	2.70	+3.21		
Depth	Type & No.	Records Date					

Groundwater Entries

No.	Struck	Post Strike	Behaviour
	(m)		

None observed (see Key Sheet)

Depth Related Remarks

From	to (m)	
2.70		Trial pit terminated due to soft nature of ground and plant distance from the sidewalls.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBill (298), 16/02/2004 13:21:14

Project	N6 Galway City Outer Bypass Contract 2 Ground Investigation Gortatleva to Menlough
Project No.	KC3210
Carried out for	Galway County Council

Trial Pit

TP148

Sheet 1 of 1

Appendix A.9.1.1.3

N6 Galway City Outer Bypass Contract 3 Menlough to Garraun North – January to March 2004

Samples				Earthworks												
Hole	Depth	Type	Description	CBR Top	CBR Base	CBR Top w%	CBR Base w%	CBR Surch kg.	γ_b Mg/m^3	Comp Type	w% (Opt) <Nat>	γ_d (max) Mg/m^3	ρ_s Mg/m^3	% ret 20/ 37.5 mm	MCV
TP408	0.50-0.70	B	Silty very sandy GRAVEL							2.5kg	(11)	(1.51)	2.65	12/19	
				0.2	0.2	49	45	13.6	1.70	2.5kg	<47>	1.15			
				26	25	13	17	13.6	1.64	2.5kg	15	1.43			
				25	15	2.9	3.6	13.6	1.47	2.5kg	3.2	1.42			
				22	22	8.1	9.1	13.6	1.60	2.5kg	8.6	1.47			
				31	32	12	13	13.6	1.69	2.5kg	13	1.50			
									1.63	MCV	16	1.41		31	15.4
									1.67	MCV	2.1	1.63		31	13.8
									1.71	MCV	8.4	1.58		31	9.8
									1.74	MCV	12	1.56		31	12.6
TP412	0.50-1.00	B	Silty SAND and GRAVEL							2.5kg	(14)	(1.81)	2.65	4.0/6.5	
				0.7	1.0	24	23	13.6	2.02	2.5kg	<24>	1.63			
				3.7	2.8	19	18	13.6	2.06	2.5kg	19	1.74			
				22	13	15	16	13.6	2.08	2.5kg	15	1.80			
				30	34	11	12	13.6	2.00	2.5kg	12	1.79			
				36	30	7.4	7.3	13.6	1.88	2.5kg	7.4	1.75			
									1.93	MCV	21	1.60		11	3.6
									1.98	MCV	18	1.67		11	7.0
									2.07	MCV	14	1.81		11	12.4
									2.01	MCV	7.4	1.87		11	16.0
									1.99	MCV	7.2	1.86		11	14.3
TP415	0.50-0.70	B	Silty very sandy GRAVEL							2.5kg	(17)	(1.82)	2.65	12/9.4	
				0.3	0.3	28	28	13.6	1.97	2.5kg	<28>	1.54			
				3.1	2.8	20	23	13.6	2.04	2.5kg	21	1.68			
				23	25	8.8	8.8	13.6	1.73	2.5kg	8.8	1.59			
				20	22	13	10	13.6	1.92	2.5kg	12	1.72			
				19	25	15	16	13.6	2.09	2.5kg	15	1.81			
									1.87	MCV	26	1.49		21	1.8
									2.10	MCV	19	1.77		21	10.7
									1.97	MCV	6.4	1.85		21	17.1
									2.21	MCV	12	1.98		21	15.9
									2.09	MCV	13	1.85		21	12.6
									2.15	MCV	16	1.86		21	10.2
									2.04	MCV	16	1.75		21	8.2
TP419	1.00-1.30	B	Clayey very sandy GRAVEL							2.5kg	(12)	(1.94)	2.65	8.7/2.7	
				0.6	1.2	17	17	13.6	2.17	2.5kg	<17>	1.86			
				6.8	5.8	14	12	13.6	2.18	2.5kg	13	1.93			
				28	28	10	9.0	13.6	2.09	2.5kg	9.6	1.91			
				30	32	7.0	7.0	13.6	2.02	2.5kg	7.0	1.89			
				31	29	0.7	0.9	13.6	1.80	2.5kg	0.8	1.79			
									2.05	MCV	16	1.77		11	1.8
									2.12	MCV	11	1.90		11	8.4
									2.20	MCV	8.6	2.03		11	15.4
									2.02	MCV	6.3	1.90		11	15.2
									2.00	MCV	0.8	1.99		11	17.4

Remarks

Form 6/2

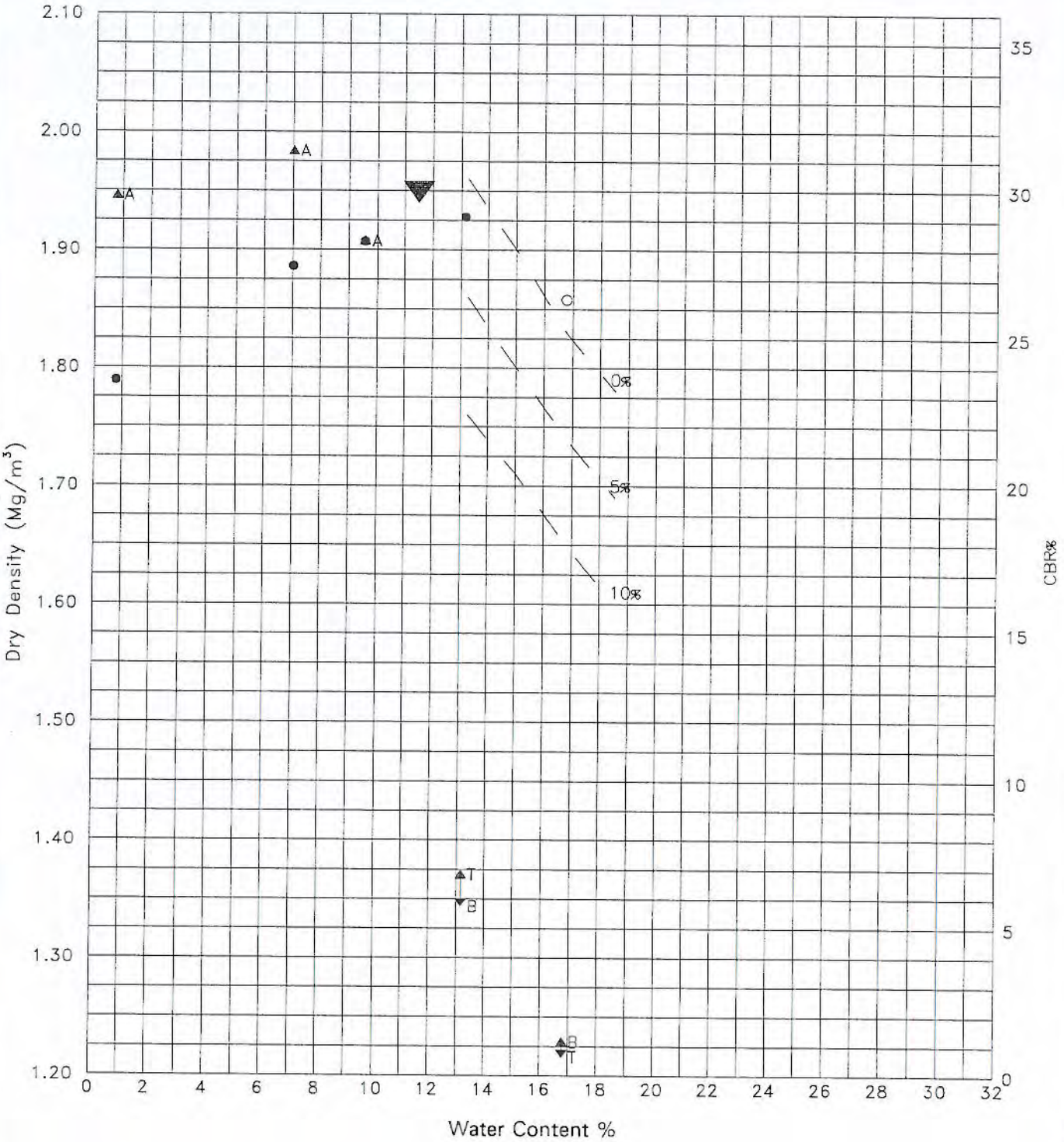
Laboratory - Compaction, CBR & MCV Summary

Exploration Associates

Project N6 Galway City Outer Bypass: Contract 3
Ground Investigation: Forramoyle West to Gortatleva
Galway County Council

Contract KC3267

Sheet 2



● Moisture Content/Dry Density
o Compaction at Natural Water Content
▼ Maximum Dry Density/Optimum Water Content
▼ CBR% Top
▲ CBR% Bottom
▲ CBR% Average (if Top and Bottom are within 10%)

Type of Test/Mould	2.5Kg/CBR		
Particle Density Assumed	2.65	Mg/m^3	
Maximum Dry Density	1.94	Mg/m^3	
Optimum Water Content	12	%	
% retained 37.5mm sieve	3		
% retained 20mm sieve	9		

Description: Clayey very sandy GRAVEL

Hole TP419
Depth 1.00 -1.30
Type B

Form 54/0

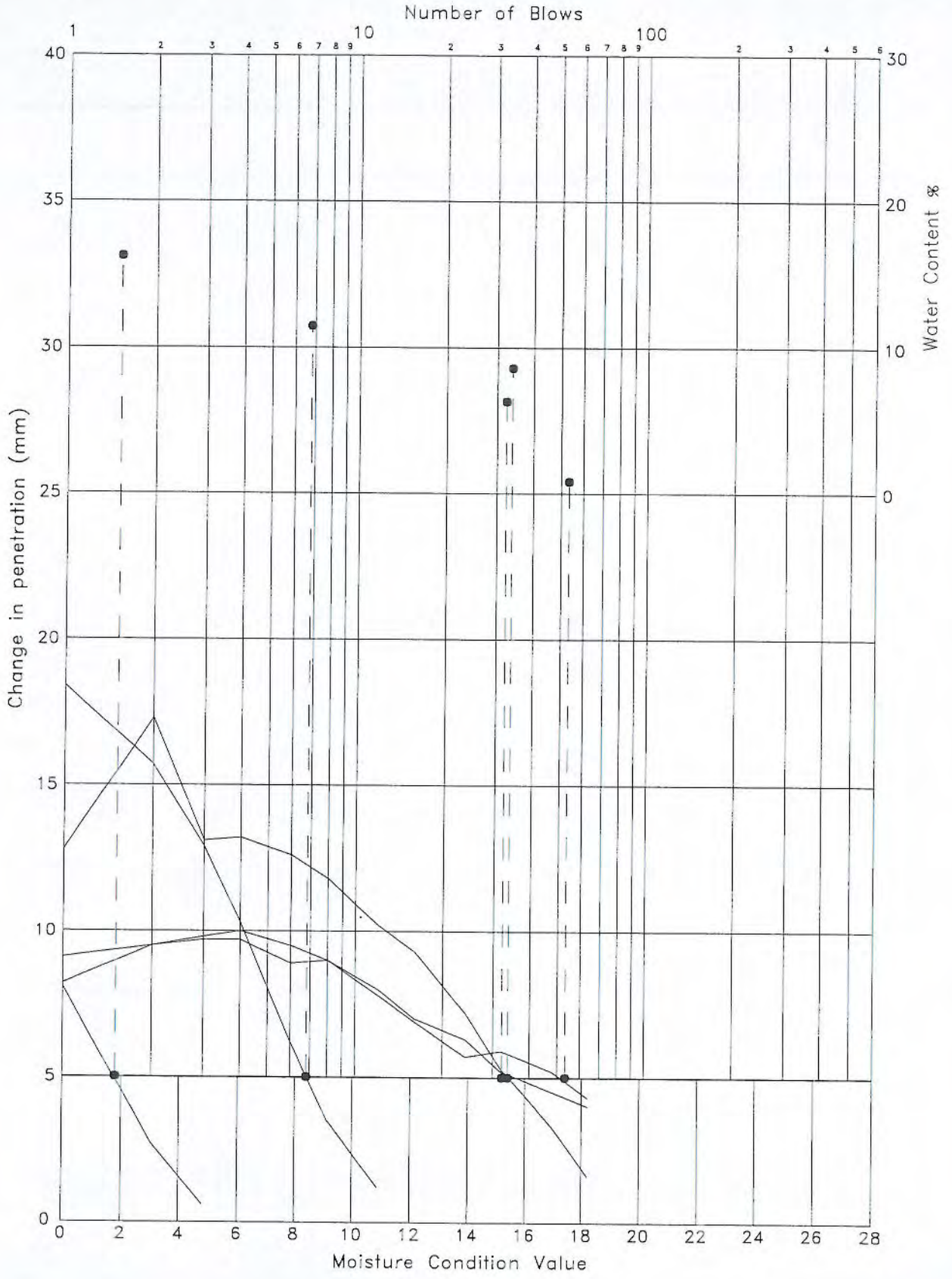
Remarks

Laboratory - Moisture Content/ Dry Density Relationship

Exploration Associates

Project
N6 Galway City Outer Bypass: Contract 3
Ground Investigation: Forramoyle West to Gortatleva
Galway County Council

Contract
KC3267



% retained on 20mm sieve 11	Description Clayey very sandy GRAVEL	Hole TP419 Depth 1.00 -1.30 Type B

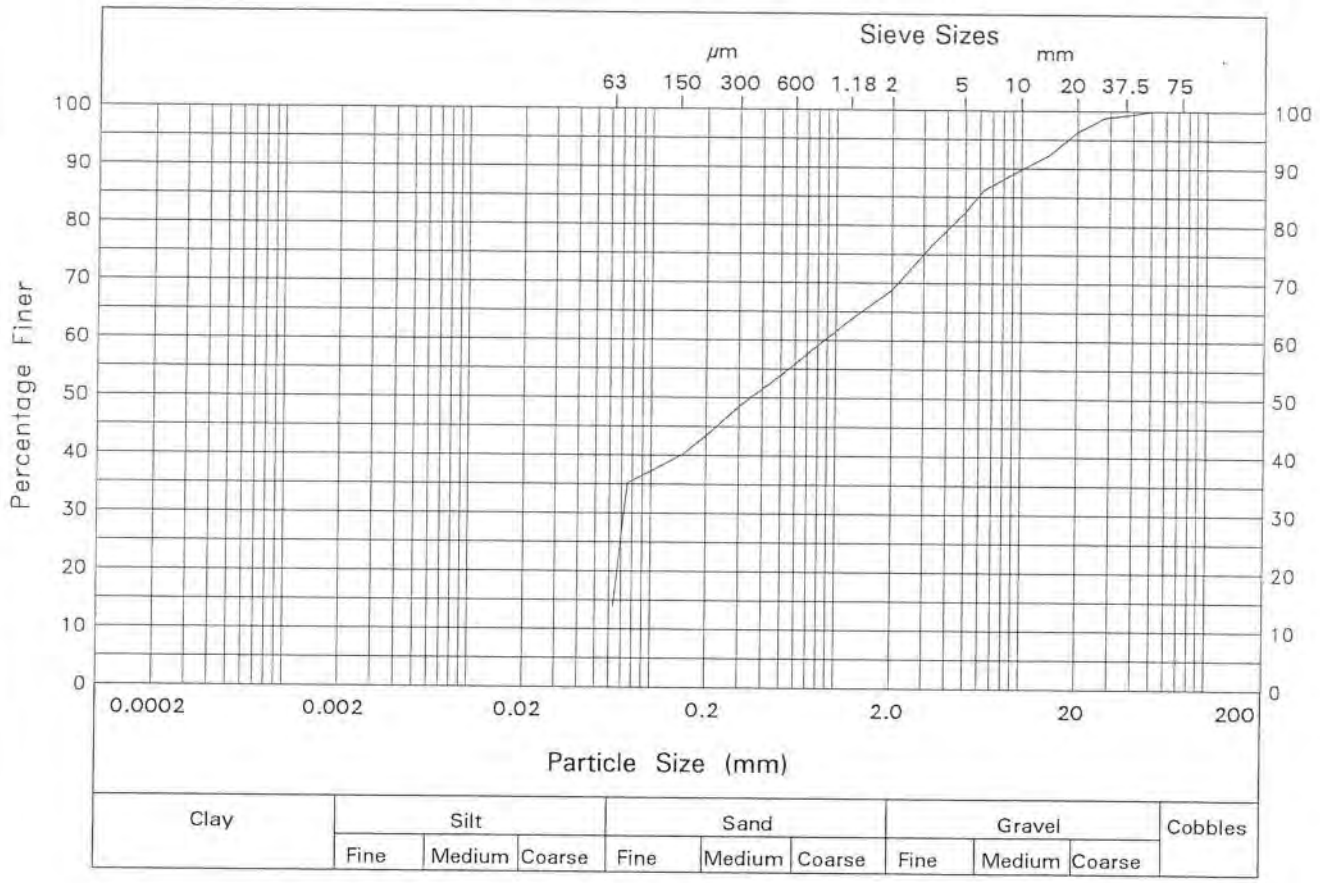
Remarks

Form 52/1

Laboratory - MCV Exploration Associates	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267

Point Load Test Data
Project: N6 Galway Bypass Contract 3
Project No.: KC3267

Borehole	Top Depth (mBGL)	Bottom Depth (mBGL)	Rock Description	Test Direction (PL/PD/R)	Core/Lump Diam/Width (mm)	Platen Separation D (initial) (mm)	D (failure) (mm)	Equiv Diam (mm)	Failure Loa (kN)	Is P/De^2 Mpa	Correction Factor $(De/50)^{0.45}$	**Is50 Is x F Mpa**	Remarks
Diametric Tests													
RC422	3.80	-	Granite	R	68	68	66	75.6	8.2	1.4	1.1	1.6	good fracture
RC422	4.17	-	Granite	PL	67	67	66	75.0	3.3	0.6	1.1	0.7	good fracture
RC422	6.35	-	Granite	R	68	68	66	75.6	9.0	1.6	1.1	1.8	good fracture
RC426	4.35	-	Granite	PL	67	67	64	73.9	28.0	5.1	1.1	5.9	good fracture possibly following incipient
RC426	8.40	-	Granite	PL	67	67	65	74.5	24.5	4.4	1.1	5.0	good fracture.
RC428A	2.30	-	Granite	R	67	67	64	73.9	27.0	4.9	1.1	5.6	good fracture possibly following incipient
RC428A	6.20	-	Granite	PL	67	67	64	73.9	25.0	4.6	1.1	5.2	good fracture
RC433	3.30	-	Granite	R	67	67	63	73.3	22.2	4.1	1.1	4.7	chipped fracture
RC435	2.43	-	Granite	R	68	68	59	71.5	30.2	5.9	1.1	6.8	good fracture.
RC435	7.10	-	Granite	PL	68	68	60	72.1	46.0	8.9	1.1	10.2	chipped fracture
RC437	2.20	-	Granite	PL	77	77	73	84.6	6.5	0.9	1.2	1.1	good fracture parallel to subvertical fracture
RC437	7.30	-	Granite	PL	77	77	77	86.9	50.0	6.6	1.2	8.0	no break
RC439	2.60	-	Granite	PL	79	79	75	86.9	24.0	3.2	1.2	3.9	good fracture possibly following incipient.
RC439	8.65	-	Granite	PL	76	76	73	84.0	21.4	3.0	1.2	3.7	good fracture
RC442A	7.53	-	Granite	R	78	78	74	85.7	12.9	1.8	1.2	2.1	good fracture possibly following incipient.
RC451	2.86	-	Granite	R	77	77	74	85.2	8.2	1.1	1.2	1.4	chipped fracture
RC451	4.07	-	Granite	R	77	77	74	85.2	5.0	0.7	1.2	0.8	good fracture
RC451A	1.20	-	Granite	R	76	76	74	84.6	5.0	0.7	1.2	0.8	good fracture possibly following incipient.
RC451A	3.55	-	Granite	PL	77	77	73	84.6	36.5	5.1	1.2	6.2	good fracture
RC455A	5.93	-	Granite	PL	78	78	78	88.0	50.0	6.5	1.2	7.9	no break
RC455A	7.45	-	Granite	PL	76	76	76	85.8	50.0	6.8	1.2	8.2	no break - slight chipping
RC457	4.64	-	Granite	R	80	80	73	86.2	9.5	1.3	1.2	1.6	chipped fracture possibly following incipient
RC457	5.54	-	Granite	R	76	76	74	84.6	20.2	2.8	1.2	3.4	fracture follows incipient fracture
RC464A	6.30	-	Granite	PL	79	79	78	88.6	4.1	0.5	1.2	0.6	good fracture
RC464A	7.90	-	Granite	PL	79	79	78	88.6	19.8	2.5	1.2	3.1	good fracture
RC467	2.60	-	Granite	PL	69	69	65	75.6	1.7	0.3	1.2	0.3	good fracture
RC467	8.25	-	Granite	R	69	69	59	72.0	39.0	7.5	1.2	8.7	good fracture
RC469	5.95	-	Granite	R	78	78	70	83.4	31.0	4.5	1.2	5.4	good fracture possibly following incipient

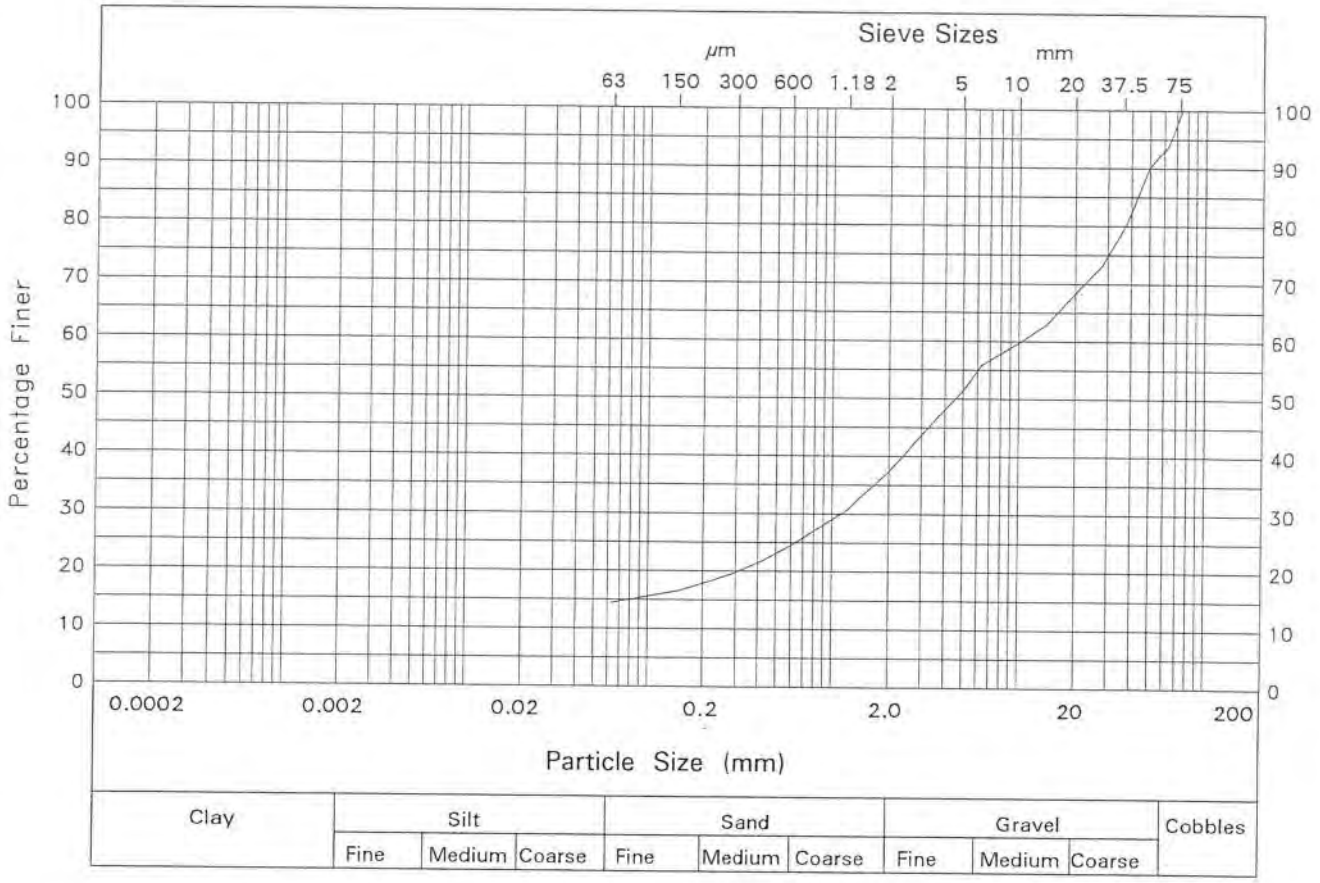


Particle Size	% Passing	Particle Size	% Passing
50 mm	100	425 μm	52
37.5 mm	99	300 μm	48
28 mm	99	212 μm	44
20 mm	96	150 μm	40
14 mm	92	75 μm	35
10 mm	90	63 μm	14
6.3 mm	86		
5 mm	82		
3.35 mm	77		
2 mm	69		
1.18 mm	63		
600 μm	56		

Hole BH424	Description: Clayey very gravelly SAND
Depth 0.80 -1.50	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

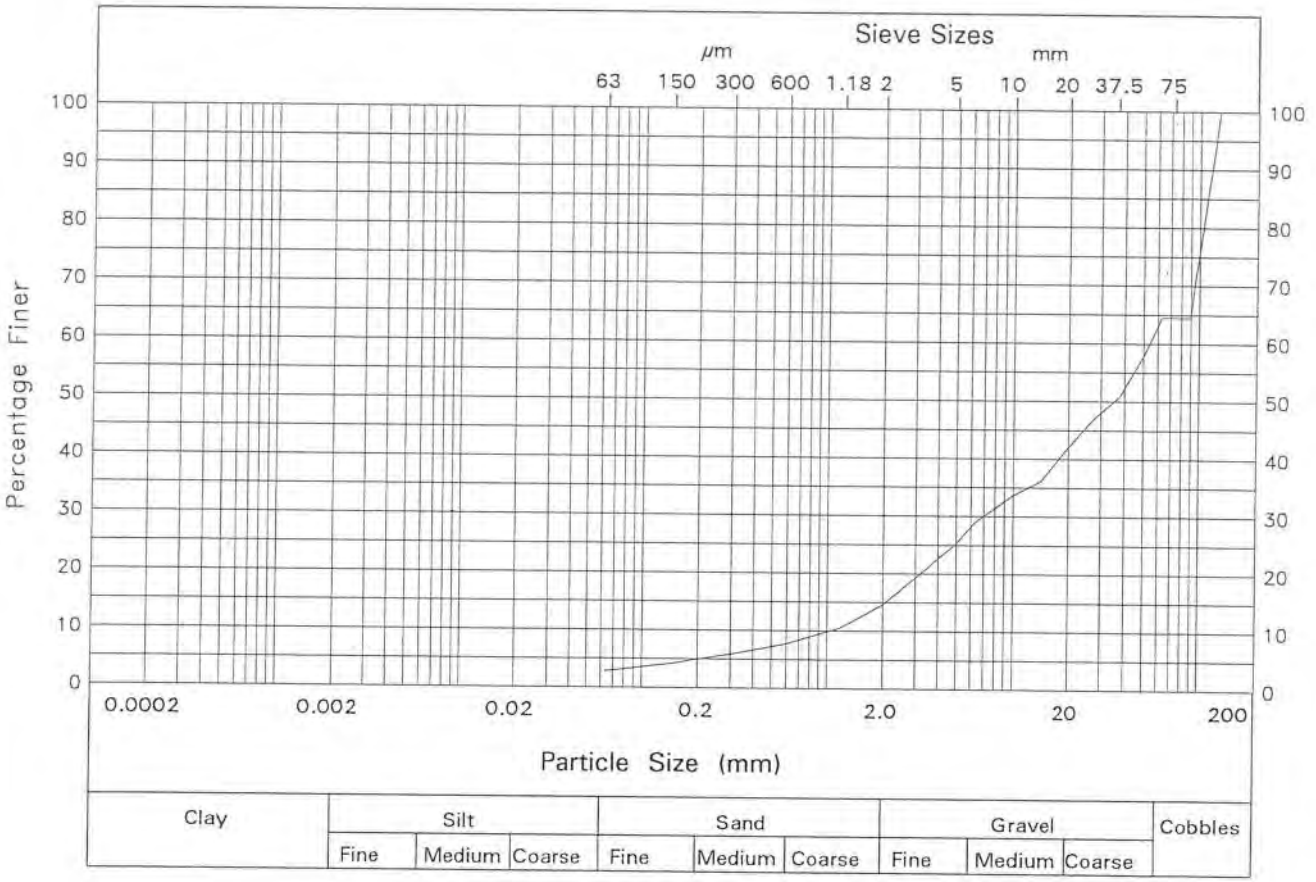


Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	31
63 mm	94	600 μm	25
50 mm	90	425 μm	22
37.5 mm	80	300 μm	20
28 mm	73	212 μm	18
20 mm	68	150 μm	17
14 mm	63	75 μm	15
10 mm	60	63 μm	14
6.3 mm	56		
5 mm	51		
3.35 mm	45		
2 mm	37		

Hole TP319A	Description MADE GROUND: Silty very sandy GRAVEL
Depth 0.50 -0.60	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

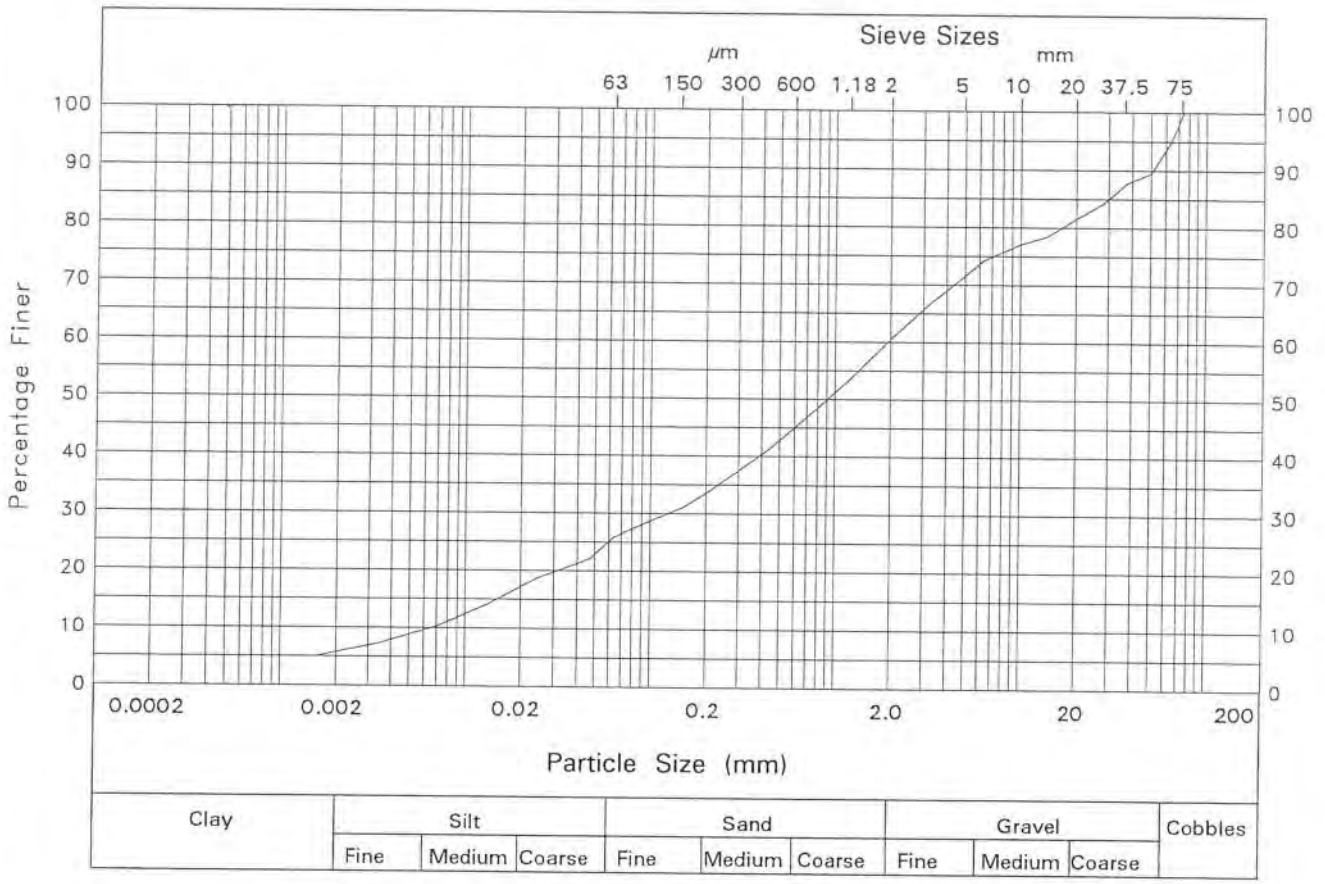


Particle Size	% Passing	Particle Size	% Passing
90 mm	65	2 mm	15
75 mm	65	1.18 mm	11
63 mm	65	600 μm	8
50 mm	58	425 μm	7
37.5 mm	51	300 μm	6
28 mm	47	212 μm	5
20 mm	42	150 μm	4
14 mm	36	75 μm	3
10 mm	34	63 μm	3
6.3 mm	29		
5 mm	25		
3.35 mm	21		

Hole TP322A	Description Slightly silty sandy GRAVEL
Depth 0.30 -0.60	
Type B	
Test Performed Wet	Uniformity Coefficient = 53

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

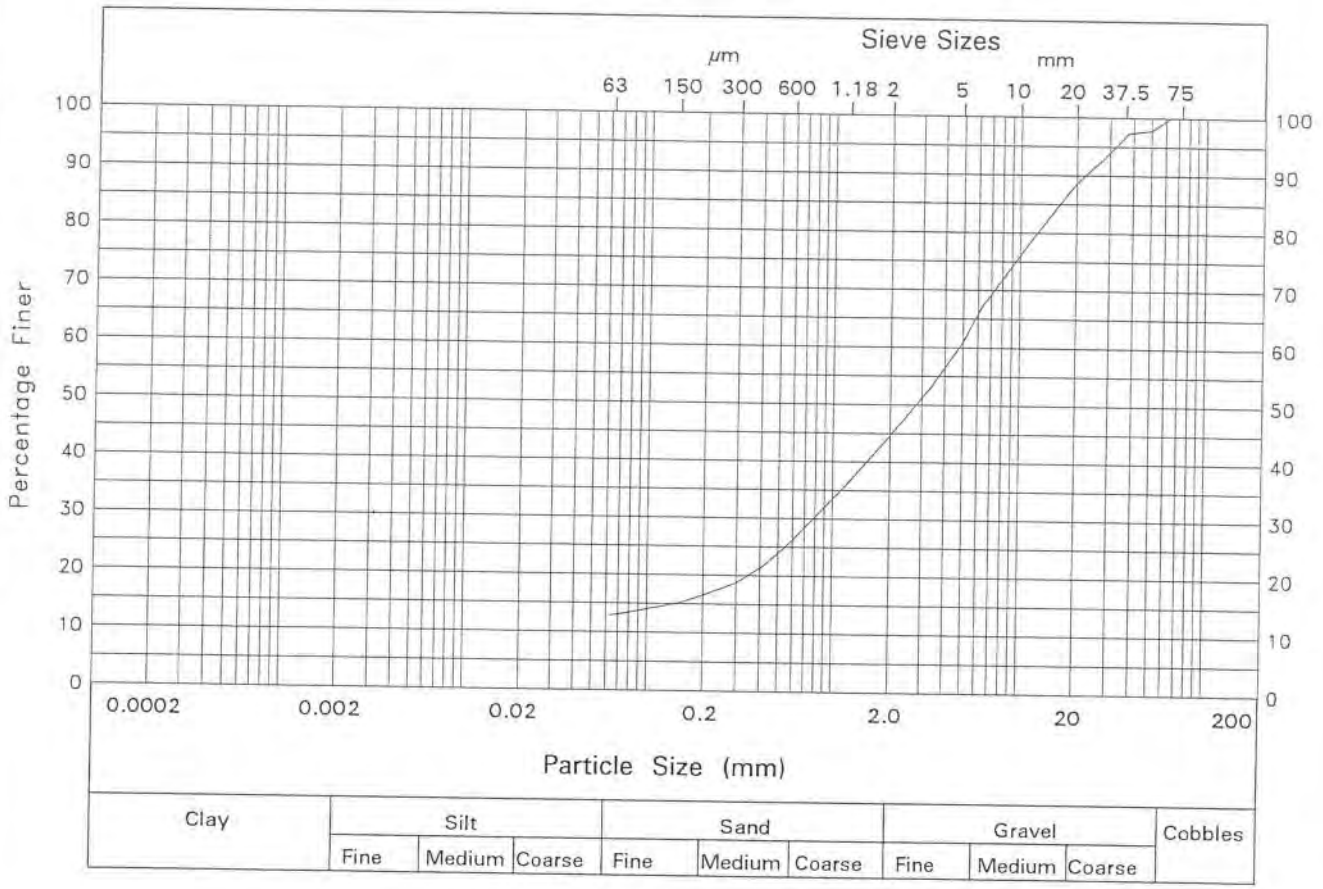


Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	53
63 mm	95	600 μm	45
50 mm	89	425 μm	41
37.5 mm	88	300 μm	37
28 mm	84	212 μm	34
20 mm	82	150 μm	31
14 mm	78	75 μm	27
10 mm	77	63 μm	26
6.3 mm	74	47 μm	22
5 mm	71	25 μm	19
3.35 mm	67	13 μm	14
2 mm	61		

Hole TP324	Description: Slightly sandy to sandy gravelly organic CLAY
Depth 0.70 -0.90	
Type B	
Test Performed Dry	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

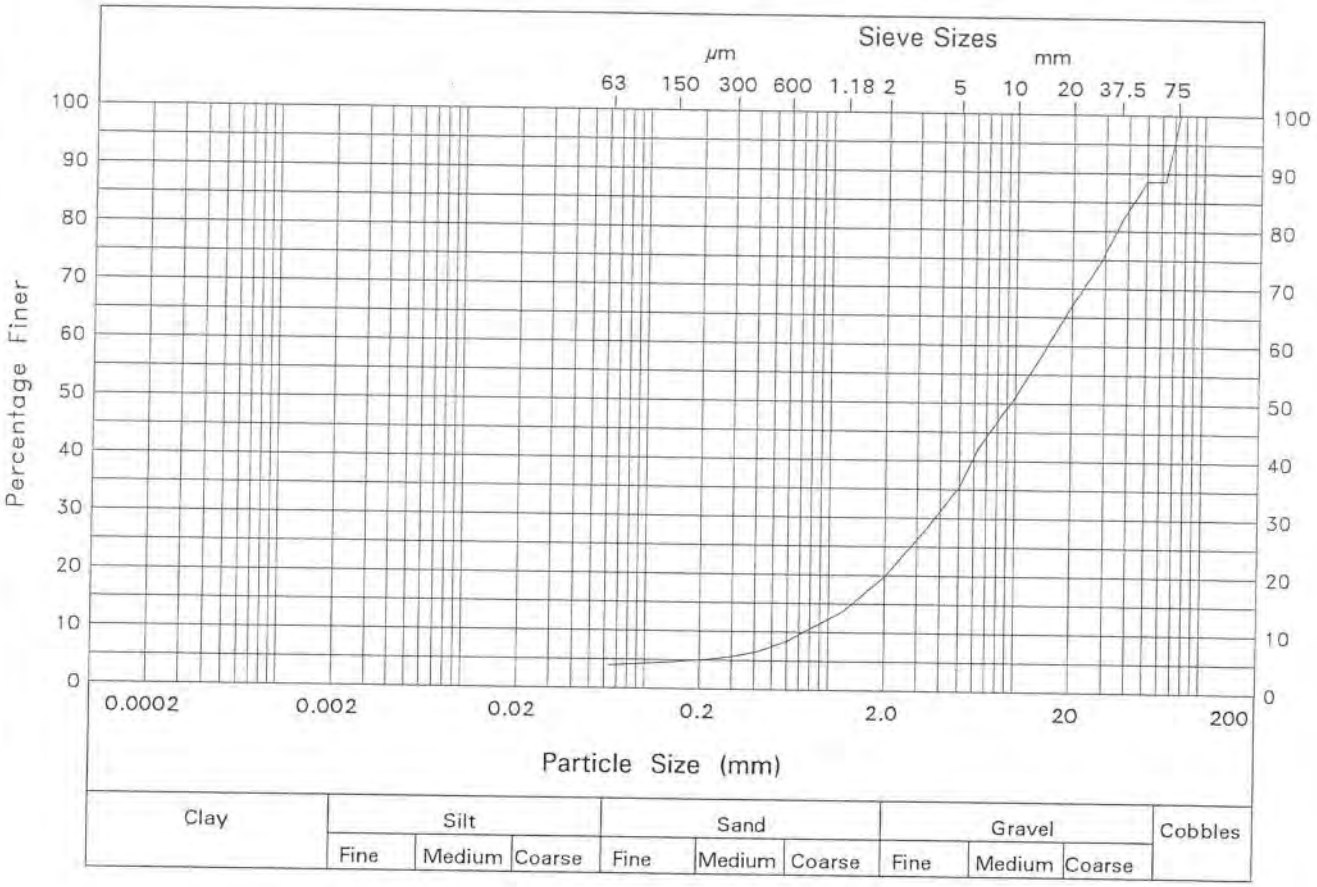


Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	26
50 mm	98	425 μm	22
37.5 mm	97	300 μm	19
28 mm	93	212 μm	17
20 mm	89	150 μm	15
14 mm	82	75 μm	13
10 mm	76	63 μm	13
6.3 mm	67		
5 mm	61		
3.35 mm	53		
2 mm	45		
1.18 mm	36		

Hole TP419	Description: Clayey very sandy GRAVEL
Depth 1.00 -1.30	
Type B	
Test Performed Wet	Uniformity Coefficient not applicable.

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

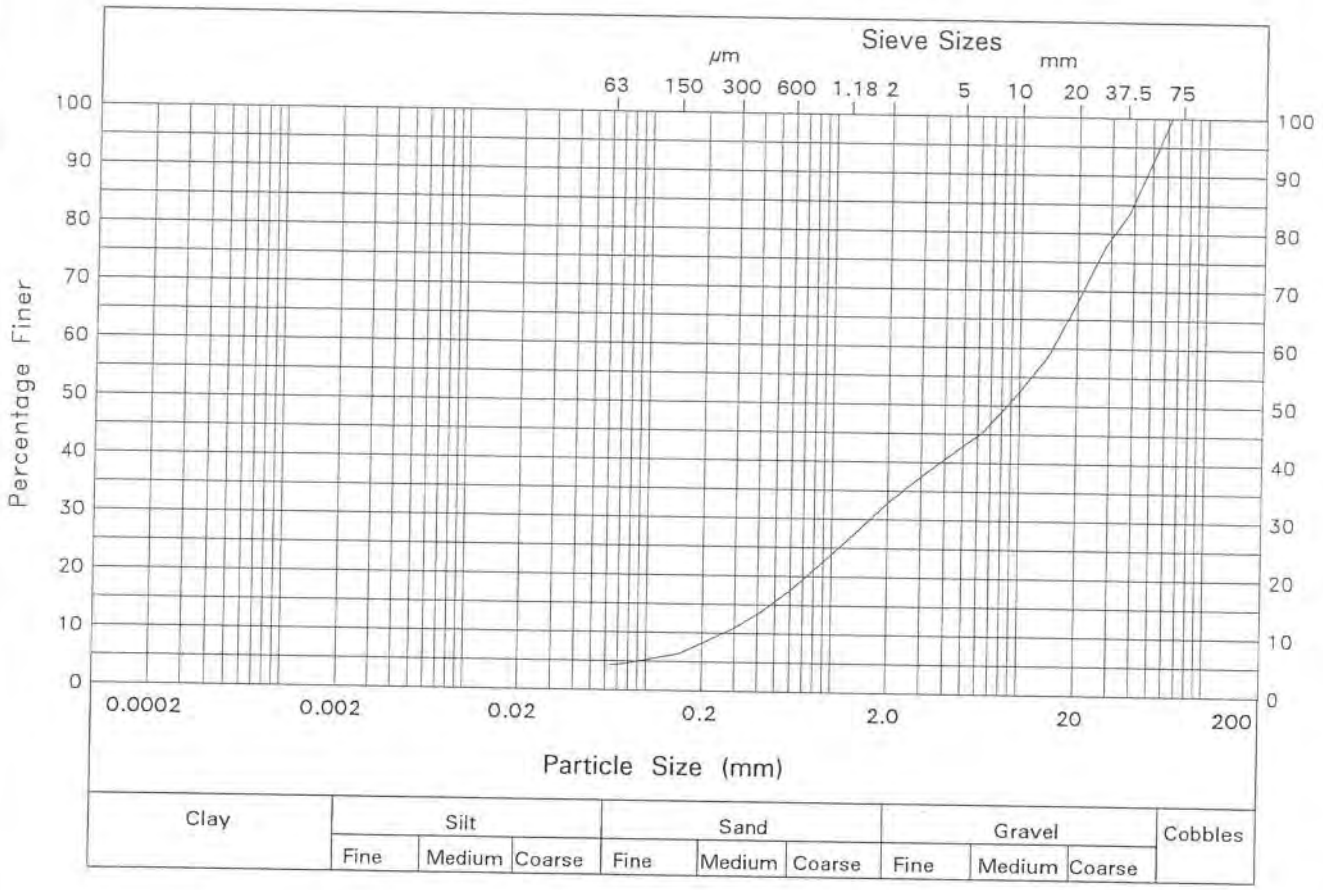


Particle Size	% Passing	Particle Size	% Passing
75 mm	100	1.18 mm	14
63 mm	89	600 μm	8
50 mm	89	425 μm	7
37.5 mm	82	300 μm	6
28 mm	74	212 μm	5
20 mm	67	150 μm	5
14 mm	59	75 μm	4
10 mm	51	63 μm	4
6.3 mm	42		
5 mm	35		
3.35 mm	28		
2 mm	20		

Hole TP423	Description Slightly silty sandy GRAVEL
Depth 1.00 -1.40	
Type B	
Test Performed Wet	Uniformity Coefficient = 19

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**



Particle Size	% Passing	Particle Size	% Passing
63 mm	100	600 μm	18
50 mm	92	425 μm	14
37.5 mm	84	300 μm	11
28 mm	78	212 μm	9
20 mm	68	150 μm	6
14 mm	59	75 μm	5
10 mm	52	63 μm	4
6.3 mm	45		
5 mm	43		
3.35 mm	39		
2 mm	33		
1.18 mm	26		

Hole TP425	Description Silty very sandy GRAVEL
Depth 0.10 -0.30	
Type B	
Test Performed Wet	Uniformity Coefficient = 57

Form 25/4

Laboratory - Particle Size Plot	**Project** N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Coolatleva Galway County Council	**Contract** KC3267
Exploration Associates		**Sheet**

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m^3	Test	σ_3 kPa	C kPa	
BH358	1.20	D	PEAT				994					pH = 4.8 SO3 (2:1) = 0.60g/l Passing 2mm = 77%
BH358	1.50 - 1.95	D	PEAT				1051					
BH358	2.20	D	PEAT				1044					
BH358	2.85 - 3.30	D	Slightly sandy gravelly CLAY				18					
BH424	0.20	D	PEAT				144					Org = 6.8% Passing 2mm = 51%
BH424	0.80 - 1.50	B	Clayey very gravelly SAND									pH = 7.0 Particle Size analysis SO3 (2:1) = 0.10g/l Passing 2mm = 64%
BH424	1.00	D	Clayey very gravelly SAND				11					
BH424	1.20	D	Clayey very gravelly SAND				23					
TP319A	0.50	D	MADE GROUND: Silty very sandy GRAVEL				37					
TP319A	0.50 - 0.60	B	MADE GROUND: Silty very sandy GRAVEL	57 29	425µ 95	Sieve 66						Particle Size analysis
TP321	0.10	D	TOPSOIL: Slightly sandy CLAY				117					
TP322A	0.30 - 0.60	B	Slightly silty sandy GRAVEL	52 56	425µ 132	Sieve 76						pH = 5.4 Particle Size analysis SO3 (2:1) = 0.11g/l Passing 2mm = 40%
TP322A	0.30 - 0.60	B	Slightly silty sandy GRAVEL				28					
TP323	0.50	D	PEAT				1094					
TP323	1.00	D	PEAT				701					Org = 6.8% Passing 2mm = 53% pH = 3.5 SO3 (2:1) = 0.75g/l Passing 2mm = 53%
TP324	0.50	D	PEAT				318					
TP324	0.70 - 0.90	B	Slightly sandy to sandy gravelly organic CLAY	68 22	425µ 67	Sieve 45						Particle Size analysis

Remarks

Form 10/2

Laboratory - Results Summary

Exploration Associates

Project
N6 Galway City Outer Bypass: Contract 3
Ground Investigation: Forramoyle West to Gortatleva
Galway County Council

Contract
KC3267

Sheet
1

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m^3	Test	σ_3 kPa	C kPa	
TP324	0.70	D	Slightly sandy to sandy gravelly organic CLAY				30					
TP325A	0.50	D	PEAT				883					
TP326	0.50	D	PEAT				1373					
TP326	1.00	D	Slightly sandy gravelly organic CLAY				75					
TP326	1.00 - 1.20	B	Slightly sandy gravelly organic CLAY	67 63	425µ 128	Sieve 65						Particle Size analysis
TP327	0.50	D	PEAT				1019					
TP328	0.50	D	PEAT				1305					
TP328	0.50 - 1.00	B	PEAT									Org = 11.0% Passing 2mm = 77% pH = 5.4 SO3 (2:1) = 0.46g/l Passing 2mm = 77%
TP328	1.50	D	PEAT				1008					
TP328A	0.50	D	PEAT				1028					
TP328A	1.50	D	PEAT				990					
TP328A	1.50 - 2.00	B	PEAT									pH = 5.2 Ps = 1.08 measured SO3 (2:1) = 0.59g/l Passing 2mm = 53%
TP328A	2.50	D	PEAT				1133					
TP330A	1.00	D	PEAT				813					
TP330A	1.00	B	PEAT									Org = 11.7% Passing 2mm = 57%
TP330A	2.00	D	PEAT				1306					
TP332	1.00	D	PEAT				851					
TP332	2.00	D	Very clayey SAND and GRAVEL				18					
TP332	2.00	B	Very clayey SAND and GRAVEL									Particle Size analysis
TP334	0.50	D	PEAT				1286					

Remarks

Form 10/2

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	$\gamma_{b\,3}$ Mg/m	Test	σ_3 kPa	C kPa	
TP413	0.30	D	PEAT				46					
TP413A	0.50	D	Clayey SAND and GRAVEL				18					
TP413A	1.50	B	Clayey SAND and GRAVEL									pH = 6.6 Particle Size analysis SO3 (2:1) = 0.07g/l Passing 2mm = 56%
TP413A	1.50	D	Clayey SAND and GRAVEL				7.7					
TP413B	0.70	D	Very clayey peaty GRAVEL				33					
TP413B	1.50	B	Clayey very sandy GRAVEL									Particle Size analysis Water soluble chloride content = 0.011%
TP413B	1.50	D	Clayey very sandy GRAVEL				21					
TP415	0.50	D	Silty very sandy GRAVEL				17					
TP415	0.50 - 0.70	B	Silty very sandy GRAVEL	49 13	425µ 44	Sieve 31						w% / Dry Density MCV pH = 6.0 Particle Size analysis SO3 (2:1) = 0.06g/l Passing 2mm = 55%
TP415	1.50	D	Sandy slightly gravelly CLAY				27					
TP417	0.20 - 0.40	B	Clayey sandy GRAVEL	47	425µ 56	Sieve NP						Particle Size analysis
TP417	0.30	D	Clayey sandy GRAVEL				18					
TP419	0.40 - 0.60	B	TOPSOIL: Slightly sandy slightly gravelly slightly organic CLAY									Org = 3.5% Passing 2mm = 62%
TP419	0.60	D	TOPSOIL: Slightly sandy slightly gravelly slightly organic CLAY				24					
TP419	1.00	D	Clayey very sandy GRAVEL				13					
TP419	1.00 - 1.30	B	Clayey very sandy GRAVEL	30 10	425µ 33	Sieve 23						w% / Dry Density MCV Particle Size analysis
TP423	0.40	D	TOPSOIL: Slightly sandy CLAY				24					

Remarks

Form 10/2

Laboratory - Results Summary

Exploration Associates

Project
N6 Galway City Outer Bypass: Contract 3
Ground Investigation: Forramoyle West to Gortatleva
Galway County Council

Contract
KC3267

Sheet
6

Samples				Classification					Strength			Other Tests
Hole	Depth	Type	Description	<425 I_P	Prep w_L	w_P	Water %	γ_b Mg/m 3	Test	σ_3 kPa	C kPa	
TP423	1.00	D	Slightly silty sandy GRAVEL				12					
TP423	1.00 - 1.40	B	Slightly silty sandy GRAVEL	23 12	425µ 54	Sieve 42						Org = 3.5% Passing 2mm = 32% Particle Size analysis
TP423A	0.50	D	PEAT				600					
TP423A	0.50 - 1.00	B	PEAT									pH = 5.9 Ps = 1.25 measured SO3 (2:1) = 0.57g/l Passing 2mm = 57%
TP423A	2.00	D	PEAT				11					
TP425	0.10 - 0.30	B	Silty very sandy GRAVEL	42 65	425µ 148	Sieve 83						Particle Size analysis
TP425	0.30	D	Silty very sandy GRAVEL				32					
TP425	1.00	D	Slightly sandy gravelly CLAY				14					
TP427	0.20	D	PEAT				64					
TP429	0.20	D	PEAT				476					
TP429	1.00	D	Silty sandy GRAVEL				58					Org = 5.9% Passing 2mm = 26% pH = 5.4 SO3 (2:1) = 0.06g/l Passing 2mm = 26%
TP429	1.00	B	Silty sandy GRAVEL	59 26	425µ 89	Sieve 63						Particle Size analysis
TP432	0.50	D	MADE GROUND: Clayey very sandy GRAVEL				21					
TP432	0.50 - 1.00	B	MADE GROUND: Clayey very sandy GRAVEL									w% / Dry Density CBR pH = 6.9 Particle Size analysis SO3 (2:1) = 0.17g/l Passing 2mm = 62%
TP432	1.50	D	MADE GROUND: Clayey very sandy GRAVEL				21					
TP432	1.50 - 2.00	B	MADE GROUND: Clayey very sandy GRAVEL									Particle Size analysis
TP434	0.50	D	PEAT				851					

Remarks

Form 10/2

Borehole Log

Drilled by MK Logged by DB Checked by ROR	Start 28/01/2004 End 28/01/2004	Equipment, Methods and Remarks Dando 175 Cable Percussion 150mm diameter from 0.0m to 1.55m.	Depth from 0.00m to 1.55m Diameter 150mm Casing Depth	Ground Level +21.52 mOD Coordinates E 124527.99 National Grid N 224612.43

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.20 0.20	D 1 W 4		28/01/2004	0800
0.50-0.85	U 2	55 blows		
0.80-1.50	B 6			
1.00	D 3			
1.20	D 5			
1.50-1.58	SPT S	100 (25 for 50mm/100 for 25mm)	28/01/2004 1.50	1000 0.60

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Plastic dark pseudo fibrous PEAT	(0.80)		
Coarse SAND and GRAVEL** Recovered as clayey very gravelly SAND, locally grey sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of granite.	0.80 +20.72 (0.70)		
GRANITE**	1.50 +20.02		
EXPLORATORY HOLE ENDS AT 1.55 m	1.55 +19.97		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	0.80	Rose to 0.20 m after 20 minutes.	-

Depth Related Remarks

From	to (m)	
1.55		Borehole terminated on obstruction - presumed bedrock.

Chiselling

Depths (m)	Time	Tools used
1.50 -1.55	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBill (298), 22/03/2004 10:49:01 AGS

Project: N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.: KC3267
Carried out for: Galway County Council

Borehole
BH424
Sheet 1 of 1

Groundwater Monitoring

Hole No.	Instrument Type	Tip Depth (mBGL)	Reading				
			Date	Time (hhmmss)	Water Level (mBGL)	Head (m above Tip)	Comments
BH358	SP	3.20	19 Feb 2004		0.25	2.95	
BH358	SP	3.20	29 Mar 2004		0.25	2.95	
BH358	SP	3.20	14 Apr 2004		0.20	3.00	
RC394A	SP	6.00	11 Mar 2004		0.00	6.00	
RC394A	SP	6.00	29 Mar 2004		0.19	5.81	
RC394A	SP	6.00	14 Apr 2004		0.00	6.00	
RC402	SPIE	15.30	29 Mar 2004		1.68	13.62	
RC402	SPIE	15.30	14 Apr 2004		0.10	15.20	
RC404	SPIE	13.80	14 Apr 2004		0.80	13.00	
RC407	SPIE	10.00	11 Mar 2004		2.10	7.90	
RC407	SPIE	10.00	29 Mar 2004		1.28	8.72	
RC407	SPIE	10.00	14 Apr 2004		1.40	8.60	
RC422	SP	7.00	19 Feb 2004		0.90	6.10	
RC422	SP	7.00	29 Mar 2004		0.97	6.03	
RC422	SP	7.00	14 Apr 2004		0.80	6.20	
RC428A	SPIE	8.00	11 Mar 2004		0.10	7.90	
RC428A	SPIE	8.00	29 Mar 2004		0.10	7.90	
RC428A	SPIE	8.00	14 Apr 2004		0.14	7.86	
RC435	SPIE	7.00	19 Feb 2004		2.19	4.81	
RC435	SPIE	7.00	29 Mar 2004		2.10	4.90	
RC435	SPIE	7.00	14 Apr 2004		2.00	5.00	
RC442A	SP	4.50	11 Mar 2004		0.10	4.40	Borehole blocked at 5.50m.
RC442A	SP	4.50	11 Mar 2004		0.10	4.40	Borehole blocked at 5.50m.
RC442A	SP	4.50	29 Mar 2004		0.27	4.23	
RC442A	SP	4.50	14 Apr 2004		0.30	4.20	
RC451A	SP	10.00	19 Feb 2004		1.88	8.12	
RC451A	SP	10.00	29 Mar 2004		0.80	9.20	
RC451A	SP	10.00	14 Apr 2004		0.50	9.50	
RC455A	SPIE	10.00	11 Mar 2004		6.70	3.30	
RC455A	SPIE	10.00	29 Mar 2004		6.63	3.37	
RC455A	SPIE	10.00	14 Apr 2004		6.50	3.50	
RC464A	SP	8.60	11 Mar 2004		0.50	8.10	
RC464A	SP	8.60	29 Mar 2004		0.49	8.11	
RC464A	SP	8.60	14 Apr 2004		0.20	8.40	
RC469	SPIE	4.80	11 Mar 2004		3.50	1.30	Borehole blocked at 5.80m.
RC469	SPIE	4.80	11 Mar 2004		3.50	1.30	Borehole blocked at 5.80m.
RC469	SPIE	4.80	29 Mar 2004		3.01	1.79	
RC469	SPIE	4.80	14 Apr 2004		2.60	2.20	
RC4B	SPIE	10.70	29 Mar 2004		1.94	8.76	
RC4B	SPIE	10.70	14 Apr 2004		2.20	8.50	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Project: N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.: KC3267
Carried out for: Galway County Council

Sheet: Sheet 1 of 1

Groundwater Monitoring

GEOTECH

Hole No.	Instrument Type	Tip Depth (mBGL)	Reading				
			Date	Time (hhmmss)	Water Level (mBGL)	Head (m above Tip)	Comments
BH358	SP	3.20	19 Feb 2004		0.25	2.95	
BH358	SP	3.20	29 Mar 2004		0.25	2.95	
RC394A	SP	6.00	11 Mar 2004		0.00	6.00	
RC394A	SP	6.00	29 Mar 2004		0.19	5.81	
RC402	SPIE	15.30	29 Mar 2004		1.68	13.62	
RC404	SPIE	13.80	29 Mar 2004		1.05	12.75	
RC407	SPIE	10.00	11 Mar 2004		2.10	7.90	
RC407	SPIE	10.00	29 Mar 2004		1.28	8.72	
RC422	SP	7.00	19 Feb 2004		0.90	6.10	
RC422	SP	7.00	29 Mar 2004		0.97	6.03	
RC428A	SPIE	8.00	11 Mar 2004		0.10	7.90	
RC428A	SPIE	8.00	29 Mar 2004		0.10	7.90	
RC435	SPIE	7.00	19 Feb 2004		2.19	4.81	
RC435	SPIE	7.00	29 Mar 2004		2.10	4.90	
RC442A	SP	4.50	11 Mar 2004		0.10	4.40	Borehole blocked at 5.50m.
RC442A	SP	4.50	29 Mar 2004		0.27	4.23	Borehole blocked at 5.50m.
RC451A	SP	10.00	19 Feb 2004		1.88	8.12	
RC451A	SP	10.00	29 Mar 2004		0.80	9.20	
RC455A	SPIE	10.00	11 Mar 2004		6.70	3.30	
RC455A	SPIE	10.00	29 Mar 2004		6.63	3.37	
RC464A	SP	8.60	11 Mar 2004		0.50	8.10	
RC464A	SP	8.60	29 Mar 2004		0.49	8.11	
RC469	SPIE	4.80	11 Mar 2004		3.50	1.30	Borehole blocked at 5.80m.
RC469	SPIE	4.80	29 Mar 2004		3.01	1.79	Borehole blocked at 5.80m.
RC4B	SPIE	10.70	29 Mar 2004		1.94	8.76	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Project: N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No.: KC3267

Carried out for: Galway County Council

Borehole Log

Drilled by Hillard's Logged by DB Checked by ROR	Start 17/02/2004 End 18/02/2004	Equipment, Methods and Remarks Rotary Cored 65mm diameter from 0.0m to 0.00m to 7.0m.	Depth from to Diameter Casing Depth 0.00m 7.00m 65mm	Ground Level +21.20 mOD Coordinates E 124228.33 National Grid N 224712.65

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				17/02/2004	0800
0.00-1.00	0 N/A N/A				
1.00-2.50	23 N/A N/A				
2.50-4.00	87 67 0			17/02/2004	1800
				18/02/0004	0800
3.80			CS 1		
4.17			CS 2		
4.00-5.50	97 97 0	NI 60 130			
5.50-7.00	76 76 9				
6.35			CS 3		
				18/02/2004	1800

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Sandy gravelly CLAY**	(1.30)		
Weathered GRANITE** Recovered as pink / grey GRAVEL with occasional cobbles. Gravel is subrounded fine to coarse. Cobbles are subrounded of granite.	1.30 +19.90 (1.20)		
Moderately strong to strong pink medium to coarse grained porphritic GRANITE. Core is cross cut by incipient fractures and quartz veins up to 2mm thick with no set spacing or orientation Weathering: Core recovered as fresh. Discontinuities: Set 1: Subhorizontal 0° - 10° closely spaced undulating and rough fractures, fresh. Set 2: Subvertical 65° -75° possibly widely spaced (hard to determine due to the fragmented nature of core) undulating and rough fractures, fresh.	2.50 +18.70 (4.50)		
EXPLORATORY HOLE ENDS AT 7.00 m	7.00 +14.20		SP

Depth | TCR SCR RQD | If | Records/Samples | Date Casing | Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks
From to (m)

Chiselling
Depths (m) Time Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50 (c) MESG HBN (298), 23/03/2004 11:25:01 AGS

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No. KC3267
Carried out for Galway County Council

Borehole
RC422
Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 05/02/2004 End 05/02/2004	Equipment, Methods and Remarks No excavating equipment used. Machine unable to gain access to location.	Dimensions and Orientation Width - Length -	Ground Level +14.29 mOD Coordinates E 121265.86 National Grid N 222589.05

Samples and Tests

Depth	Type & No.	Date Records

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 Moss, thin soil and grass covering over GRANITE outcrop.	0.10 +14.19		
EXPLORATORY HOLE ENDS AT 0.10 m			

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck	Post Strike (m)	Behaviour
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
0.10		Trial pit terminated on presumed bedrock.

Stability

Shoring

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (296), 08/04/2004 12:25:37

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP316A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 23/01/2004 End 23/01/2004	Equipment, Methods and Remarks No excavating equipment used Trial pit located on bedrock or boulders.	Dimensions and Orientation Width - Length -	Ground Level +15.79 mOD Coordinates E 121290.11 National Grid N 222684.78 Offset (m) 0.00

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 Moderately strong grey coarse grained crystalline GRANITE.	0.00 +15.79		
			EXPLORATORY HOLE ENDS AT 0.00 m			
Depth	Type & No.	Records Date				

Groundwater Entries	Depth Related Remarks	
No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)	From to (m)	Stability Shoring Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG Hill (286), 22/03/2004 12:36:34 AGS

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP317

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 23/01/2004 End 23/01/2004	Equipment, Methods and Remarks No excavating equipment used. Trial pit located on bedrock or boulder	Dimensions and Orientation Width - Length -	Ground Level +26.30 mOD Coordinates E 121291.17 National Grid N 222875.86

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instrument
			1 Moderate to strong grey coarse grained crystalline GRANITE	0.10 +26.20		
			EXPLORATORY HOLE ENDS AT 0.10 m			
Depth	Type & No.	Records Date				

Groundwater Entries	Depth Related Remarks	
No. Struck Post Strike Behaviour (m)	From to (m)	Stability
None observed (see Key Sheet)		Shoring
		Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (296), 22/03/2004 12:36:39 AGS

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No. KC3267
Carried out for Galway County Council

Trial Pit
TP318
Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 04/02/2004 End 04/02/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.55 m Length 2.10 m 60 (Deg)	Ground Level +29.21 mOD Coordinates E 121273.23 National Grid N 222974.87

Samples and Tests

Depth	Type & No.	Date Records
0.50	D 1	
0.50-0.60	B 2	
0.50-0.60	B 3	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 MADE GROUND: Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular, fine to coarse.	(0.30)		
	0.30 +28.91		
2 MADE GROUND: Silty very sandy GRAVEL with many cobbles and boulders. Locally light brown slightly sandy gravelly CLAY. Gravel is subangular, fine to coarse. Cobbles and boulders are of granite, limestone, diorite and quartzite.	(0.30)		
EXPLORATORY HOLE ENDS AT 0.60 m	0.60 +28.61		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
None observed (see Key Sheet)		

Depth Related Remarks

From	to (m)	
0.60		Trial pit terminated on obstruction - presumed bedrock

Stability Stable

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG RBH (298), 22/03/2004 12:26:44 AGS

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP319A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 05/02/2004 End 05/02/2004	Equipment, Methods and Remarks On foot with shovel	Dimensions and Orientation Width - Length -	Ground Level +32.48 mOD Coordinates E 121244.13 National Grid N 223071.74

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 Firm brown slightly sandy CLAY with many plant roots	0.10 +32.38		
			EXPLORATORY HOLE ENDS AT 0.10 m			
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck	Post	Strike Behaviour (m)
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
0.10		Trial pit terminated on obstruction - presumed bedrock of granite.

Stability good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 22/03/2004 12:36:49 AGS

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP320

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 23/01/2004 End 23/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.40 m Length 4.00 m 4 (Deg)	Ground Level +37.94 mOD Coordinates E 121159.38 National Grid N 223274.50

Samples and Tests

Depth	Type & No.	Date Records
0.10	D 1	
0.10-0.30	B 2	
0.10-0.30	B 3	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm dark brown slightly sandy CLAY with many rootlets	(0.30)		
2 Firm grey gravelly CLAY with occasional cobbles. Gravel is subangular, fine to coarse of granite. Cobbles are subangular to subrounded of granite	0.30 +37.64		
EXPLORATORY HOLE ENDS AT 0.40 m	0.40 +37.54		

Depth	Type & No.	Records Date

Groundwater Entries

No. Struck	Post Strike (m)	Behaviour
None observed (see Key Sheet)		

Depth Related Remarks

From	to (m)	
0.40		Trial pit terminated on obstruction- presumed bedrock

Stability good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 23/03/2004 12:34:53

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP321

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 04/02/2004 End 04/02/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.70 m Length 2.80 m 250 (Deg)	Ground Level +39.08 mOD Coordinates E 121158.46 National Grid N 223372.78

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 Semi spongy semi plastic, dark brown pseudo fibrous PEAT.	(0.30)		
0.30-0.60	B 2			0.30 +38.78		
0.30-0.60	B 3		2 Brown slightly silty sandy peaty GRAVEL with occasional cobbles. Locally slightly sandy very gravelly CLAY. Gravel is subangular, fine to coarse. Cobbles are subangular of limestone and granite.	(0.30)		
0.50	D 1			0.60 +38.48		
			EXPLORATORY HOLE ENDS AT 0.60 m			

Depth	Type & No.	Records Date

Groundwater Entries		
No.	Struck (m)	Post Strike Behaviour
None observed (see Key Sheet)		

Depth Related Remarks	
From (m)	to (m)
0.60	Trial pit terminated on obstruction - presumed bedrock.

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 22/03/2004 12:36:58

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP322A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 23/01/2004 End 23/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.80 m Length 1.80 m 92 (Deg)	Ground Level +40.25 mOD Coordinates E 121140.52 National Grid N 223456.56

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.50	D 1		1 Plastic dark brown pseudo fibrous PEAT.			
0.50-1.00	B 2					
0.50-1.00	B 3			(1.70)		
1.00	D 4					
1.00-1.50	B 5		1.10 m Becoming fibrous			
1.00-1.50	B 6					
			EXPLORATORY HOLE ENDS AT 1.70 m	1.70 +38.55		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	0.30	Slight Inflow
2	1.60	Rose to 1.10 m after 30 minutes.

Depth Related Remarks

From	to (m)	
1.70		Trial pit terminated on obstruction - presumed bedrock

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MEStG Hill (286), 22/03/2004 12:37:03

AGS

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP323

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 04/02/2004 End 04/02/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.60 m Length 2.30 m 182 (Deg)	Ground Level +46.29 mOD Coordinates E 121141.46 National Grid N 223655.82

Samples and Tests

Depth	Type & No.	Date Records
0.30-0.50	B 2	
0.30-0.50	B 3	
0.50	D 1	
0.70	D 4	
0.70-0.90	B 5	
0.70-0.90	B 6	

Strata

Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instrument
1 Plastic brown fibrous PEAT.	(0.50)		
2 Firm to stiff grey brown slightly sandy gravelly organic CLAY with occasional cobbles and boulders. Gravel is subangular granite. Cobbles and boulders are of granite.	0.50 +45.79 (0.40)		
EXPLORATORY HOLE ENDS AT 0.90 m	0.90 +45.39		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	0.00	Flow from surface

Depth Related Remarks

From	to (m)	
0.70		Trial pit terminated on obstruction - presumed bedrock

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (236), 23/03/2004 12:09:36

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP324

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 04/02/2004 End 04/02/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 0.55 m Length 2.30 m 45 (Deg)	Ground Level +49.04 mOD Coordinates E 121134.71 National Grid N 223761.31

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 Plastic brown fibrous PEAT.	(0.60)		
0.50	D 1					
0.50-0.60	B 2					
0.50-0.60	B 3		EXPLORATORY HOLE ENDS AT 0.60 m	0.60 +48.44		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike (m)	Behaviour
None observed (see Key Sheet)			

Depth Related Remarks

From	to (m)	
0.50		Trial pit terminated on obstruction - presumed bedrock of granite.

Stability Moderate

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (298), 22/03/2004 12:37:14 AGS

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP325A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 14/01/2004 End 14/01/2004	Equipment, Methods and Remarks Excavated using a JCB	Dimensions and Orientation Width 0.75 m Length 2.50 m 250 (Deg)	Ground Level +28.78 mOD Coordinates E 124085.44 National Grid N 224977.09

Samples and Tests

Depth	Type & No.	Date Records
0.40-0.60	B 2	
0.40-0.60	B 3	
0.60	D 1	
1.00	D 4	
1.00-1.30	B 5	
1.00-1.30	B 6	

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
1 TOPSOIL: Firm to stiff brown slightly organic slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse.	(0.60)		
2 Grey mottled brown clayey very sandy GRAVEL with occasional cobbles. Locally slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse. Cobbles are subangular of granite.	0.60 +28.18 (0.70)		
EXPLORATORY HOLE ENDS AT 1.30 m 1.30 m Bedrock recovered as angular to subangular gravel and subangular cobbles of granite.	1.30 +27.48		

Depth	Type & No.	Records Date

Groundwater Entries

No. Struck	Post Strike Behaviour (m)
None observed (see Key Sheet)	

Depth Related Remarks

From	to (m)	
1.30		Trial pit terminated on obstruction - presumed granite bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESG HBIII (208), 23/03/2004 12:45:29

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP419

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 26/01/2004 End 26/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.00 m Length 3.50 m 186 (Deg)	Ground Level +28.35 mOD Coordinates E 124162.28 National Grid N 224793.69

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
			1 Firm brown slightly sandy slightly gravelly CLAY with occasional cobbles and many plant roots. Gravel is subangular, fine to coarse granite.	(0.30)		
			EXPLORATORY HOLE ENDS AT 0.30 m 0.30 m Presumed GRANITE bedrock, recovered as grey gravel with many cobbles. Gravel is subangular fine to coarse. Cobbles are subangular.	0.30 +28.05		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour

None observed (see Key Sheet)

Depth Related Remarks

From (m)	to (m)	
0.30		Trial pit terminated on obstruction - presumed granite bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (388), 22/03/2004 12:42:24

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP420

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by RCR	Start 27/01/2004 End 27/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.00 m Length 4.10 m 18 (Deg)	Ground Level +23.00 mOD Coordinates E 124421.90 National Grid N 224633.95

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.20-0.40 0.20-0.40	B 2 B 3		1 Firm brown slightly sandy CLAY with occasional cobbles.	(0.40)		
0.40	D 1		2 Slightly silty sandy GRAVEL with occasional cobbles. Gravel is subangular, fine to coarse. Cobbles are subangular of granite. 0.60-0.90 m Mottled dark brown with iron staining	0.40 +22.60 (1.00)		
1.00 1.00-1.40 1.00-1.40	D 4 B 5 B 6		EXPLORATORY HOLE ENDS AT 1.40 m	1.40 +21.60		

Depth	Type & No.	Records Date

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.40	Slight inflow on top of rock.

Depth Related Remarks

From	to (m)	
1.40		Trial pit terminated on obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MESO HBIL (298), 22/03/2004 12:42:29

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP423

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 27/01/2004 End 27/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.20 m Length 3.80 m 110 (Deg)	Ground Level +21.93 mOD Coordinates E 124465.30 National Grid N 224621.04

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.50	D 1		1 Plastic dark brown pseudo fibrous PEAT with occasional wood fragments.	(2.10)		
0.50-1.00	B 2					
0.50-1.00	B 3					
1.50-2.00	B 5					
1.50-2.00	B 6					
2.00	D 4					
			2 Firm to stiff grey slightly sandy gravelly CLAY with many cobbles. Gravel is subangular, fine to coarse granite. Cobbles are subangular granite.	2.10 +19.83		
			EXPLORATORY HOLE ENDS AT 2.20 m	2.20 +19.73		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	2.20	Rose to 1.75 m after 30 minutes.

Depth Related Remarks

From	to (m)	
2.20		Trial pit terminated on obstruction - presumed bedrock.

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

(c) MEGG HBIII (298), 22/03/2004 12:42:34

Project N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva

Project No. KC3267

Carried out for Galway County Council

Trial Pit

TP423A

Sheet 1 of 1

Trial Pit Log

Logged by DB Checked by ROR	Start 27/01/2004 End 27/01/2004	Equipment, Methods and Remarks Excavated using a track machine	Dimensions and Orientation Width 1.00 m Length 4.00 m 32 (Deg)	Ground Level +22.98 mOD Coordinates E 124633.76 National Grid N 224617.34

Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instrument
0.10-0.30 0.10-0.30 0.30	B 2 B 3 D 1		1 Brown organic silty very sandy GRAVEL with occasional roots. Gravel is subangular fine to coarse. 0.00-0.10 m Brown clay with occasional roots	(0.50)		
			3 Firm to stiff grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is subrounded, fine to coarse of granite. Cobbles are subangular of granite.	0.50 +22.48 (0.70)		
1.00 1.00-1.20 1.00-1.20	D 4 B 5 B 6		EXPLORATORY HOLE ENDS AT 1.20 m	1.20 +21.78		
Depth	Type & No.	Records Date				

Groundwater Entries

No.	Struck (m)	Post Strike Behaviour
1	1.20	Slight inflow on top of rock

Depth Related Remarks

From	to (m)	
1.20		Trial pit terminated on obstruction - presumed bedrock

Stability Good

Shoring None

Weather

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25 (c) MESG HBIII (288), 22/03/2004 12:42:40 AGS

Project	N6 Galway City Outer Bypass: Contract 3 Ground Investigation: Forramoyle West to Gortatleva
Project No.	KC3267
Carried out for	Galway County Council

Trial Pit

TP425

Sheet 1 of 1

Appendix A.9.1.1.4

N6 Galway City Outer Bypass
Contract Detailed Design
Ground Investigation –
September to November 2006

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
BH 896	B	0-1.0																			1	Loss on Ignition / Von Post Classification
BH 911A	B	0.5-1.0																			1	Loss on Ignition / Von Post Classification
BH 911A	B	1.5-2.0				1	*0*															
BH 911B	W	1.50																1	1			
BH 911B	B	0.5-1.0				1															1	
BH 915	B	0.5-1.0																1	1		1	Loss on Ignition / Von Post Classification
BH 915	B	3.5-4.0				1	1															Drained SB : 50, 100, 150kPa
BH 915	B	3.5-4.0															1					Drained SB : 50, 100, 150kPa
BH 915	B	4.0-5.0	1	1		1	*0*														*0*	*NOT POSSIBLE*
BH 934	D	1.00	1																			
BH 934	D	3.00	1																			
BH 934	D	5.00	1																			
BH 934	D	0.0-0.5	1																			
BH 934	B	0.5-1.0																			1	Loss on Ignition / Von Post Classification
BH 934	U / B	3.5-3.95		1		1	1											1	1		1	
BH 934A	B	3.5-4.5		1		1	1														1	
BH 939	D	2.00	1																			
BH 939	D	3.00	1																			
BH 939	U	1.5-1.95	1											*0*		1					1	Loss on Ignition X2 Von Post Classification UUTXL : 25kPa *too soft*
BH 939	B	2.5-3.0		1		1	1											1	1			
BH 943a	D	1.00	1																			
BH 943a	D	2.50	1																			
BH 943a	D	7.50	1	1		1	*0*											1	1		1	*Too Organic for Hyd*
BH 943a	D	8.50	1																			
BH 943a	D	11.50															1					Drained SB : 80, 160, 240kPa
BH 943a	P	4.0-5.0	1											*0*		1		1	1		1	Loss on Ignition Von Post Classification UUTXL : 20kPa *too soft*

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
BH 943a	P	6.5-7.5	1																		1	
BH 1003	B	0.0-0.8	1			1												1	1		1	
BH 1014	D	1.00	1																			
BH 1014	D	2.00	1																			
BH 1014	B	1.0-1.5				1																
BH 1024	D	0.50	1																			Von Post Classification
BH 1024B	D	1.00	1																			Von Post Classification
BH 1024B	D	2.00	1																			
BH 1049	D	1.00	1	1		1	1															
BH 1049	D	2.00	1																			
BH 1049	D	0.0-0.5	1																			
BH 1231	D	1.00	1																			
BH 1231	D	2.00	1																			
BH 1231	B	1.0-1.5		1		1																
BH 1234	D	1.00	1																			
BH 1234	D	2.00	1																			
BH 1234	D	3.00	1																			
BH 1234	B	1.0-1.5		1		1																
BH 1278	D	1.00	1																			
BH 1278	B	0.0-1.0		1		1												1	1	1		
BH 1290	D	0.6	1																			
BH 1290	B	0.0-0.6		1		1																
RC936	C	17-18				1	1															
RC936	C	24-25				1	1										1	1	1		1	60X60SB 200, 400, 600kPa
RC936	C	34-35				1	1															
RC936	C	40-41		1	1	1	1						1					1	1		1	Oed : 200,400, 800, 1600, 800, 400
RC936	C	46-47		1	1	1	1										1					60X60SB 250, 500, 750kPa
RC936	C	51-52		1	1	1	1						1					1	1		1	Oed : 200,400, 800, 1600, 800, 400
RC936	C	55.5-56.5		1	1	1	1										1					60X60SB 300, 600, 900kPa
RC936	C	6.0-7.0		1		1	1											1	1		1	
RC937	C	11.0-12.0		1		1	1											1	1		1	
RC937	C	16-17		1		1	1															

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
RC937	C	19-20		1	1	1	1						1					1	1		1	Oed : 200,400, 800, 1600, 800, 400
RC937	C	26-27		1	1	1	1										1					60X60SB 200, 400, 600kPa
RC937	C	32-33		1	1	1	1						1					1	1		1	Oed : 200,400, 800, 1600, 800, 400
RC937	C	36-37		1		1	1														1	
RC937	C	49-50		1	1	1	1										1					60X60SB 300, 600, 900kPa
RC937	C	9.0-10.0				1	1															
RC940	C	10.0-11.0		1		1	1														1	
RC940	C	14-15		1	1	1	1						1					1	1			Oed : 200,400, 800, 1600, 800, 400
RC940	C	19-20		1	1	1	1										1				1	60X60SB 200, 400, 600kPa
TP 502	J	0.0-0.35	1																		1	
TP 503	J	0.0-0.55	1																		1	
TP 506	J	0.0-0.5	1																			
TP 509	J	0.0-0.5	1															1	1			
TP 512	J	1	1															1	1	1	1	
TP 512	J	0.8-1.3	1																			
TP 514	J	0.0-0.2	1																			
TP 516	J	0.0-0.5	1															1	1			
TP 525	J	0.0-0.5	1																			
TP 525	B	0.5-1.4	1																			
TP 525	B	1.4-1.8	1			1															1	
TP 559	J	0.25	1																			
TP 559	B	0.70	1															1	1		1	
TP 559	B	1.5	1																			
TP 560	J	0.3	1																			
TP 560	J	1.00	1															1	1	1	1	
TP 560	J	2.00	1																			
TP 560	J	2.30	1																		1	
TP 577	J	0.3	1																			
TP 577	B	0.80		1		1	*0*														1	*TOO ORGANIC*
TP 577	J	0.8	1																			
TP 588	J	0.50	1																			
TP 588	J	1.5	1																		1	

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
TP 690	J	0.2	1																			
TP 690	J	1.00	1																			
TP 691	J	0.15	1																			
TP 693	B	0.35		*0*						1											1	*too fibrous*
TP 693	J	0.35	1																			
TP 695	J	0.2	1																			
TP 695	B	0.3				1				1												
TP 695	J	0.3	1																			
TP 698	J	1.00	1			1																
TP 698	b	1.6																1	1			
TP 699	B	0.7				1	*0*											1	1		1	
TP 699	J	0.7	1																			
TP 699	J	1.5	1																			
TP 701	J	0.6	1																			
TP 701	B	1.00				1	1															
TP 701	J	1.00	1																			
TP 701	W	1.5																1	1			
TP 709	J	0.5	1																			
TP 709	W	0.5																1	1			
TP 709	B	1.3				1	*0*															
TP 709	J	1.3	1																			
TP 710	B	1.00				1	*0*											1	1		1	
TP 710	J	1.00	1																			
TP 710	J	1.6	1																			
TP 711	J	0.3	1	1																		
TP 713	J	0.15	1																			
TP 714	J	0.2	1	1																		
TP 716	B	0.7																1	1	1	1	Loss on Ignition / Von Post Classification
TP 716	J	0.7	1																			
TP 716	B	1.6				1	*0*														1	
TP 716	J	1.6	1																			
TP 716	J	2.5	1																			
TP 717	B	0.7				1	*0*															
TP 717	J	0.7	1																			
TP 717	J	1.9	1																			
TP 717	W	2.2																1	1			
TP 718	J	0.5	1																			

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule **tp1, bh1, bh2**
Date 11-Oct-06
Scheduled By FV

			Classification					Earthworks					Settlement	Strength				Chemical				
BH/TP No.	Sample Type	Sample Depth	MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	Remarks/Loading
TP 718	J	1.5	1															1	1		1	Loss on Ignition / Von Post Classification
TP 718	B	2.5				1	1															
TP 718	J	2.5	1																			
TP 719	J	0.3	1																			Loss on Ignition / Von Post Classification
TP 719	J	1.6	1			1	*0*															
TP 719	W	1.6																1	1			
TP 719	J	2.5	1																			
TP 720	J	0.5	1																			
TP 720	B	1.2				1	*0*											*0*	*0*		*0*	*too coarse*
TP 720	J	1.2	1																			
TP 721	B	0.5																			1	Loss on Ignition / Von Post Classification
TP 721	J	0.5	1																			
TP 721	B	1.5				1	*0*											*0*	*0*			*too coarse*
TP 721	J	1.5	1																			
TP 721	J	2.2	1																			
TP 722	J	0.8	1			1																
TP 722	J	1.6	1																			
TP 730	J	0.4	1																			
TP 730	B	1.00				1			1													
TP 732	B	1	1																		1	Loss on Ignition / Von Post Classification
TP 732a	J	0.15	1																			
TP 732b	J	0.2	1																			Loss on Ignition / Von Post Classification
TP 732c	J	0.4	1																			
TP 732c	J	1.00	1																			
TP 732c	W	1.25																1	1			
TP 733	J	0.8	1																			
TP 733	B	1.6				1				1												
TP 733	J	1.6	1																			
TP 733b	J	0.5	1																		1	Loss on Ignition / Von Post Classification
TP 733b	J	1.00	1			1																
TP 733c	B	0.4	1			1	*0*			1												
TP 733c	J	0.4		1														1	1	1		
TP 737	B	0.7				1				1												

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule **tp1, bh1, bh2**
Date 11-Oct-06
Scheduled By. FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
TP 870	J	0.5	**1**																		**1**	Loss on Ignition / von Post Classification
TP 870	J	1.5	**1**																			
TP 870	W	2.5																**1**	**1**			
TP 870	B	2.9		**1**		**1**	**1**															
TP 870	J	2.9	**1**															**1**	**1**			
TP 870	J	3.2	**1**																			
TP 876	J	0.4	**1**																			
TP 876	J	1.4	**1**																		**1**	Loss on Ignition / Von Post Classification
TP 876	B	1.9		**1**																	**1**	
TP 876	J	1.9	**1**																			
TP 876	B	2.2				**1**																
TP 887	J	0.5	**1**																			
TP 887	B	1.7		**1**		**1**	**1**															
TP 887	J	1.7	**1**																			
TP 887	J	2.1	**1**																			
TP 894	J	2.5	**1**																			
TP 894	B	3.1		**1**														**1**			**1**	
TP 894	J	3.1	**1**																			
TP 908	B	0.5		1		1	1														1	
TP 908	J	0.5	1																			
TP 908	J	1.5	1																			
TP 909	J	0.5	1																		1	Loss on Ignition
TP 909	J	1.5	1																			
TP 909	B	2.0				1	1											1	1			
TP 909A	B	1.0				1																
TP 913	J	0.5	1																		1	Loss on Ignition
TP 913	B	1.6				1																
TP 922	J	0.5	1																			
TP 922	J	2.5	1																			Loss on Ignition
TP 922	B	2.7		1		1	*0*														1	*TOO ORGANIC*
TP 922	J	2.7	1																			
TP 932	J	1.00	1																			
TP 932	J	2.00	1	1																		
TP 932	B	2.5				1	1											1	1		1	
TP 932	J	3.00	1																			
TP 935	J	0.5	1																			
TP 935	B	1.5		1		1	1											1	1		1	

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
TP 935	J	2.5	1																			
TP 935	B	3.00	1	1																		
TP 935	J	3.4	1																			
TP 941	J	0.2	1																			
TP 941	B	0.5		1		1	*0*															too coarse
TP 941	J	1.00	1	1																		
TP 941	W	1.5																1	1			
TP 941	J	1.6	1																			
TP 941a	J	0.5	1																			
TP 941a	J	2.00	1																		1	Loss on Ignition
TP 941a	B	3.00		1		1	1															
TP 941a	J	3.5	1																			
TP 944	J	0.3	1																			
TP 944	B	0.5		1		1																
TP 944	J	1.00	1																			
TP 945	J	0.3	1																			
TP 945	J	1.00	1																			
TP 945	B	1.4		1		1																
TP 945	J	1.4	1																			
TP 951	J	0.3	1																			
TP 951	B	1.00				1		1				1						*0*	*0*			too coarse
TP 951	J	1.3	1																			
TP 962	J	0.2	1																			
TP 962	B	0.6		1		1																
TP 964	J	0.25	1																			
TP 967	J	0.1	1																			
TP 969	J	0.1	1																			
TP 969	B	0.7		1		1	1											1	1			
TP 969	J	0.7	1																			
TP 971	J	0.3	1																			
TP 971	B	1.0		1		1	1	1				1										
TP 971	J	1.0	1																			
TP 978	B	0.4		1																		
TP 978	J	0.4	1																			
TP 983	J	0.1	1																			
TP 984	J	0.15	1	1																		
TP 992	J	0.2-0.4	1	1																		
TP 996	J	0.20	1																			
TP 996	J	0.80	1																			

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule **tp1, bh1, bh2**
Date 11-Oct-06
Scheduled By FV

			Classification					Earthworks					Settlement	Strength				Chemical				
BH/TP No.	Sample Type	Sample Depth	MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	Remarks/Loading
TP 996	B	1.50		1		1	1											1	1			
TP 996	J	1.50	1																			
TP 997	B	0.50	1	1																		
TP 1055	B	0.6	1	1		1												1	1			
TP 1065	B	0.4	1			1																
TP 1074	B	0.5		1																		
TP 1074	J	0.5	1																			
TP 1079	J	0.15	1																			
TP 1079	B	0.3		1		1	1		1	1	1							1	1			
TP 1079	J	0.3	1																			
TP 1081	J	0.15	1																			
TP 1081	J	0.5	1																			
TP 1085	J	0.15	1																			
TP 1085	B	0.5				1												1	1			
TP 1085	J	0.5	1																			
TP 1086	J	0.15	1																			
TP 1086	B	0.6				1			1	1	1											
TP 1086	J	0.6	1																			
TP 1088	B	0.5				1			1	1	1							1	1			
TP 1091	B	0.4		1		1	1	1					1								1	
TP 1091	J	0.4	1																			
TP 1093	J	0.5	1																			
TP 1093	B	1.5		1		1	1											1	1			
TP 1093	J	1.5	1																			
TP 1093	J	2.5	1																			
TP 1100	J	0.15	1																			
TP 1100	J	0.5	1																			
TP 1100	B	1.00		1		1	*0*														1	*TOO ORGANIC*
TP 1100	J	1.00	1																			
TP 1100	J	2.00	1																			
TP 1111	J	0.15	1																			
TP 1111	B	1.00																1	1		1	
TP 1111	J	1.00	1																			
TP 1111	J	2.00	1	1		1	1											1	1			
TP 1111	J	3.00	1																			
TP 1111	B	4.00		1		1	1															
TP 1111	J	4.00	1																			
TP 1132	B	1.00	1	1		1	1		1	1								1	1			
TP 1134	J	0.05	1	1																		

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule **tp1, bh1, bh2**
Date 11-Oct-06
Scheduled By FV

			Classification					Earthworks					Settlement	Strength				Chemical				
BH/TP No.	Sample Type	Sample Depth	MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	Remarks/Loading
TP 1270	B	0.50		1		1	1	1				1										
TP 1402	J	0.2	1	1																		
TP 1402	J	0.75	1																			
TP 1406	J	0.0-1.0	1																			Loss on Ignition
TP 1406	J	1.0-1.7	1																			
TP 1407	J	0.0-1.0	1																			
TP 1407	J	1.0-2.0	1																			
TP 1407	J	2.0-3.0	1																			Loss on Ignition
TP 1411	B	0.4-1.0		1		1	*0*															
TP 1411	J	0.4-1.0	1																			
TP 1411	B	1.0-1.4		1		1																
TP 1411	J	1.0-1.4	1																			
TP 1412	B	0.5-0.74		1		1	*0*											1	1			too coarse
TP 1412	J	0.5-0.74	1																			
TP 1413	B	0.5-1.2		1		1																
TP 1413	J	0.5-1.2	1																			
TP 1416	J	0.7-0.8	1																			Loss on Ignition
TP 1417	B	1.0-1.85				1																
TP 1417	J	1.0-1.85	1																			
TP 1417	B	1.85-2.1				1																
TP 1417	J	1.85-2.1	1																			
TP 1419	J	0-0.5	1																			
TP 1422	B	1.6-2.1				1																
TP 1423	B	0.9-1.3				1																
TP 1424	B	0.5-1.0				1																
TP 1427	B	0.7-1.0				1																
TP 1428	B	0.5-1.0		1																		
TP 1428	B	1.1-1.6		1		1	1															
TP 1428	J	1.1-1.6	1																			
TP 1428	J	1.9-2.3	1																			
TP 1430	J	0.5-1.0	1																			
TP 1430	B	1.3-1.5	1			1																
TP 1431	J	0.5-1.0	1																			
TP 1431	B	1.0-1.5				1																
TP 1432	B	1.0-1.1				1																
TP 1435	J	1	1																		1	Loss on Ignition
TP 1436	B	0.48-1.0		1		1	1															
TP 1436	J	0.48-1.0	1																			
TP 1436	B	1.0-2.1		1																		

CONTRACT: **GCOB**
Client Galway County Council
Engineer Ryan Hanley WSP

Schedule: **tp1, bh1, bh2**
Date: 11-Oct-06
Scheduled By: FV

BH/TP No.	Sample Type	Sample Depth	Classification					Earthworks					Settlement	Strength				Chemical				Remarks/Loading
			MC (%)	Atterberg Limits	Bulk Density	PSD	Hydro	5-point MCV	CBR 1 point	MCV 1 Point	5 Point Comp only	5 Point Comp with CBR	Consol (Oed)	Triaxial (Q-U)	Triaxial (Con-U)	Lab Vane	Shear Box	SO3 (total acid sol)	pH	Chloride	Organic Content	
TP 1436	J	1.0-2.1	1																			
TP 1439	J	0.7	1																			
TP 1439	J	1.7	1																			
TP 1439	J	2.5	1																			
TP 1439	J	3.1	1																			
TP 1440	J	0.1	1																			
TP 1440	B	0.7		1		1	1															
TP 1440	J	0.7	1																			
TP 1441	J	0.2	1																			
TP 1441	J	0.8	1	1		1	1															
TP 1441	J	1.7	1																			
TP 1442	J	0.2	1																			
TP 1442	B	0.5		1																		
TP 1442	J	0.5	1																			
TP 1443	J	0.2	1																			
TP 1443	J	0.5	1	1		1	*0*															
TP 1443	J	1.2	1																			
TP 1444	J	0.15	1																			
TP 1444	J	0.45	1	1																		
TP 1444	J	1.3	1																			
TP 1445	J	0.2	1																			
TP 1445	B	0.8		1		1	1															
TP 1445	J	0.8	1																			
TP 1446	J	0.1	1																			
TP 1446	B	0.45		1																		
TP 1446	B	1.3	1																			
TP 1447	J	0.3	1																			
TP 1447	B	1.00	1	1		1	*0*														1	
TP 1447	B	2.85		1																		
TP 1452	B	1.0-2.0				1																
TP 1453	J	0.3	1																			
TP 1456	B	0.5		1																		
TP 1456	J	0.8	1																			
TP 1458	B	0.5	1	1																		
TP 1460	B	1.6		1		1	1															
TP 1461	J	0.5	1																			
TP 1461	B	1	1																			

CONTRACT: N6 GCOB
Client Galway County Council
Engineer Ryan Hanley WSP / JBA

Schedule RC1
Date 17-Oct-06
Schedule MK

BH/TP No.	Sample Depth (Top)	Sample Depth (Bottom)	Sample Type	MC (%)	H8.8 Point Load	H8.7 UCS	H8.1 Porosity / Density	H8.2 Slake Durability	H8.3 Magnesium Soundness	H8.4 10% Fines Value	H8.5 Aggregate Abrasion	H8.6 Polished Stone Value	H8.9 Aggregate Crushing	H8.10 Sulphate Content	H8.11 Chloride Content	H2.6 pH	H2.7/H2.8 Resistivity & Redox	H8.12 Thin Sect Petro	H8.14 Water Absorption	Remarks/Loading
MW 01	0.5	1.4	C																	
MW 01	1.4	2.9	C																	
MW 01	2.9	4.4	C																	
MW 01	4.4	6	C																	
MW 01	6.0	7.6	C																	
MW 01	7.6	9.2	C																	
MW 01	9.20	10.80	C																	
MW 01	10.80	12.20	C																	
MW 01	12.20	13.80	C																	
MW 02	3.80	4.60	C																	
MW 02	4.60	5.60	C																	
MW 02	5.60	6.00	C																	
MW 02	6.00	7.60	C																	
MW 02	7.60	9.20	C																	
MW 02	9.20	10.80	C																	
MW 02	10.80	12.30	C																	
MW 02	12.30	13.80	C																	
MW 02	13.80	15.20	C																	
MW 03	0.50	1.10	C																	
MW 03	1.10	2.60	C																	
MW 03	2.60	3.90	C																	
MW 03	3.90	5.00	C																	
MW 03	5.00	6.10	C																	
MW 03	6.10	8.30	C																	
MW 03	8.30	9.10	C																	
MW 03	9.10	10.70	C																	
MW 03	10.70	12.10	C																	
RC 0510	1.00	1.80	C		1															
RC 0510	1.80	3.30	C							1										
RC 0510	1.80	3.30	C			1														
RC 0510	3.30	4.70	C		1															
RC 0510	4.70	6.20	C																	
RC 0510	6.20	7.80	C																	
RC 0510	7.80	9.00	C																	
RC 0511	2.5	3.3	C		1	1														
RC 0513	0.30	1.30	C		1															
RC 0513	1.30	1.80	C		1															
RC 0513	1.80	3.40	C																	
RC 0513	3.40	5.00	C																	
RC 0515	2.00	3.00	C		1															
RC 0515	3.00	4.10	C		1															
RC 0515	4.10	5.00	C																	
RC 0548	3.00	4.50	C		1	1														
RC 0548	4.50	6.00	C																	
RC 0548	6.00	7.60	C																	
RC 0548	7.60	8.00	C																	
RC 0595	1.00	2.00	C		1															
RC 0595	2.00	3.60	C		1															
RC 0595	3.60	5.20	C																	
RC 0595	5.20	6.80	C																	
RC 0595	6.80	8.00	C																	
RC 0638	1.9	3	C		1															
RC 0638	3.0	3.9	C		1	1														
RC 0640	1.90	3.00	C		1	1														
RC 0640	3.00	4.60	C		1															
RC 0640	4.60	6.00	C		1															
RC 0668	0.00	1.30	C		1															
RC 0668	1.30	2.90	C		1															
RC 0668	2.90	4.50	C																	
RC 0668	4.50	6.00	C																	
RC 0671	1.80	3.40	C		*0*															
RC 0671	3.40	4.50	C																	
RC 0671	4.50	6.00	C																	
RC 0671	6.00	6.80	C																	
RC 0687	1.50	3.00	C		1															
RC 0687	3.00	4.60	C			1														
RC 0687	4.60	6.00	C		1															
RC 0687	6.00	7.60	C																	
RC 0687	7.60	9.00	C																	
RC 0687	9.00	10.60	C																	
RC 0687	10.60	11.00	C																	
RC 0689	2.80	3.80	C		*0*															
RC 0689	3.80	4.60	C		*0*															
RC 0689	4.60	5.80	C			1														
RC 0689	5.80	7.20	C		1															
RC 0689	7.20	8.80	C		1															

CONTRACT: N6 GCOB
Client Galway County Council
Engineer Ryan Hanley WSP / JBA

Schedule RC1
Date 17-Oct-06
Schedule MK

BH/TP No.	Sample Depth (Top)	Sample Depth (Bottom)	Sample Type	MC (%)	H8.8 Point Load	H8.7 UCS	H8.1 Porosity / Density	H8.2 Slake Durability	H8.3 Magnesium Soundness	H8.4 10% Fines Value	H8.5 Aggregate Abrasion	H8.6 Polished Stone Value	H8.9 Aggregate Crushing	H8.10 Sulphate Content	H8.11 Chloride Content	H2.6 pH	H2.7/H2.8 Resistivity & Redox	H8.12 Thin Sect Petro	H8.14 Water Absorption	Remarks/Loading
RC 0903	4.6	6.2	C		1															
RC 0903	6.2	7.5	C																	
RC 0903	7.5	9	C																	
RC 0910	4.30	5.60	C		1															
RC 0910	5.60	7.10	C			1														
RC 0910	7.10	8.60	C		1															
RC 0910	8.60	10.10	C			1														
RC 0912	11.20	11.70	C		1															
RC 0912	11.70	13.30	C			1														
RC 0912	13.30	15.00	C			1														
RC 0912	15.00	16.50	C		1															
RC 0912	16.50	18.00	C		1															
RC 0912	18.00	19.50	C																	
RC 0914	5.1	6	C			1														
RC 0914	6.0	7.5	C		1															
RC 0914	7.5	9	C			1														
RC 0914	9.0	10.5	C		1															
RC 0914	10.5	1.9	C		1															
RC 0916	8.3	9	C		1															
RC 0916	9	10.5	C			1														
RC 0916	10.5	11	C		0															
RC 0916	11	11.5	C		1															
RC 0916	11.5	12	C		1															
RC 0916	12	13.5	C			1														
RC 0916	13.5	15	C		1															
RC 0916	15	16.5	C																	
RC 0916	16.5	18	C																	
RC 0920	0.00	21.90	OB																	
RC 0920	21.90	22.50	C		0															
RC 0920	22.50	24.00	C		1															
RC 0920	24.00	25.40	C		0															
RC 0920	25.40	26.50	C		0															
RC 0920	26.50	27.00	C																	
RC 0920	27.00	28.30	C			0														
RC 0920	28.30	30.00	C		0															
RC 0920	30.00	31.50	C		0															
RC 0920	31.50	33.00	C																	
RC 0920	33.00	34.50	C		0															
RC 0920	34.50	35.50	C																	
RC 0920	35.50	37.00	C		0	0														
RC 0920	37.00	38.50	C																	
RC 0920	38.50	39.50	C		1															
RC 0920	39.50	41.00	C																	
RC 0920	41.00	42.50	C																	
RC 0920	42.50	44.00	C																	
RC 0920A	0	18	OB																	
RC 0920A	18	19.5	C		1															
RC 0920A	19.5	20	C																	
RC 0920A	20	21	C		1															
RC 0920A	21	22.5	C																	
RC 0920A	22.5	23.8	C		1															
RC 0920A	23.8	25.7	C																	
RC 0920A	25.7	27	C		1															
RC 0920A	27	28.8	C																	
RC 0920A	28.8	30	C		0															
RC 0920A	30	31.5	C																	
RC 0920A	31.5	33	C		1															
RC 0920A	33	34	C																	
RC 0920A	34	35	C		1															
RC 0920A	35	36	C																	
RC 0920A	36	37.5	C		1															
RC 0920A	37.5	39	C																	
RC 0920A	39	40.5	C		1															
RC 0920A	40.5	42	C																	
RC 0921	0.00	19.70	OB																	
RC 0921	19.70	20.30	C		0															
RC 0921	20.30	20.80	C		0															
RC 0921	20.80	21.80	C			0														
RC 0921	21.80	22.80	C		0															
RC 0921	22.80	23.80	C		0															
RC 0921	23.80	25.30	C		1															
RC 0921	25.30	26.80	C		1															
RC 0921	26.80	28.30	C		1															
RC 0921	28.30	29.80	C																	
RC 0921	29.80	31.30	C		1															

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BH/TP No.	Sample Depth (Top)	Sample Depth (Bottom)	Sample Type	MC (%)	H8.8 Point Load	H8.7 UCS	H8.1 Porosity / Density	H8.2 Slake Durability	H8.3 Magnesium Soundness	H8.4 10% Fines Value	H8.5 Aggregate Abrasion	H8.6 Polished Stone Value	H8.9 Aggregate Crushing	H8.10 Sulphate Content	H8.11 Chloride Content	H2.6 pH	H2.7/H2.8 Resistivity & Redox	H8.12 Thin Sect Petro	H8.14 Water Absorption	Remarks/Loading
RC 0921	31.30	32.80	C																	
RC 0924	1.7	2.7	C																	
RC 0924	2.7	4.2	C		1	1														
RC 0924	4.2	5.6	C																	
RC 0924	5.6	7	C		1	1														
RC 0924	7.0	8.5	C																	
RC 0924	8.50	10.00	C		1															
RC 0925	1.00	2.30	C																	
RC 0925	2.30	3.60	C		1															
RC 0925	3.60	4.60	C																	
RC 0925	4.60	5.60	C		1	1														
RC 0925	5.60	7.10	C																	
RC 0925	7.10	8.60	C		1															
RC 0925	8.60	10.00	C																	
RC 0926	1.00	1.40	C																	
RC 0926	1.40	2.70	C																	
RC 0926	2.70	3.80	C		1															
RC 0926	3.80	4.60	C																	
RC 0926	4.60	5.60	C		1	1														
RC 0926	5.60	7.00	C																	
RC 0926	7.00	8.50	C		1															
RC 0926	8.50	10.00	C																	
RC 0933	3.00	12.00			1															
RC 0936	3.60	56.70	Refer Schedule RC2A																	
RC 0936	56.70	58.10	C																	
RC 0936	58.10	59.00	C																	
RC 0936	59.00	60.00	C		1															
RC 0936	60.00	61.50	C																	
RC 0936	61.50	63.00	C																	
RC 0936	63.00	64.50	C		1															
RC 0936	64.50	66.00	C																	
RC 0936	66.00	67.50	C																	
RC 0936	67.50	69.00	C																	
RC 0936	C	17-18			leave aside for Soil testing					Done DCD										
RC 0936	C	24-25			leave aside for Soil testing															
RC 0936	C	34-35			leave aside for Soil testing															
RC 0936	C	40-41			leave aside for Soil testing															
RC 0936	C	46-47			leave aside for Soil testing															
RC 0936	C	51-52			leave aside for Soil testing															
RC 0936	C	55.5-56.5			leave aside for Soil testing															
RC 0936	C	6.0-7.0			leave aside for Soil testing															
RC 0937	6.00	77.50	Refer Schedule RC2A																	
RC 0937	77.50	78.00	C																	
RC 0937	78.00	79.50	C		1															
RC 0937	79.50	81.00	C																	
RC 0937	81.00	82.50	C																	
RC 0937	82.50	84.00	C		1															
RC 0937	84.00	85.50	C																	
RC 0937	85.50	87.00	C																	
RC 0937	C	11.0-12.0			leave aside for Soil testing															
RC 0937	C	16-17			leave aside for Soil testing															
RC 0937	C	19-20			leave aside for Soil testing															
RC 0937	C	26-27			leave aside for Soil testing															
RC 0937	C	32-33			leave aside for Soil testing															
RC 0937	C	36-37			leave aside for Soil testing															
RC 0937	C	49-50			leave aside for Soil testing															
RC 0937	C	9.0-10.0			leave aside for Soil testing															
RC 0940	6.00	21.70																		
RC 0940	21.70	22.50	C		1	1														
RC 0940	22.50	24.00	C																	
RC 0940	24.00	25.50	C		1															
RC 0940	C	10.0-11.0			leave aside for Soil testing															
RC 0940	C	14-15			leave aside for Soil testing															
RC 0940	C	19-20			leave aside for Soil testing															
RC 0942	3.50	4.70																		
RC 0942	4.70	6.00	C		1															
RC 0942	6.00	7.50	C																	
RC 0942	7.50	9.00	C		1	1														
RC 0942	9.00	10.50	C																	
RC 0942	10.50	12.00	C																	
RC 0942	12.00	13.50	C		1															
RC 0942	13.50	15.00	C			1														
RC 0942	15.00	16.50	C																	
RC 0942	16.50	18.00	C		1															
RC 0942	18.00	19.50	C																	
RC 0942	19.50	20.00	C																	

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RC 0950	1.4	2.9	C		1															
RC 0950	2.9	4.5	C			1														
RC 0950	4.5	5.8	C		1															
RC 0950	5.8	7.5	C																	
RC 0950	7.5	9.2	C																	
RC 0950	9.2	10.8	C																	
RC 0950	10.8	13	C																	
RC 0952	1.4	3.2	C		1	1														
RC 0952	3.2	4.8	C		1															
RC 0952	4.8	6.2	C																	
RC 0952	6.2	7.7	C																	
RC 0952	7.7	9.2	C																	
RC 0952	9.2	11	C																	
RC 0954	2.2	3.3	C		1															
RC 0954	3.3	4	C		1	1														
RC 0954	4	5.6	C																	
RC 0954	5.6	7.2	C																	
RC 0954	7.2	8.8	C																	
RC 0954	8.8	10	C																	
RC 0959	1.60	3.20	C		1															
RC 0959	3.20	4.60	C		1															
RC 0959	4.60	5.90	C		1															
RC 0959	5.90	7.40	C		1	1														
RC 0959	7.40	9.00	C		1															
RC 0959	9.00	10.60	C		1															
RC 0959A	5.3	6.5	C		0															
RC 0959A	6.5	8	C		1															
RC 0961	0.6	1.2	C		1															
RC 0961	1.2	2.5	C		1															
RC 0961	2.5	3.7	C																	
RC 0961	3.7	4.7	C																	
RC 0961	4.7	6.3	C																	
RC 0961	6.3	7.7	C																	
RC 0961	7.7	9.3	C																	
RC 0961	9.3	10	C																	
RC 0968	0	1.5	C		1															
RC 0968	1.5	2	C		1															
RC 0968	2	3	C			1														
RC 0968	3	5	C																	
RC 0970	1.4	2	C		0															
RC 0970	2	3.5	C			1														
RC 0970	3.5	5	C		1															
RC 0970	5	6.5	C																	
RC 0970	6.5	8	C																	
RC 0970	8	9	C																	
RC 0972	0.50	1.90																		
RC 0972	1.90	2.20	C							1										
RC 0972	2.20	2.80	C																	
RC 0972	2.80	3.80	C		1	1														
RC 0972	3.80	5.00	C																	
RC 0972	5.00	5.80	C		1															
RC 0972	5.80	7.40	C																	
RC 0973	0.50	3.10																		
RC 0973	3.10	3.30	C		0															
RC 0973	3.30	4.50	C			1														
RC 0973	4.50	5.50	C		1															
RC 0973	5.50	7.10	C																	
RC 0977	2.60	4.20	C		1															
RC 0977	4.20	5.80	C		1															
RC 0979	1.40	2.00	C		1															
RC 0979	2.00	2.70	C		1															
RC 0981	1.20	2.00	C		1															
RC 0981	3.2	4.5	C		1															
RC 0982	1.2	2.8	C		1															
RC 0982	2.8	4.1	C		1															
RC 0985	0.8	1.4	C		0															
RC 0985	1.4	2.9	C		1															
RC 0985	2.9	4.2	C																	
RC 0985	4.2	5	C																	
RC 0986	0.4	1.5	C		0															
RC 0986	1.5	3.1	C			1														
RC 0986	3.1	4.7	C		1															
RC 0986	4.7	6.1	C		1															
RC 0986	6.1	7.7	C																	
RC 0986	7.7	8.5	C																	
RC 0988	0	1.6	C											1	1	1	0	1	1	

IRISH DRILLING LTD.
Loughrea Co. Galway.

Tel: (091)841274 Fax: (091) 847687

Contract: Galway City Outer Bypass
Client: NRA
Engineer: John Barnett & Associates

Date: 25/10/2006
Tested By: DD Checked: DJ

Summary of Soil Classification Tests

BS1377: Part 2: 1990

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve
BH 0824		0.5-1.0		30		59	49	10	26		Silt - High Plasticity
BH 0826		0.0-0.5		17.3		56	42	14	29		Silt - High Plasticity
BH 0826		1.5-2.0		12.2		32	18	13	35		Clay - Low Plasticity
BH 0826 A		0.5-1.0		24.8							
BH 0826 A		2.5-3.0		8.9		24	17	7	45		Clay - Low Plasticity
BH 0829 A		0.5-1.0		9.7							
BH 0829 A		1.5-2.0		9.2		25	16	9	57		Clay - Low Plasticity
BH 0829 A		2.5-3.0		7.6							
BH 0829 A		4.5-5.0		7.2		22	15	8	51		Clay - Low Plasticity
BH 0829 B		0.5-1.0		14.4		64	52	12	22		Silt - High Plasticity
BH 0831		0.5-1.0		14.1		35	26	9	36		Silt - Intermediate Plasticity
BH 0831		1.5-2.0		9.5							
BH 0831		2.5-3.0		9.5		19	14	5	33		Silt - Low Plasticity
BH 0832		0.5-1.0		13							
BH 0832		1.5-2.0		12.5		23	16	7	49		Clay - Low Plasticity
BH 0832		2.5-3.0		13.6							
BH 0832		4.5-5.0		11.9							
BH 0832		5.5-6.0		14.4							
BH 0832		6.5-7.0		12.4							
BH 0841		1.0-1.5		17.4		25	18	7	69		Clay - Low Plasticity
BH 0841		2.0-2.5		12.6							
BH 0864 A		2.5-3.5		136.7		124	82	42	70		Organic Silt - Extremely High Plasticity
BH 0864 A		4.5-5.0		51.4							
BH 0888		3.5-4.5		186		147	96	51	62		Organic Silt - Extremely High Plasticity
BH 0888		5.5-6.0		14.5					17		
BH 0911 A		1.5-2.0		5.2							
BH 0911 B		0.5-1.0		57.8							
BH 0915		3.5-4.0		7.3							
BH 0915		4.5-5.0		2			NON PLASTIC		18		NON PLASTIC
BH 0934		1		297.5							
BH 0934		3		217.4							
BH 0934		5.0		134.8							
BH 0934		0.0-0.5		254.7							
BH 0934		3.5-4.0		131.9		129.8	84.8	45			Organic Silt - Extremely High Plasticity
BH 0934 A		3.5-4.0		119.9		86	53.1	32.9			Silt - Very High Plasticity
BH 0939		2.0		229.9							
BH 0939		3.0		350.8							
BH 0939		2.5-3.0		92.5		101	66	35			Silt - Extremely High Plasticity
BH 0943 A		1.0		510.5							
BH 0943 A		2.5		730.2							
BH 0943 A		8.5		71.1							
BH 0943 A		6.5-7.5		356		286	243	43	83		Organic Silt - Extremely High Plasticity
BH 0943 A		11.5		15.4							
BH 1003		0.0-0.8		16.3							
BH 1049		1.0		14.7		47	37	10			Silt - Intermediate Plasticity
BH 1049		2.0		19.1							
BH 1049		0.0-0.5		218.9							

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve
BH 1149		1.0-1.5		40.8		52	31	22	84		Silt - High Plasticity
BH 1174		0.0-1.0		337.2							
BH 1174		2.0-2.5		11.5		27	17	11	41		Clay - Low Plasticity
BH 1174		3.0-3.5		7.8							
BH 1175 A		1.0-1.5		22.5		33	21	12	72		Clay - Low Plasticity
BH 1177		1.0-1.5		51.4							
BH 1182		0.0-1.0		503.8							
BH 1182		1.0-1.5		351							
BH 1182		2.0-2.5		115.6							
BH 1182		3.0-3.5		13.8		22	15	7	72		Clay - Low Plasticity
BH 1188		1.0-1.5		128.8		134	96	38	81		Silt - Extremely High Plasticity
BH 1189		0.0-1.0		74.4							
BH 1189		1.0-1.5		26.7		44	28	16	81		Silt - Intermediate Plasticity
BH 1231		1.0		24.1							
BH 1231		2.0		16.1							
BH 1231		1.0-1.5		15.2		36	27	9	33		Silt - Intermediate Plasticity
BH 1234		1.0		23.7							
BH 1234		2.0		9.5							
BH 1234		3.0		10.3							
BH 1234		1.0-1.5		12.5		22	14	8	60		Clay - Low Plasticity
BH 1235		1.0-1.3				58	42	16			Silt - High Plasticity
BH 1235		1.3-1.5		9.4		23	15	7	58		Clay - Low Plasticity
BH 1235		3.0-3.5		10.1							
BH 1235		5.0-5.5		11.2		20	16	4	37		Silt - Low Plasticity
BH 1248		0.0-1.0		15.2							
BH 1248		1.0-1.5		11.6		24	15	9	67		Clay - Low Plasticity
BH 1248		2.0-2.5		11.1							
BH 1278		1.0		35		51	ION PLASTIC		77		NON PLASTIC
BH 1290		0.6		29.7		49	37	12	58		Silt - Intermediate Plasticity
TP 0502		0.1		26.3							
TP 0503		0.2		27.2							
TP 0506		0.3		45							
TP 0506		0.3		45.9							
TP 0509		0.2		195.1							
TP 0512		1.0		26.3							
TP 0514		0.1		52.9							
TP 0516		0.2		154.4							
TP 0525		0.3		819.5							
TP 0525		1.0		974.8							
TP 0525		1.5		37.9							
TP 0557		0.3		757.9							
TP 0557		0.8		745		760	572	188	76		Silt - Extremely High Plasticity
TP 0559		0.3		436.9							
TP 0559		0.7		923.6							
TP 0559		1.5		811.5							
TP 0560		0.3		628.9							
TP 0560		1.0		886.4							
TP 0560		2.0		1089.1							
TP 0560		2.3		170.4							
TP 0588		0.5		806.7							
TP 0588		1.5		1075.7							
TP 0600		0.2		543.2							
TP 0600		1.0		882		556	368	188	68		Organic Silt - Extremely High Plasticity
TP 0611		0.2		749.7							
TP 0611		0.8		844		910	744	166	77		Organic Silt - Extremely High Plasticity

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve.
TP 0619		1.6		15							
TP 0620		0.2		589.4							
TP 0629		0.3		699							
TP 0629		1.0		1095		928	672	256	43		Organic Silt - Extremely High Plasticity
TP 0639		0.5		709.8							
TP 0639		1.2		1283		NON PLASTIC			39		NON PLASTIC
TP 0657		0.2		488.6							
TP 0657		0.9		690.7							
TP 0658		0.2		575.2							
TP 0658		0.6		323.3							
TP 0669		0.2		1357.6							
TP 0669		0.8		1175.8							
TP 0669		1.8		748.3							
TP 0669		2.2		40							
TP 0669		3.2		9.5							
TP 0670		0.2		226.6							
TP 0674		0.5		113.9							
TP 0684		0.2		613.8							
TP 0684		0.9		485.1							
TP 0684		1.9		351.5							
TP 0684		2.8		186.6							
TP 0685		0.2		599.4							
TP 0685		0.7		670.1							
TP 0685		1.5		385.5							
TP 0686		0.2		585.6							
TP 0686		0.9		617.8							
TP 0686		1.9		437.6							
TP 0688		0.2		219.1							
TP 0690		0.2		357.1							
TP 0690		1.0		257.6							
TP 0691		0.2		268.3							
TP 0693		0.35		233					33		
TP 0695		0.3		29.1							
TP 0698		1		14.2							
TP 0699		0.7		14.6							
TP 0699		1.5		11							
TP 0701		0.6		13.1							
TP 0701		1		10.8							
TP 0709		0.5		12.3							
TP 0709		1.3		5.7							
TP 0710		1		19.4							
TP 0710		1.6		11.4							
TP 0711		0.3		22.8		71	51.3	19.7			Silt - Very High Plasticity
TP 0713		0.15		30.6							
TP 0714		0.2		20.1		75	60	15			Silt - Very High Plasticity
TP 0716		0.7		88.1							
TP 0716		1.6		17.1							
TP 0716		2.5		9.9							
TP 0717		0.7		15.9							
TP 0717		1.9		13.3							
TP 0718		0.5		68.1							
TP 0718		1.5		116.8							
TP 0718		2.5		59.8							

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve
TP 0719		0.3		379.8							
TP 0719		1.6		10.2							
TP 0719		2.5		5.9							
TP 0720		0.5		351							
TP 0720		1.2		20.1							
TP 0721		0.5		392.5							
TP 0721		1.5		24.3							
TP 0721		2.2		25							
TP 0722		0.8		11.3							
TP 0722		1.6		6							
TP 0732		1		525.4							
TP 0732 A		0.15		37.1							
TP 0732 B		0.2		45.9							
TP 0732 C		0.4		10.9							
TP 0732 C		1		56.3							
TP 0733		0.8		447.3							
TP 0733		1.6		167							
TP 0733 B		0.5		242							
TP 0733 B		1		23							
TP 0733 C		0.4		37.2		166	120	46	24		Organic Silt - Extremely High Plasticity
TP 0737		0.7		11.8							
TP 0740		0.5		683.8							
TP 0740		1.9		11.5					60		
TP 0754 A		0.5		595.2							
TP 0754 A		2.3		17.9							
TP 0754 B		0.5		10.3							
TP 0754 B		0.5		11.5							
TP 0754 C		0.5		357.3							
TP 0754 D		0.2		40.2							
TP 0754 D		1.5		220					59		
TP 0760		0.4		26.2							
TP 0789		0.6		20.2							
TP 0795		1.1		790.4							
TP 0796		0.5		766.1							
TP 0796		1.6		924.4							
TP 0798		0.6		9.7							
TP 0798		1.6		14.9							
TP 0801		0.5		2							
TP 0802		0.4				66	NON PLASTIC				NON PLASTIC
TP 0803		2		9							
TP 0807		0.7		14.4							
TP 0807		1.7		9.3							
TP 0810		0.5		13.3							
TP 0812		0.1		21.6							
TP 0816		0.5		15.6							
TP 0820		0.5		23.8							
TP 0823		0.5		17.9							
TP 0823		1.5		27.9		20	16	4	48		Silt - Low Plasticity

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve
TP 0825		0.5		13.5							
TP 0825		1.5		10.7		20	13	7	50		Clay - Low Plasticity
TP 0825		2.5		8.8							
TP 0833		1.3		12.6							
TP 0834		0.6		11.2		20	14	6	63		Clay - Low Plasticity
TP 0834		1.6		11.5							
TP 0837		0.8		13.7							
TP 0837		1.8		10.6		40	30	11	36		Silt - Intermediate Plasticity
TP 0838		0.5		14.1		22	14	8	65		Clay - Low Plasticity
TP 0838		2.3		10.2							
TP 0840		1.7		10.5		20	16	4	61		Silt - Low Plasticity
TP 0857		0.5		452.9							
TP 0857		1.2		131.8		136	91	45	66		Organic Silt - Extremely High Plasticity
TP 0870		0.5		471.8							
TP 0870		1.5		103.4							
TP 0870		2.9		139.4		134	83	51	37		Organic Silt - Extremely High Plasticity
TP 0870		3.2		58.9							
TP 0876		0.4		436.6							
TP 0876		1.4		498.4							
TP 0876		1.9		136.3		117	80	37	99		Silt - Extremely High Plasticity
TP 0876		1.9		91							
TP 0876		2.2		7.1							
TP 0887		0.5		764.3							
TP 0887		1.7		67.6		137	86	51	67		Organic Silt - Extremely High Plasticity
TP 0887		2.1		36.3							
TP 0894		2.5		817.7							
TP 0894		3.1		142		173	108	65	96		Organic Silt - Extremely High Plasticity
TP 0895		1.0-1.5		11.6		23	15	8	57		Clay - Low Plasticity
TP 0895		2.0-2.5		264.5							
TP 0897		0.2-0.8		18		30	20	10	54		Clay - Low Plasticity
TP 0897		1.5-2.0		215.9							
TP 0897		2.0-2.5		14							
TP 0899		1.2		7.6							
TP 0899		0.1-1.0		24.6		46	24	22	71		Clay - Intermediate plasticity
TP 0901		0.1-0.5		18.2		53	31	22	51		Silt - High Plasticity
TP 0901		0.5-0.6		204							
TP 0901		1.0-1.3		2.9							
TP 0902		0.5		75.1							
TP 0902		0.5-0.8		5.9		17	10	7	51		Clay - Low Plasticity
TP 0902		0.8-1.0		23.9							
TP 0902		2.0-2.3		10.9							
TP 0904		1.0-1.5		7.3							
TP 0904		3.0-3.5		8.9							
TP 0905		1.0-1.5		16.3		31	19	12	56		Clay - Low Plasticity
TP 0906		1.0-1.2		424.6							
TP 0906		2.1-2.3		112		119	76	43	78		Silt - Extremely High Plasticity
TP 0906		3.5-3.7		44.4							
TP 0907		0.4-0.6		8							
TP 0907		1.0-1.2		418.7							
TP 0907		2.5-2.9		113		127	110	17	76		Organic Silt - Extremely High Plasticity
TP 0908		0.5		9.9		17	12	5	67		Silt - Low Plasticity
TP 0908		1.5		9.2							
TP 0909		0.5		442							
TP 0909		1.5		571.5							
TP 0909		2		16.6							
TP 0909 A		1		37.7							
TP 0913		0.5		401.2							
TP 0913		1.6		8.5							

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve.
TP 0922		2.5		296							
TP 0922		2.7		686		239	215	24	56		Organic Silt - Extremely High Plasticity
TP 0922		0.2-0.4		763.4			32				
TP 0932		1		482.2							
TP 0932		3		105.2							
TP 0932		2.0-2.5		138.8		140	75	65	61		Organic Silt - Extremely High Plasticity
TP 0935		0.5		1031.5							
TP 0935		1.5		225		177	128	49	54		Organic Silt - Extremely High Plasticity
TP 0935		2.5		235.6							
TP 0935		3.0		118.2		111	49	61	74		Organic Silt - Extremely High Plasticity
TP 0935		3.4		189							
TP 0941		0.2		72.5							
TP 0941		0.3		16.9							
TP 0941		0.5		32.2		57	39	18	41		Silt - High Plasticity
TP 0941		1		15.2							
TP 0941		1.5		13							
TP 0941 A		0.5		830.8							
TP 0941 A		2		757.6							
TP 0941 A		3.0-3.5		262		320	228	92	57		Organic Silt - Extremely High Plasticity
TP 0944		0.3		28.9							
TP 0944		0.5		14.4		36	16	20	31		Clay - Intermediate Plasticity.
TP 0944		1		11.1							
TP 0945		0.3		8.8							
TP 0945		1		14.3							
TP 0945		1.4		30.5			88		20		
TP 0951		0.3		17							
TP 0951		1.0		9.9							
TP 0951		1.3		8.6							
TP 0953		0.1		27.1							
TP 0962		0.2		29.7							
TP 0962		0.6		10.6		30	21	9	52		Clay - Low Plasticity
TP 0964		0.25		36.7							
TP 0969		0.1		183.1							
TP 0969		0.7		24.2		42	22	19	83		Clay - Intermediate Plasticity.
TP 0971		1		10.3		24	17	7	56		Clay - Low Plasticity
TP 0983		0.1		56.5							
TP 0984		0.15		255			66		40		
TP 0992		0.2-0.4		18.1					26		
TP 0997		0.2-0.5		27.7		49	30	19	69		Silt - Intermediate Plasticity
TP 1013		0.5-1.0		10.3		32	19	13	56		Clay - Low Plasticity
TP 1013		2.5-3.0		7.3							
TP 1023		1.0-1.5		232							
TP 1023		2.0-2.5		20.2							
TP 1042		1.0-1.5		15.5		32	18	14	86		Clay - Low Plasticity
TP 1046		1.0-1.5		12.2							
TP 1052		0.3-0.6		287.9							
TP 1052		0.6-1.0		15		32	20	12	48		Clay - Low Plasticity
TP 1055		0.6		15.6		32	19	14	98		Clay - Low Plasticity
TP 1065		0.4		28.2							
TP 1068		1.0-1.3		4.6							
TP 1070		1.0-1.5		8		19	11	8	50		Clay - Low Plasticity
TP 1074		0.5		14.1		33	22	11	39		Clay - Low Plasticity
TP 1076		0.5-1.0		4.4							

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve.
TP 1079		0.2		59.8							
TP 1079		0.3		21.2		86	63	23	23		Silt - Very High Plasticity
TP 1081		0.2		15.1							
TP 1085		0.5		13.3							
TP 1086		0.2		59.6							
TP 1086		0.6		7.4							
TP 1088		0.2		50.2							
TP 1088		0.5		8							
TP 1091		0.4		30.1		53	26	27	65		Clay - High Plasticity.
TP 1093		0.5		23.2							
TP 1093		1.5		12.9		25	20	5	58		Silt - Low Plasticity
TP 1093		2.5		13.1							
TP 1100		0.2		89.7							
TP 1100		0.5		371.2							
TP 1100		1.0		305		337	279	58	75		Organic Silt - Extremely High Plasticity
TP 1100		2.0		40.2							
TP 1111		0.2		177							
TP 1111		1.0		15.5							
TP 1111		2.0		17.8		24	16	8	64		Clay - Low Plasticity
TP 1111		3.0		17.4							
TP 1111		4.0		11.3		21	11	10	62		Clay - Low Plasticity
TP 1134		0.1		397.8		146	118	28			Organic Silt - Extremely High Plasticity
TP 1137		0.2		18.3		55	44	11	40		Silt - High Plasticity
TP 1150		0.2		41.1							
TP 1150		0.4		10.8		20	12	8	63		Clay - Low Plasticity
TP 1160		0.4		10.6							
TP 1160		1.4		8.9							
TP 1160		2.4		14.9		40	23	17	31		Clay - Intermediate plasticity
TP 1162		0.2		206.2							
TP 1162		1.0		14.4		25	15	10	77		Clay - Low Plasticity
TP 1196		0.2		139.3							
TP 1202		0.3		28.6		44	31	13	63		Silt - Intermediate Plasticity
TP 1203		0.15		54.9							
TP 1205		0.3-0.7		10		24	14	9	51		Clay - Low Plasticity
TP 1216		0.5-0.8		5.6							
TP 1217		0.4-0.8		8.5							
TP 1220		0.9		10.7							
TP 1227		0.5-1.0		6.4							
TP 1228		0.5-1.0		5.5							
TP 1230		1.6		7.1		16	12	4	58		Silt - Low Plasticity
TP 1232		1.5		8.3		18.4	11.4	7			Clay - Low Plasticity
TP 1233		1.0-1.5		10.8		20	12.5	7.5	66		Clay - Low Plasticity
TP 1236		0.5-0.8		9.4		21	13	8	55		Clay - Low Plasticity
TP 1238		0.3		40.9							
TP 1241		0.4		33.4							
TP 1242		0.4		19.5							
TP 1243		0.2		15.4							
TP 1243		0.5		17.4		26	16	10	61		Clay - Low Plasticity

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve.
TP 1247		0.5		12.2		25	19	5	57		Silt - Low Plasticity
TP 1247		2.2		11.2					56		
TP 1250		0.7		10.5		21	13	8	66		Clay - Low Plasticity
TP 1256		0.2		41.3							
TP 1257		0.5		11.3							
TP 1257		1		9.8							
TP 1257		1.7		10.2		20	13	7	71		Clay - Low Plasticity
TP 1258		0.2		31.5							
TP 1258		0.5		15.8		27	17	10	46		Clay - Low Plasticity
TP 1260		0.3		36.7							
TP 1260		0.5		13.8		21	15	7	64		Clay - Low Plasticity
TP 1262		0.4		62.4		88	78	10	87		Silt - Very High Plasticity
TP 1263		0.2		22.3							
TP 1263		0.5		11.7		22	18	4	61		Silt - Low Plasticity
TP 1263		0.6		11.3							
TP 1265		0.5		33.6							
TP 1270		0.5		12.7		26	20	7	54		Clay Low Plasticity
TP 1275		0.3		26.6							
TP 1275		0.5		15.3		25	16	9	66		Clay - Low Plasticity
TP 1277		0.5		20.6							
TP 1282		0.4		21.9					76		
TP 1286		0.4		23.9		38	30	7			Silt - Intermediate Plasticity
TP 1287		0.4		34.5							
TP 1288		0.4		22.1							
TP 1288		0.6		12.2		28	19	9	67		Clay - Low Plasticity
TP 1288		0.8		13.8							
TP 1289		0.5		20.8							
TP 1291		0.3		23.8							
TP 1291		0.6		27.1							
TP 1293		0.3		27.5							
TP 1295		0.4		28.5							
TP 1298		0.8		9.3		25	17	8	59		Clay - Low Plasticity
TP 1300		0.3		24.4							
TP 1301		0.2		26.8							
TP 1301		0.5		8.2		23	15	8	47		Clay - Low Plasticity
TP 1303		0.4		27.9							
TP 1303		1.0		10.9		24	14	10	67		Clay - Low Plasticity
TP 1303		1.5		11.2							
TP 1402		0.3		27.8		107	87	20			Silt - Extremely High Plasticity
TP 1402		1.0		24.4							
TP 1406		0.5		932.9							
TP 1406		1.5		1218							
TP 1407		0.3		719.5							
TP 1407		1.5		1199.8							
TP 1407		2.4		967.1							
TP 1411		0.8		28		100	70.2	29.8			Silt - Extremely High Plasticity
TP 1411		1.2		9		NON PLASTIC			8		
TP 1412		0.5		26.7		121	92.5	28.5			Silt - Extremely High Plasticity
TP 1413		0.5-1.2		10		NON PLASTIC			5		
TP 1416		0.7		828.6							

Borehole/ Trialpit	Type	Depth m	Bulk Density Mg/m3	Moisture Content %	Particle Density Mg/m3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425 micron %		Description of fraction passing 425 Silt - Intermediate Plasticitycron sieve
TP 1417		1.5		38							
TP 1417		2.0		17.9							
TP 1419		0.3		788							
TP 1422		1.6-2.1		9.6							
TP 1423		0.9-1.3		15.7							
TP 1424		0.5-1.0		4.1							
TP 1427		0.7		3.5							
TP 1428		0.5		30.4		33	25	8	64		Clay - Low Plasticity
TP 1428		1.1		11.1		19	13	6	54		Clay - Low Plasticity
TP 1428		1.9		8.8							
TP 1429		0.0-0.3		218.2							
TP 1429		2.2-2.4		8.9		14	12	3	53		Silt - Low Plasticity
TP 1430		1.3		25.5							
TP 1430		0.5-1.0		1076.1							
TP 1431		0.5		500.9							
TP 1431		1.0		13							
TP 1432		1.0		13.6							
TP 1435		1.0		883.5							
TP 1436		1.0		10.9		21	13.3	7.7			Clay - Low Plasticity
TP 1436		1.5		9.9		19	13	6			Clay - Low Plasticity
TP 1439		0.7		708.9							
TP 1439		1.7		868.3							
TP 1439		2.5		583.4							
TP 1439		3.1		714.6							
TP 1440		0.1		43.1							
TP 1440		0.7		7.7		25.2	21.2	4			Silt - Low Plasticity
TP 1441		0.2		21.1							
TP 1441		0.8		10.4		25	15	9	54		Clay - Low Plasticity
TP 1441		1.7		9.3							
TP 1442		0.5		15.3		37.7	25.9	11.8			Silt - Intermediate Plasticity
TP 1443		0.2		22.5							
TP 1443		0.5		10.7		43	27	16	18		Silt - Intermediate Plasticity
TP 1443		1.2		8.3							
TP 1444		0.2		17.6							
TP 1444		0.5		17.7		47	32.2	14.8			Silt - Intermediate Plasticity
TP 1444		1.3		12.2							
TP 1445		0.2		27.8							
TP 1445		0.8		12.7		38	33	4	24		Silt - Intermediate Plasticity
TP 1446		0.1		122.2							
TP 1446		0.5		14		22	14	8	21		Clay - Low Plasticity
TP 1446		1.3		40.6							
TP 1447		0.3		765							
TP 1447		1.0		940		935	680	255	70		Organic Silt - Extremely High Plasticity
TP 1447		2.9		165.3		151	109	42	93		Organic Silt - Extremely High Plasticity
TP 1452		1.0-2.0		8.4							
TP 1453		0.3		19.7							
TP 1456		0.5		12.1		23	15	7	28		Clay - Low Plasticity
TP 1456		0.8		10.6							
TP 1458		0.5		16		33	23	10	35		Clay - Low Plasticity
TP 1460		1.6		12.8		23	15	8	55		Clay - Low Plasticity
TP 1461		0.5		24.8							
TP 1461		1.0		9.1							
TP 1462		0.2		16.8							

National Materials Testing Laboratory Ltd.

SUMMARY OF TEST RESULTS

					Index Properties			Cell	Undrained Triaxial Tests			
Borehole	Depth	Moisture	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Cu	Mode of
No.	m	%	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	Failure
BH1014	1.00	42.2										
BH1014	2.00	15.3										
BH1024	0.50	631.6										
BH1024B	1.00	618.5										
BH1024B	2.00	213.3										
TP1132	1.00	11.6	58.9	23	13	10						
TP1142	1.00	11.1	69.4	17	12	5						
TP713	0.15	26.4										
TP730	0.40	707.2										
TP740	0.50	849.1										
TP754A	1.50	790.3										
TP754B	0.20	48.5										
TP754C	0.50	348.5										
TP777	0.50	704.2										
TP777	1.8	494.7										
TP779	0.5	37.5										
TP795	0.3	713.0										
TP841B	0.2	120.9										
TP841B	0.8	17.9	77.8	29	17	12						
TP841B	1.9	14.6	62.0	18	11	7						
TP841B	2.7	10.8										

NMTL	Notes:	Job ref No.	NMTL 249	Table
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.	Location	GCOB-Galway County Council	1

National Materials Testing Laboratory Ltd.

SUMMARY OF TEST RESULTS

					Index Properties			Cell	Undrained Triaxial Tests			
Borehole	Depth	Moisture	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Cu	Mode of
No.	m	%	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	Failure
TP870	0.50	22.1										
TP870	2.90	7.9	8.9	non plastic								
TP967	0.10	30.4										
TP978	0.40	32.1	74.4	54	28	26						
TP996	0.20	20.9										
TP996	0.80	8.3										
TP996	1.50	8.7	32.7	21	13	8						
TP1219	0.60m	10.0	48.3	non plastic								
NMTL	Notes :								Job ref No.	NMTL 249		Table
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.								Location	GCOB-Galway County Council		1

IRISH DRILLING LTD.
Loughrea Co. Galway.

Tel: (091)841274 Fax: (091) 847687

Contract N6 Galway City Outer Bypass
Client:
Engineer:

Date: November 2006
Tested By DD Check DJ

Summary of Von Post Classification

Borehole/ Trialpit	Type	Depth m	Moisture Content %	Plant Type Term	Humification Term	Water Content Classification	Fibre Content F/R/W/N	Organic Content LOI	Tensile Strength	Smell	Plasticity	Acidity
BH 0864		0.0-0.5			H3	B0	F3 R2 W0 N1		TV0 TH1	A0	P1	
BH 0888		1.5-2.0	Peat mixed with pieces of damp firm brown-grey SILT / CLAY.									
BH 0888		1.5-2.0			H4	B1	F3 R2 W0 N1		TV1 TH0	A1	P1	
BH 0911 A		0.5-1.0			H3	B1	F3 R2 W0 N1		TV1 TH1	A0	P0	
BH 0911 B		0.5-1.0			H3	B1	F3 R2 W0 N1		TV1 TH0	A0	P0	
BH 0915		0.5-1.0			H3	B2	F3R2W0N0		TV0 TH1	A0	P0	
BH 1182		0.0-1.0			H3	B0	F2 R2 W0 N0		TV0 TH1	A0	P0	
BH 1189		0.0-1.0	Topsoil : soft damp dark brown slightly gravely sandy SILT / CLAY with some roots.									
BH0 896		0.0-1.0			H2	B1	F3 R3 W0 N0		TV3 TH3	A0	P0	
TP 0693		0.4			H2	B0	F3 R2 W0 N0		TV2 TH3	A0	P0	
TP 0716		0.7	Soft damp brown slightly gravelly sandy SILT / CLAY.									
TP 0718		1.5			H6	B1	F2 R1 W0 N1		TV0 TH0	A0	P1	
TP 0721		0.5			H4	B1	F3 R2 W0 N1		TV0 TH1	A0	P1	
TP 0721		0.5			H4	B1	F3 R2 W0 N1		TV0 TH1	A0	P1	
TP 0732 B		0.2			H4	B0	F3 R2 W0 N0		TV0 TH0	A0	P1	
TP 0733 B		0.5			H3	B1	F3 R2 W0 N0		TV0 TH2	A0	P0	
TP 0754 A		0.5			H4	B0	F3 R1 W0 N1		TV1 TH1	A0	P1	
TP 0754 C		0.5			H8	B0	F0 R0 W0 N0		TV0 TH0	A0	P1	
TP 0754 C		0.5	Soft damp dark brown slightly sandy SILT / CLAY topsoil, rich with organic matter.									
TP 0833		1.3	Damp dense light brown gravelly silty SAND.									
TP 0840		1.7	Damp firm light brown mottled orange slightly gravelly sandy SILT / CLAY. Contains a few white shells									
TP 0857		1.2	Damp soft light brown mottled white SILT / CLAY with abundant white shells.									
TP 0870		0.5			H2	B1	F3 R1 W0 N1		TV1 TH1	A0	P0	
TP 0870		2.9	Damp soft grey SILT / CLAY with abundant fibres and high organic content.									
TP 0876		1.4			H8	B0	F3 R1 W0 N1		TV0 TH0	A0	P1	
TP 0876		1.9	Damp soft light brown mottled white SILT / CLAY with a few white shells.									
TP 0894		3.1	Soft damp grey-brown mottled white SILT / CLAY. Contains abundant white shells and fibres.									
TP 0895		2.0-2.5			H3	B3	F3 R1 W0 N0		TV2 TH1	A1	P1	
TP 0897		1.5-2.0			H3	B3	F3 R1 W0 N0		TV2 TH1	A0	P1	
TP 0906		1.0-1.2			H4	B1	F3 R1 W0 N1		TV1 TH0	A0	P1	
TP 0907		1.0-1.2			H2	B1	F2 R1 W2 N1		TV2 TH2	A0	P1	
TP 0907		1.8-2.0			H2	B1	F3 R1 W0 N1		TV2 TH2	A1	P0	
TP 0941 A		2.0			H7	B1	F3 R1 W1 N1		TV0 TH0	A1	P1	
TP 1023		1.0-1.5			H5	B4	F4 R0 W0 N0		TV0 TH1	A0	P1	
TP 1429		1.0-1.2			H6	B1	F3 R1 W0 N1		TV0 TH0	A0	P1	

Project Name:	GCOB	Date received:	12/1/2006
		Date sampled:	1/4/2007
Client:	Irish Drilling	Date tested:	20-30/01/2007
Project No:	GCOB	Our job/report no: 4949	Date reported: 2/5/2007

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
RC936		6.00	Grey clayey sandy very silty GRAVEL	2.1	21	13	8	39	
RC936		40.00	Grey slightly sandy clayey SILT	32	61	41	20	98	
RC936		46.00	Dark grey slightly sandy clayey SILT	39	76	43	33	92	
RC936		51.00	Dark grey slightly gravelly very sandy clayey SILT	24	49	28	21	68	
RC936		55.50	Grey clayey silty very sandy GRAVEL	5.6	23	18	5	40	
RC937		11.00	Dark grey very sandy silty CLAY	11	31	16	15	98	
RC937		16.00	Dark grey slightly gravelly very sandy clayey SILT	18	30	15	15	87	
RC937		19.00	Dark grey slightly gravelly very sandy clayey SILT	40	84	52	32	97	
RC937		26.00	Dark grey slightly sandy clayey SILT	29	73	44	29	93	
RC937		32.00	Dark grey slightly sandy clayey SILT	31	69	44	25	97	
RC937		36.00	Dark grey slightly gravelly slightly sandy clayey SILT	29	59	34	25	95	
RC937		49.00	Dark grey slightly sandy clayey SILT	14	52	24	28	97	
RC940		10.00	Dark grey brown slightly sandy clayey SILT	38	68	41	27	94	
RC940		14.00	Dark grey slightly sandy clayey SILT	32	59	37	22	100	
RC940		19.00	Dark grey clayey very silty SAND	31	57	37	20	99	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.3 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: kp
Date: 2/5/2007

IRISH DRILLING LTD.
Loughrea Co. Galway.

Tel: (091)841274 Fax: (091) 847687

Contract N6 Galway City Outer Bypass
Client:
Engineer:

Date: November 2006
Tested By DD Check DJ

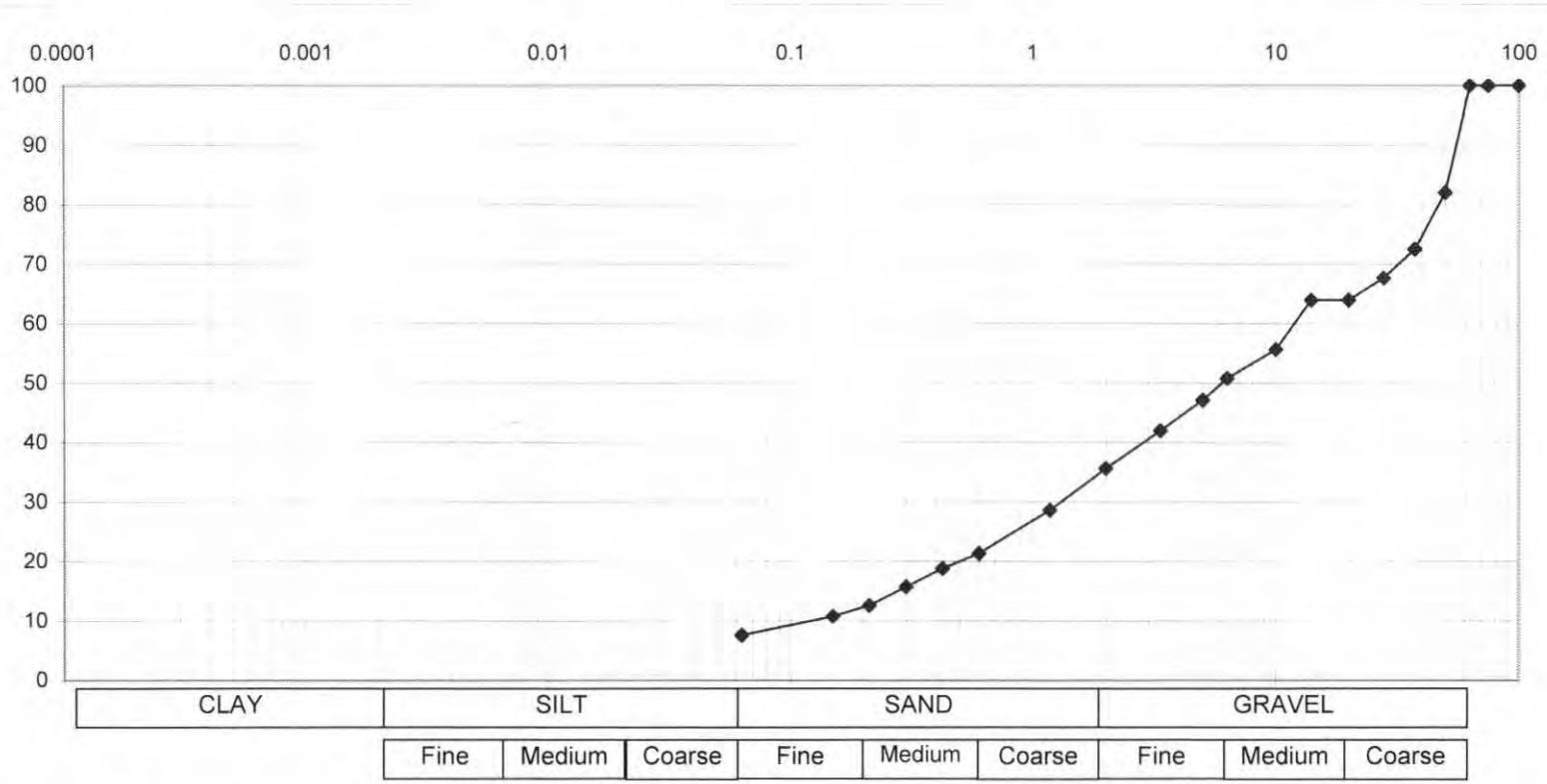
Summary of Von Post Classification

Borehole/ Trialpit	Type	Depth m	Moisture Content %	Plant Type Term	Humification Term	Water Content Classification	Fibre Content F/R/W/N	Organic Content LOI	Tensile Strength	Smell	Plasticity	Acidity
BH 0864		0.0-0.5			H3	B0	F3 R2 W0 N1		TV0 TH1	A0	P1	
BH 0888		1.5-2.0	Peat mixed with pieces of damp firm brown-grey SILT / CLAY.									
BH 0888		1.5-2.0			H4	B1	F3 R2 W0 N1		TV1 TH0	A1	P1	
BH 0911 A		0.5-1.0			H3	B1	F3 R2 W0 N1		TV1 TH1	A0	P0	
BH 0911 B		0.5-1.0			H3	B1	F3 R2 W0 N1		TV1 TH0	A0	P0	
BH 0915		0.5-1.0			H3	B2	F3R2W0N0		TV0 TH1	A0	P0	
BH 0934		0.5-1.0			H3	B2	F3R2W0N2		TV1TH1	A0	P0	
BH 0939		1.5-1.95			H9	B2	F3 R0 W0 N0		TV1 TH0	A0	P1	
BH 1182		0.0-1.0			H3	B0	F2 R2 W0 N0		TV0 TH1	A0	P0	
BH 1189		0.0-1.0	Topsoil : soft damp dark brown slightly gravely sandy SILT / CLAY with some roots.									
BH0 896		0.0-1.0			H2	B1	F3 R3 W0 N0		TV3 TH3	A0	P0	
TP 0693		0.4			H2	B0	F3 R2 W0 N0		TV2 TH3	A0	P0	
TP 0716		0.7	Soft damp brown slightly gravelly sandy SILT / CLAY.									
TP 0718		1.5			H6	B1	F2 R1 W0 N1		TV0 TH0	A0	P1	
TP 0721		0.5			H4	B1	F3 R2 W0 N1		TV0 TH1	A0	P1	
TP 0721		0.5			H4	B1	F3 R2 W0 N1		TV0 TH1	A0	P1	
TP 0732 B		0.2			H4	B0	F3 R2 W0 N0		TV0 TH0	A0	P1	
TP 0733 B		0.5			H3	B1	F3 R2 W0 N0		TV0 TH2	A0	P0	
TP 0754 A		0.5			H4	B0	F3 R1 W0 N1		TV1 TH1	A0	P1	
TP 0754 C		0.5			H8	B0	F0 R0 W0 N0		TV0 TH0	A0	P1	
TP 0754 C		0.5	Soft damp dark brown slightly sandy SILT / CLAY topsoil, rich with organic matter.									
TP 0795		1.1			H9	B4	F3 R1 W0 N0		TV0 TH0	A0	P1	
TP 0796		0.5		S,C	H2	B2	F2 R3 W1 N1		TV1 TH1	A0	P1	
TP 0833		1.3	Damp dense light brown gravelly silty SAND.									
TP 0840		1.7	Damp firm light brown mottled orange slightly gravelly sandy SILT / CLAY. Contains a few white shells									
TP 0857		1.2	Damp soft light brown mottled white SILT / CLAY with abundant white shells.									
TP 0870		0.5			H2	B1	F3 R1 W0 N1		TV1 TH1	A0	P0	
TP 0870		2.9	Damp soft grey SILT / CLAY with abundant fibres and high organic content.									
TP 0876		1.4			H8	B0	F3 R1 W0 N1		TV0 TH0	A0	P1	
TP 0876		1.9	Damp soft light brown mottled white SILT / CLAY with a few white shells.									
TP 0894		3.1	Soft damp grey-brown mottled white SILT / CLAY. Contains abundant white shells and fibres.									
TP 0895		2.0-2.5			H3	B3	F3 R1 W0 N0		TV2 TH1	A1	P1	
TP 0897		1.5-2.0			H3	B3	F3 R1 W0 N0		TV2 TH1	A0	P1	
TP 0906		1.0-1.2			H4	B1	F3 R1 W0 N1		TV1 TH0	A0	P1	
TP 0907		1.0-1.2			H2	B1	F2 R1 W2 N1		TV2 TH2	A0	P1	
TP 0907		1.8-2.0			H2	B1	F3 R1 W0 N1		TV2 TH2	A1	P0	
TP 0941 A		2.0			H7	B1	F3 R1 W1 N1		TV0 TH0	A1	P1	
TP 1023		1.0-1.5			H5	B4	F4 R0 W0 N0		TV0 TH1	A0	P1	
TP 1429		1.0-1.2			H6	B1	F3 R1 W0 N1		TV0 TH0	A0	P1	
TP 1435		1.0			H5	B3	F3 R1 W0 N0		TV0 TH0	A0	P1	

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	82
37.5	73
28	68
20	64
14	64
10	56
6.3	51
5	47
3.35	42
2	36
1.18	29
0.600	21
0.425	19
0.300	16
0.212	13
0.150	11
0.063	8
0.020	
0.006	
0.002	



Soil Description: **Grey silty very sandy coarse GRAVEL.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

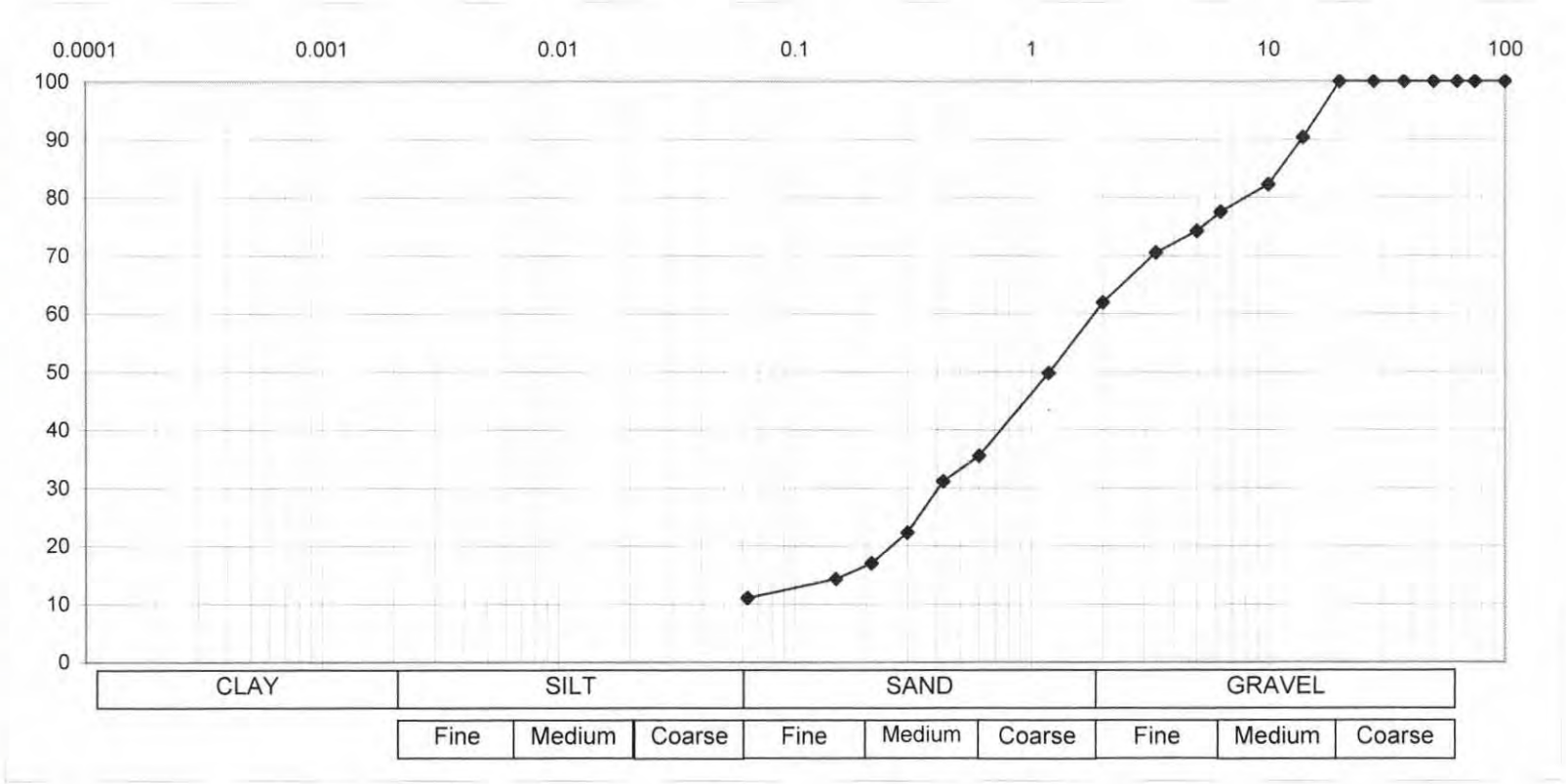
Location
BH 911 A

Depth: **1.5-2.0 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	90
10	82
6.3	77
5	74
3.35	70
2	62
1.18	50
0.600	36
0.425	31
0.300	22
0.212	17
0.150	14
0.063	11
0.020	
0.006	
0.002	



Soil Description: **Brown silty very gravelly medium and coarse SAND.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

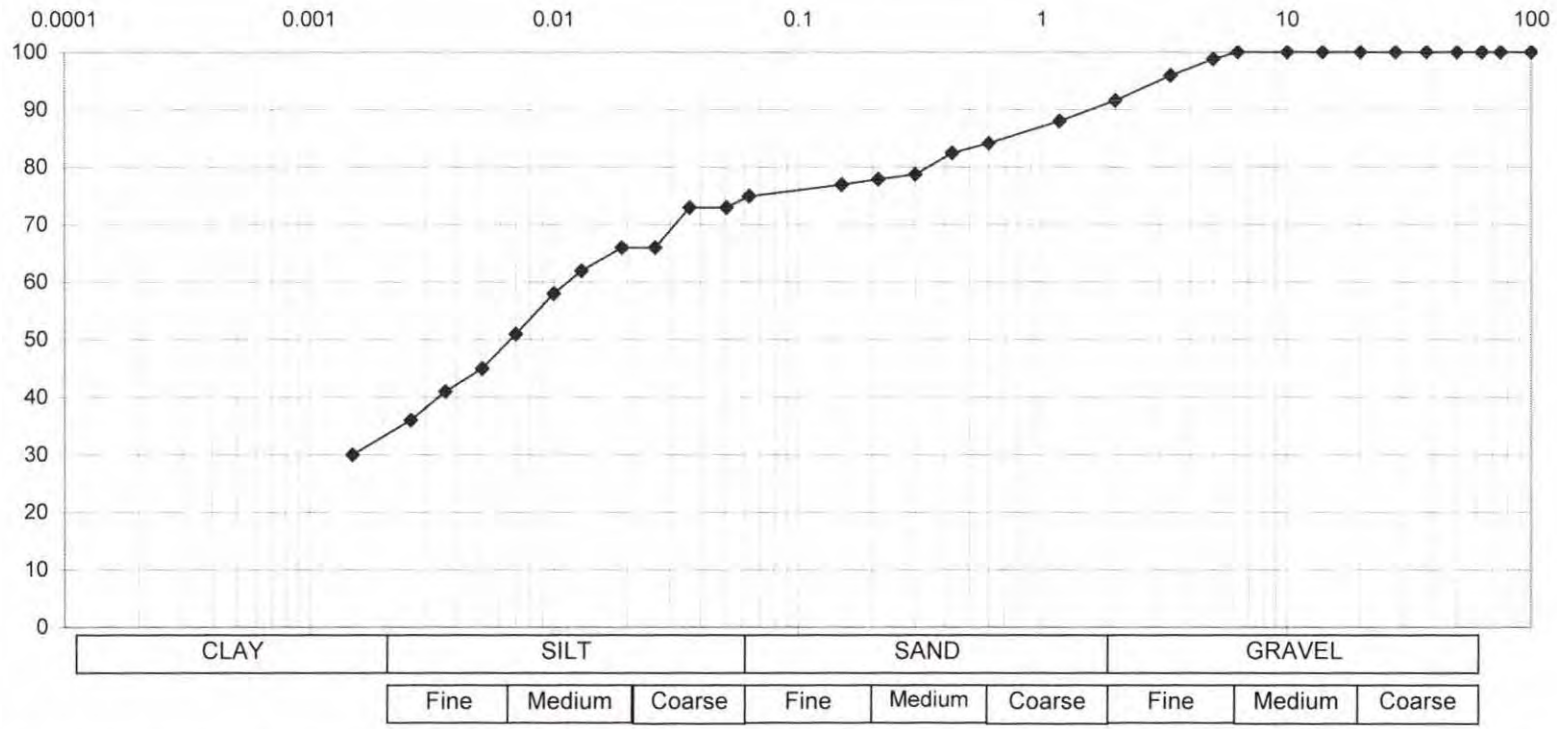
Location
BH 911 B

Depth: **0.5-1.0 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	99
3.35	96
2	92
1.18	88
0.600	84
0.425	82
0.300	79
0.212	78
0.150	77
0.063	75
0.020	66
0.006	48
0.002	34



Soil Description: **Black slightly gravelly slightly sandy organic SILT and PEAT.**

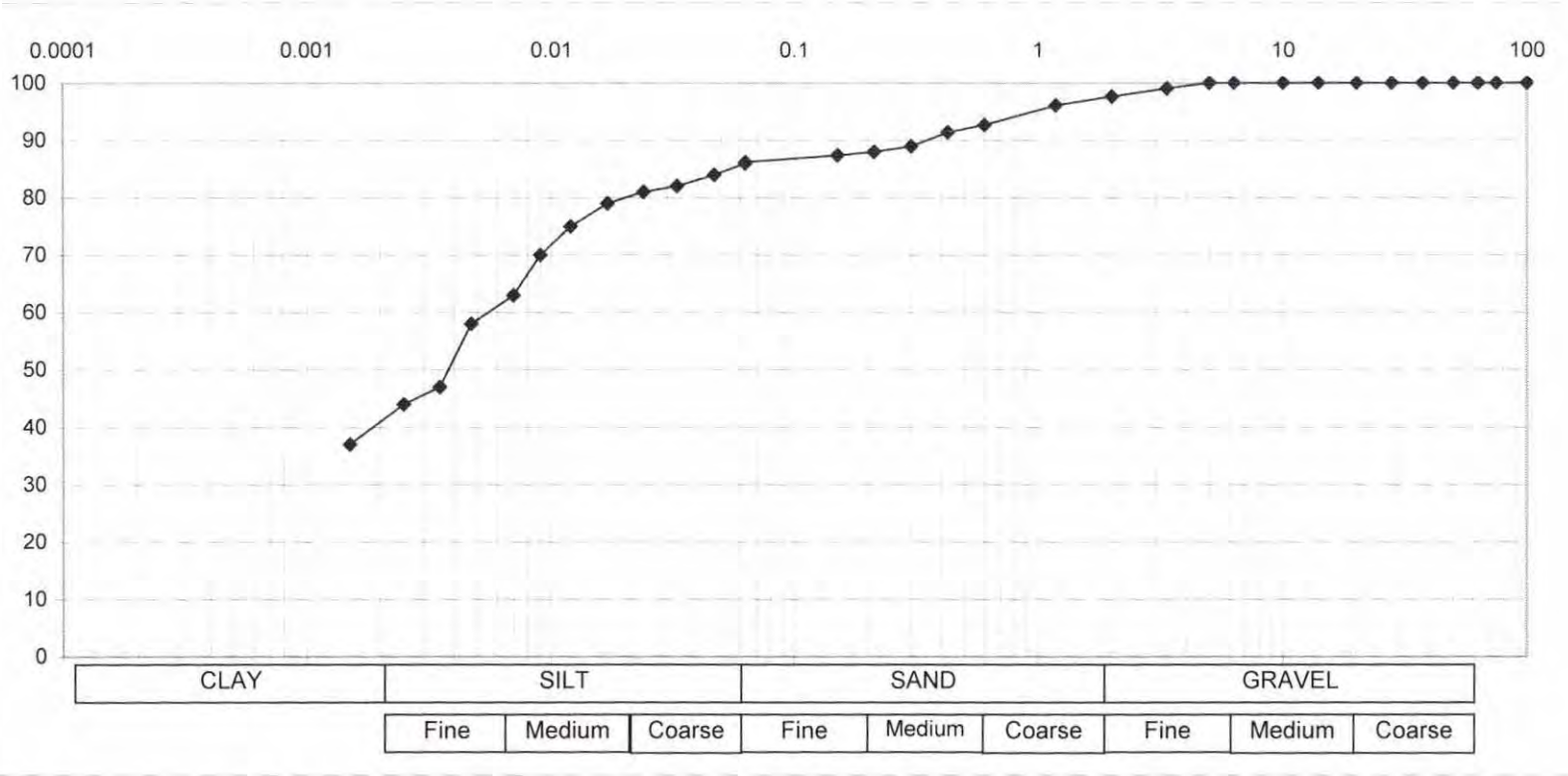
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	22/12/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	BH 934
Depth:	**3.5-4.0 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	99
2	98
1.18	96
0.600	93
0.425	91
0.300	89
0.212	88
0.150	87
0.063	86
0.020	80
0.006	61
0.002	41



Soil Description: **Grey slightly gravelly slightly sandy organic SILT.**

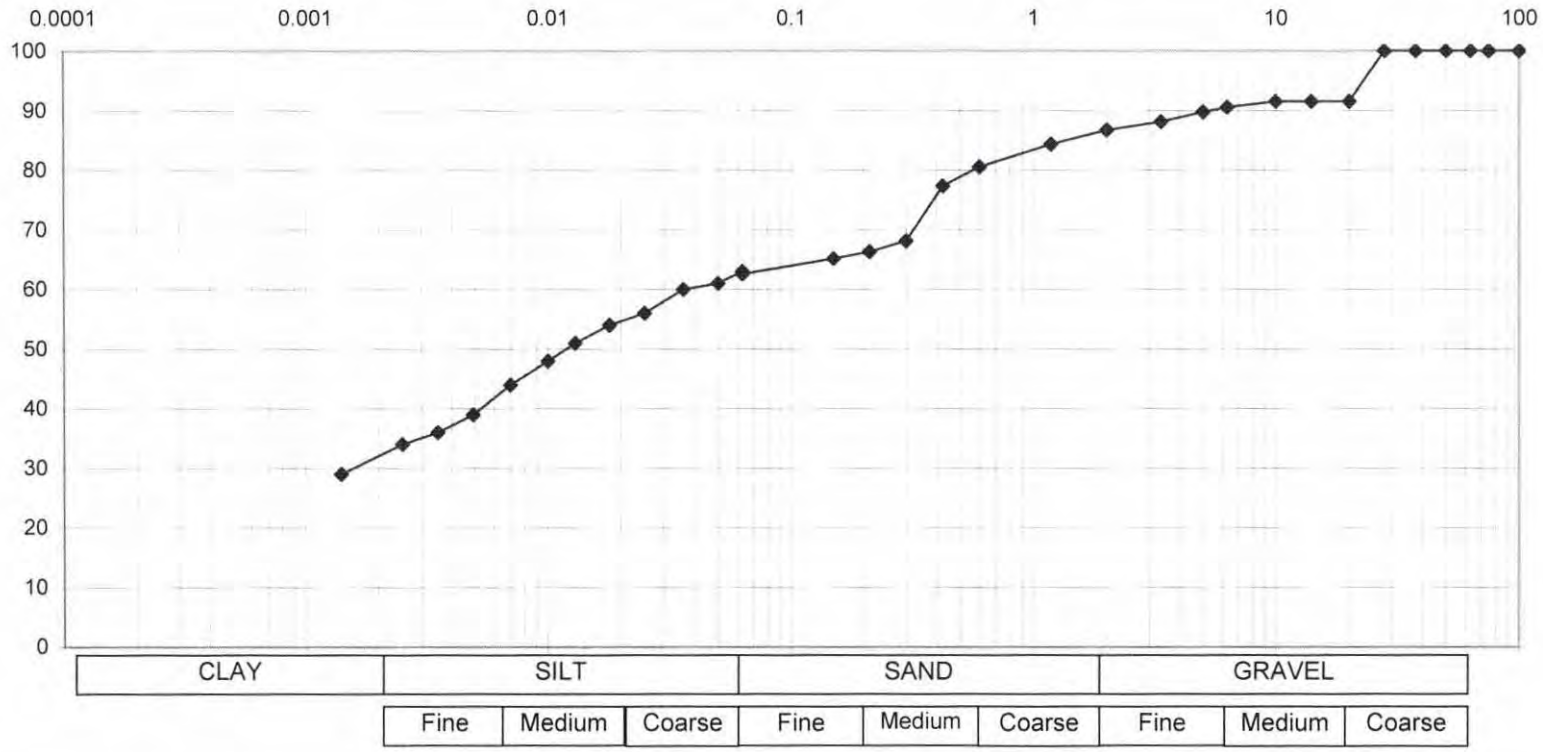
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	22/12/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	BH 934 A
Depth:	**3.5-4.0 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	92
14	92
10	92
6.3	91
5	90
3.35	88
2	87
1.18	84
0.600	81
0.425	77
0.300	68
0.212	66
0.150	65
0.063	63
0.020	55
0.006	42
0.002	32



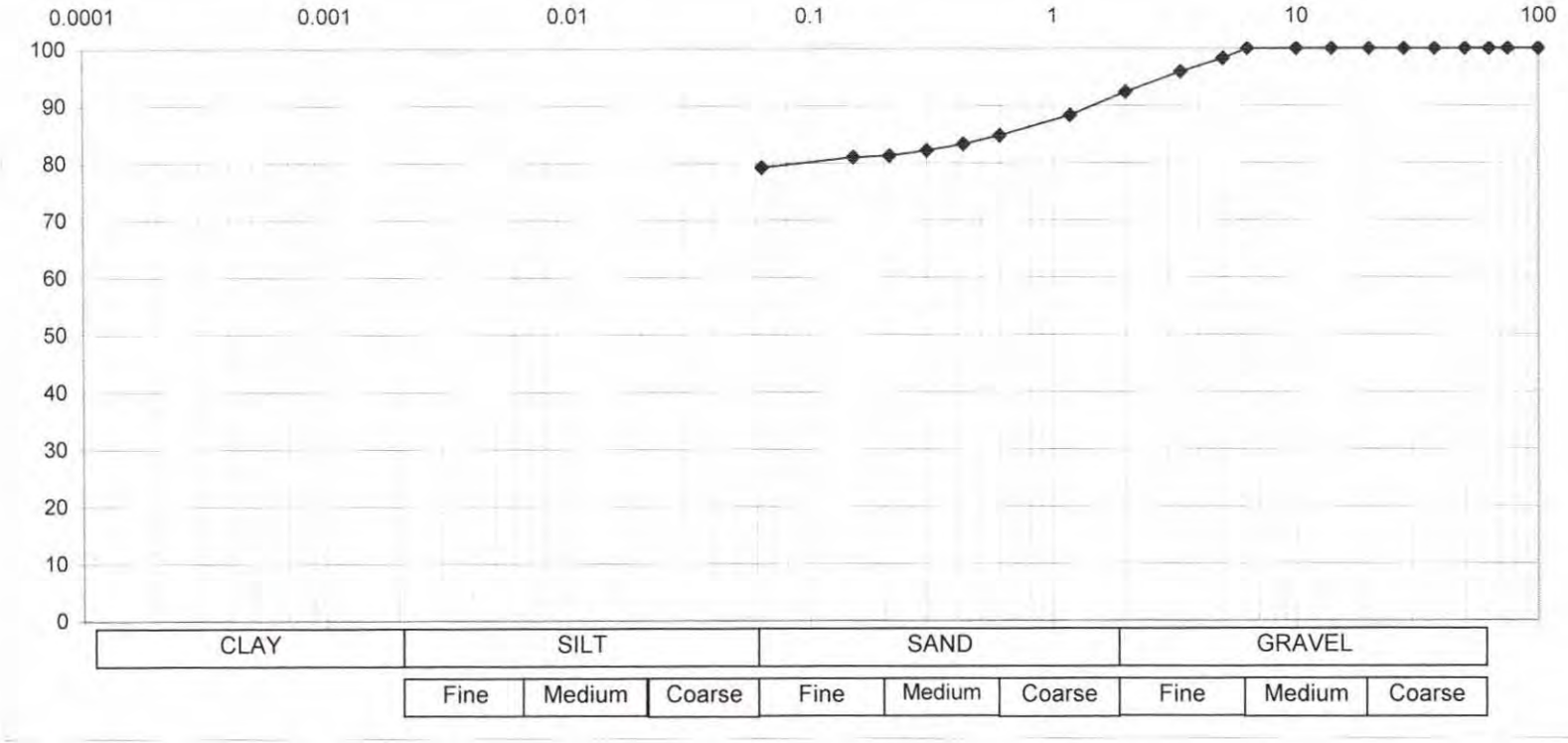
Soil Description: **Black slightly gravelly slightly sandy organic SILT and PEAT.**

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 847687	Contract: Client: Engineer: Date: Tested by:	N6 Galway City Outer Bypass John Barnett & Associates 22/12/2006 DD	Job Code: Checked: DJ	Location **BH 939** Depth: **2.5-3.0 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

2/2/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	98
3.35	96
2	92
1.18	88
0.600	85
0.425	83
0.300	82
0.212	81
0.150	81
0.063	79
0.020	
0.006	
0.002	



Soil Description: **Black slightly gravlely slightly sandy ORGANIC SILT / PEAT.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 29.1.07 Job Code:
Tested by: DD Checked: DJ

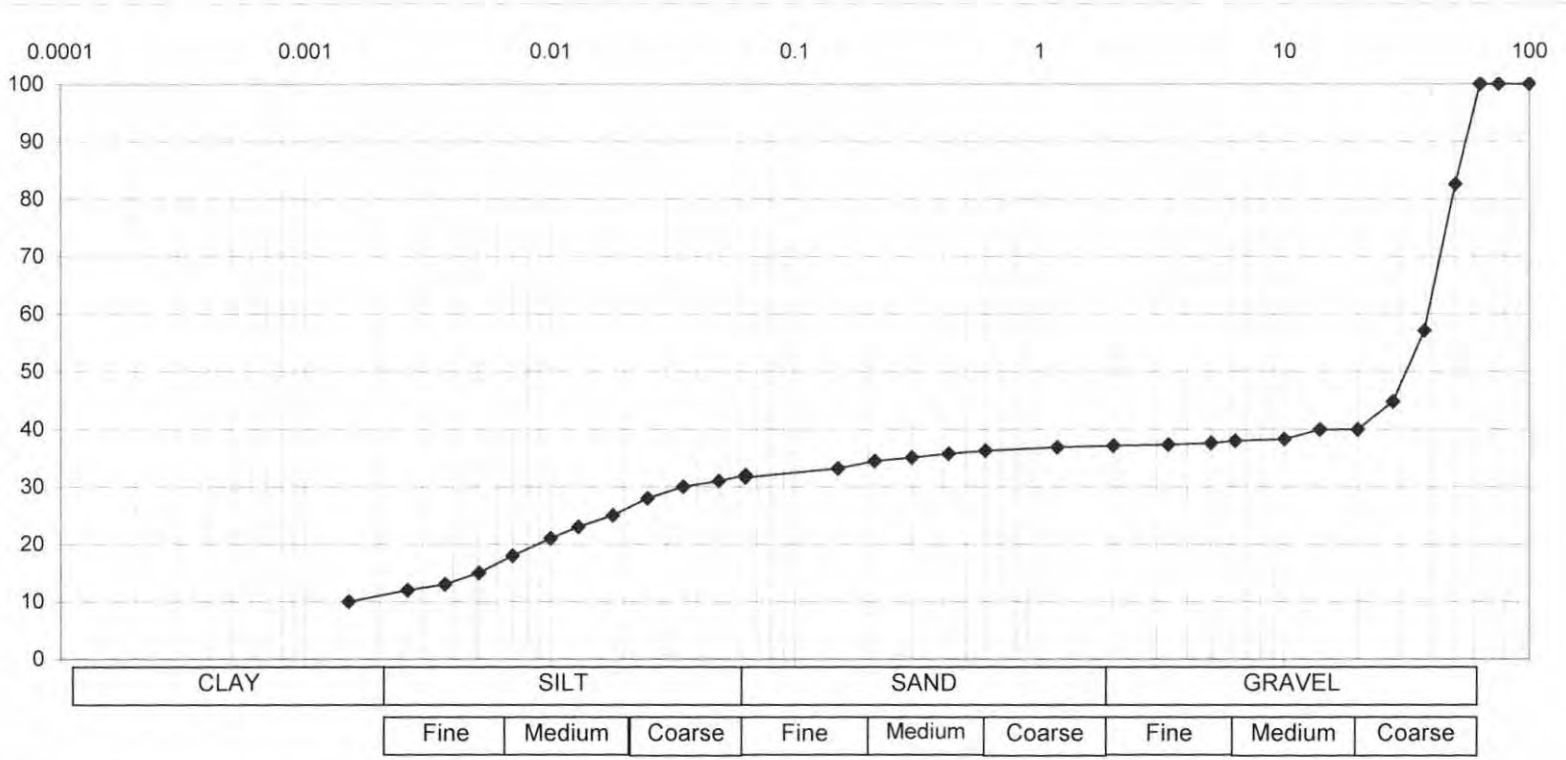
Location
BH 943 A

Depth: **6.5-7.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	83
37.5	57
28	45
20	40
14	40
10	38
6.3	38
5	38
3.35	37
2	37
1.18	37
0.600	36
0.425	36
0.300	35
0.212	34
0.150	33
0.063	32
0.020	26
0.006	18
0.002	11



Soil Description: **Grey sandy very silty coarse GRAVEL.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	22/12/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

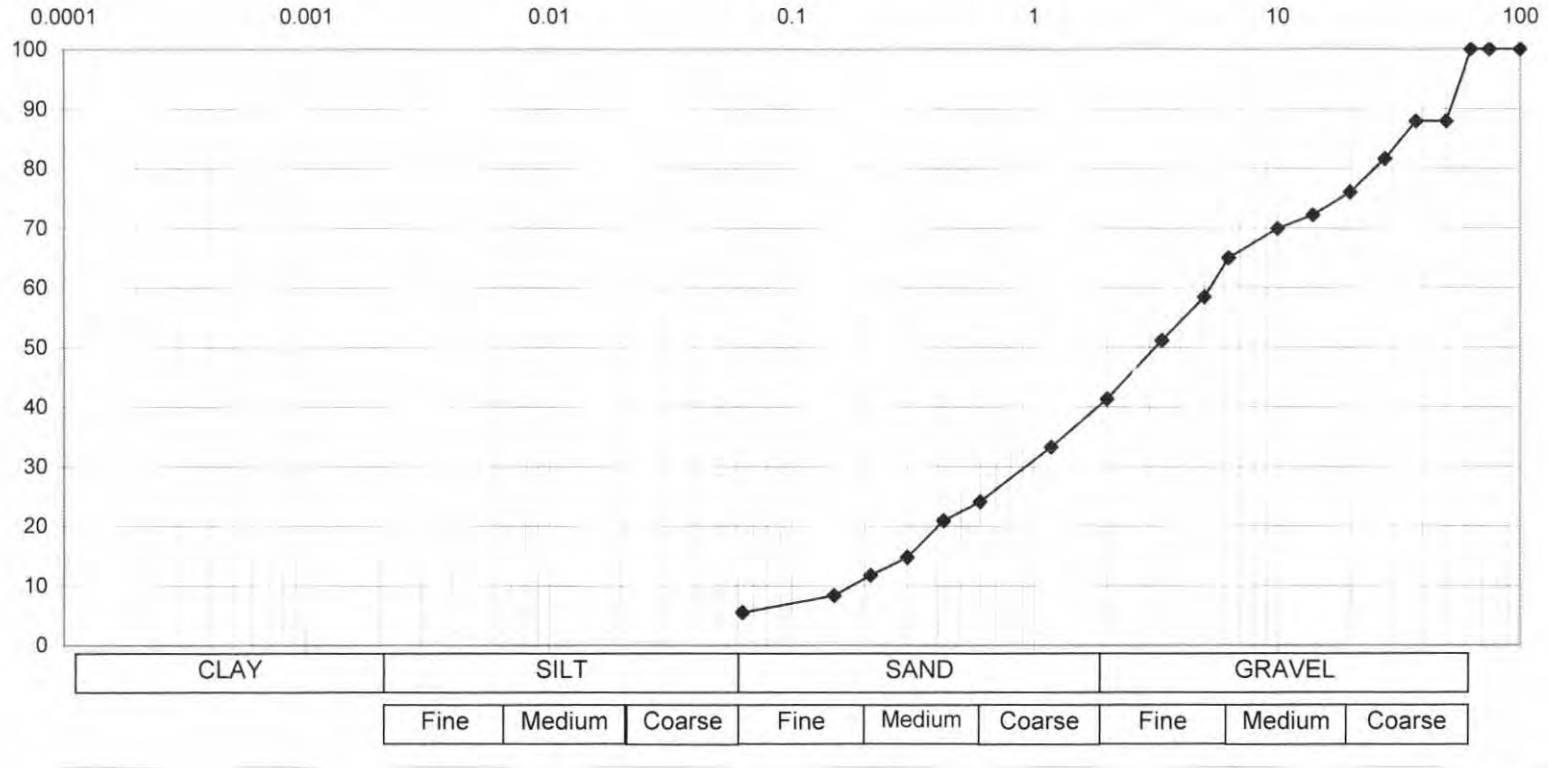
Location
BH 943 A

Depth: **11.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	88
37.5	88
28	82
20	76
14	72
10	70
6.3	65
5	58
3.35	51
2	41
1.18	33
0.600	24
0.425	21
0.300	15
0.212	12
0.150	8
0.063	6
0.020	
0.006	
0.002	



Soil Description: **Brown silty very sandy coarse and fine GRAVEL.**

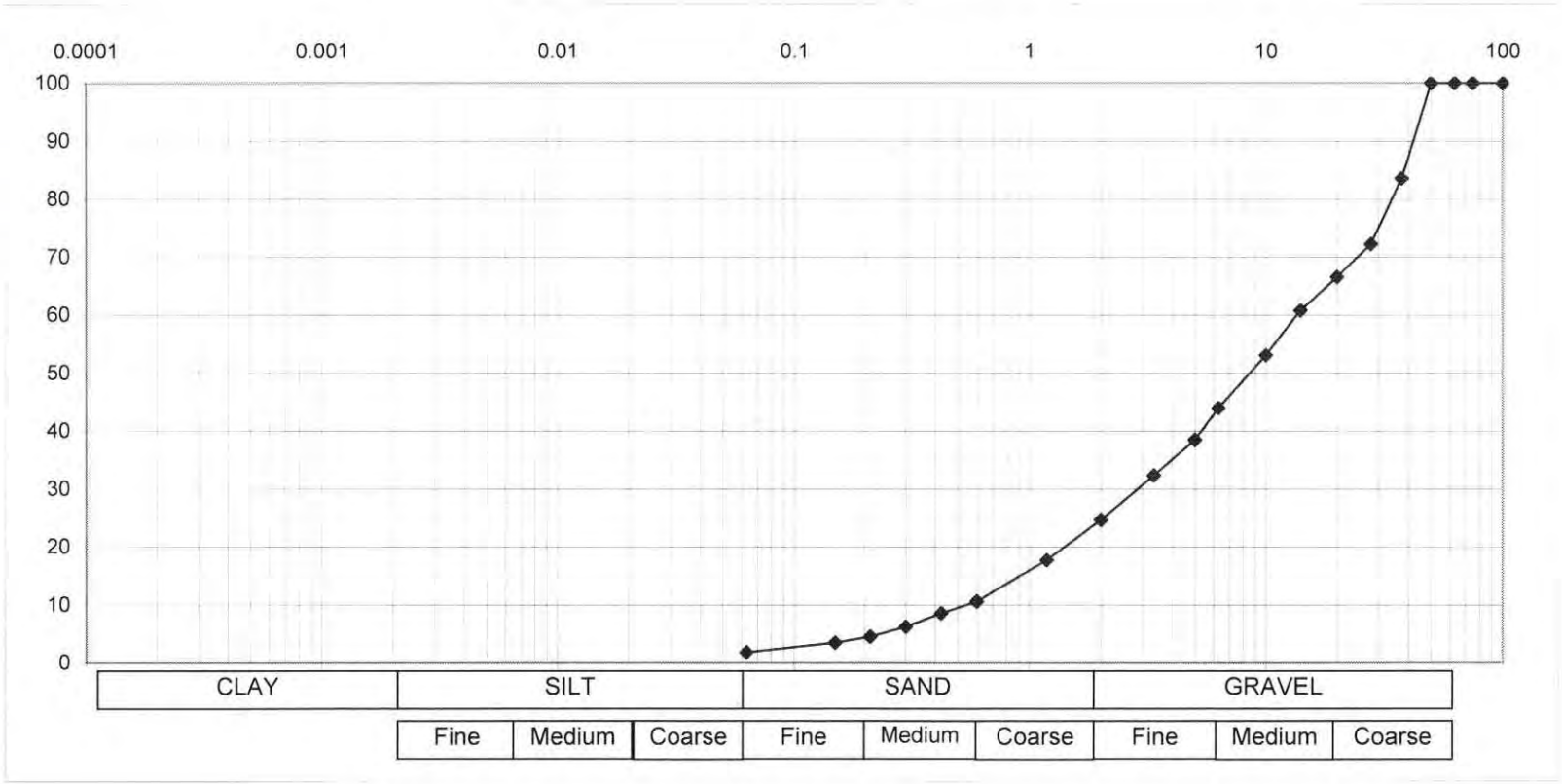
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	26/10/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 525
Depth:	**1.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	84
28	72
20	67
14	61
10	53
6.3	44
5	38
3.35	32
2	25
1.18	18
0.600	11
0.425	9
0.300	6
0.212	5
0.150	4
0.063	2
0.020	
0.006	
0.002	



Soil Description: **Grey slightly silty very sandy coarse GRAVEL.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

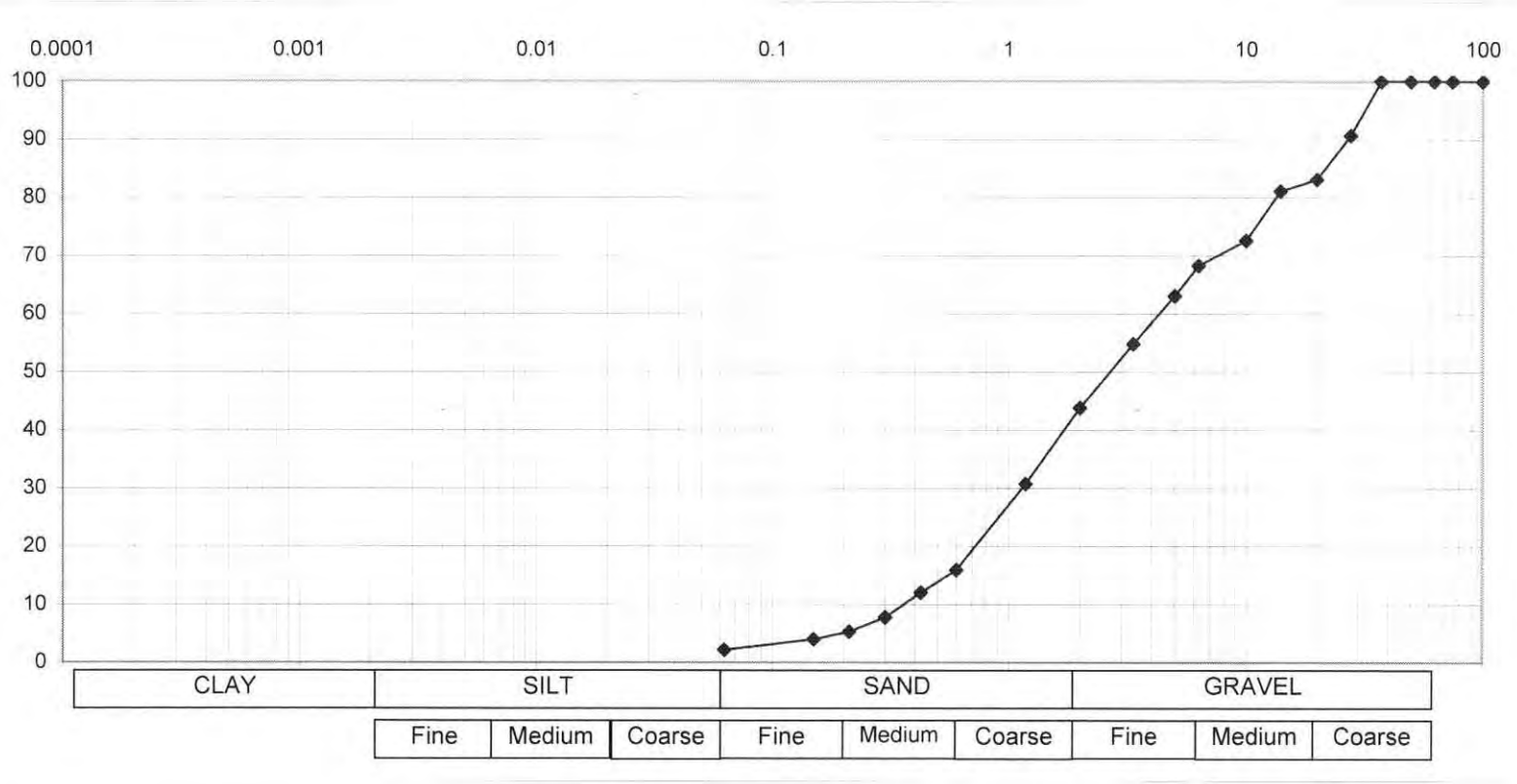
Location
TP 716

Depth: **1.6 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	91
20	83
14	81
10	73
6.3	68
5	63
3.35	55
2	44
1.18	31
0.600	16
0.425	12
0.300	8
0.212	5
0.150	4
0.063	2
0.020	
0.006	
0.002	



Soil Description: **Reddish-brown slightly silty very sandy fine GRAVEL.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 16/11/2006 Job Code:
Tested by: DD Checked: DJ

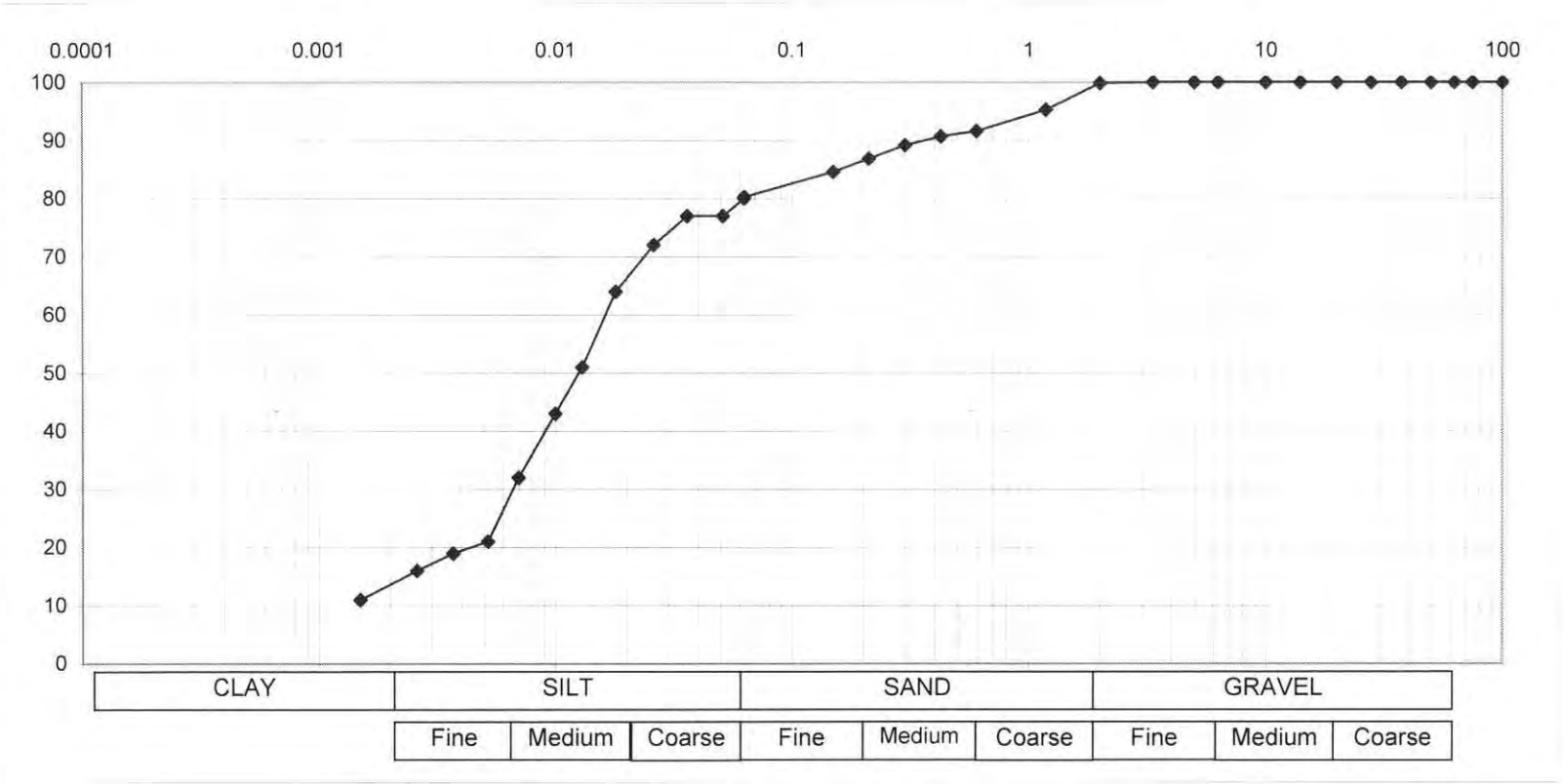
Location
TP 717

Depth: **0.7 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	100
1.18	95
0.600	92
0.425	91
0.300	89
0.212	87
0.150	85
0.063	80
0.020	68
0.006	28
0.002	14



Soil Description: **Grey slightly sandy SILT.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

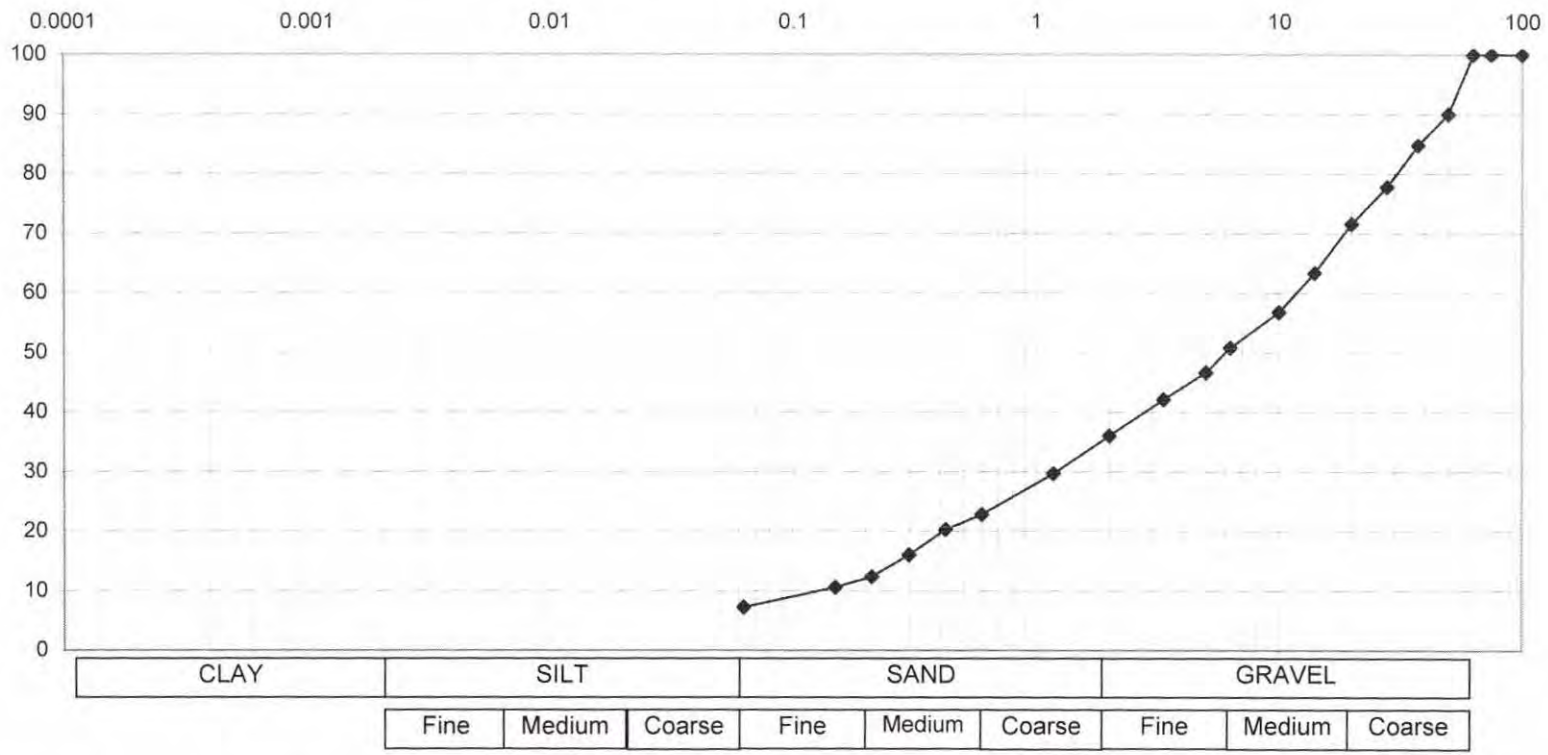
Location
TP 718

Depth: **2.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

1/31/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	90
37.5	85
28	78
20	72
14	63
10	57
6.3	51
5	47
3.35	42
2	36
1.18	30
0.600	23
0.425	20
0.300	16
0.212	12
0.150	11
0.063	7
0.020	
0.006	
0.002	



Soil Description: **Grey silty very sandy medium and coarse GRAVEL.**

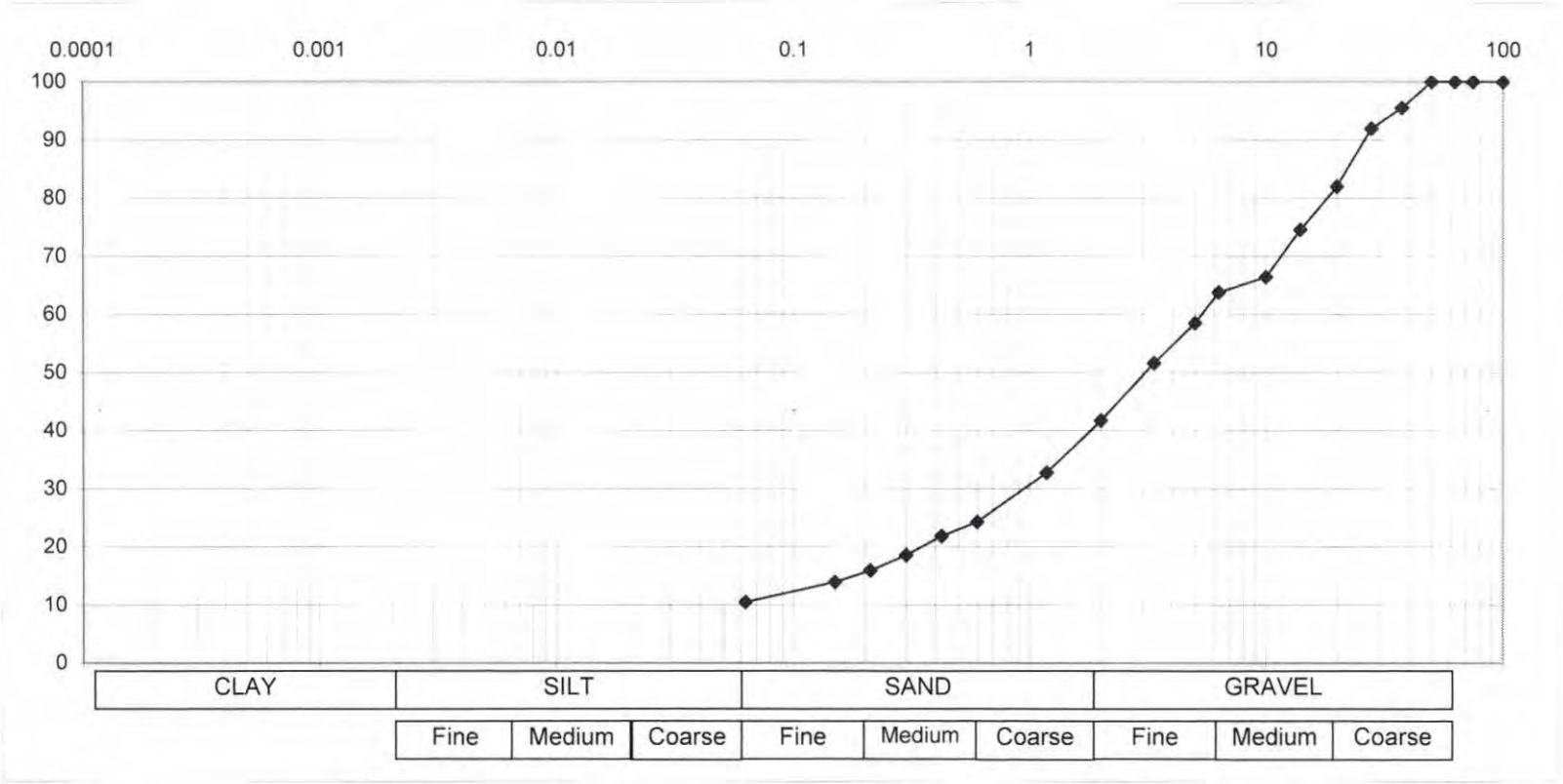
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	22.1.07	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 719
Depth:	**1.6 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	96
28	92
20	82
14	75
10	66
6.3	64
5	58
3.35	52
2	42
1.18	33
0.600	24
0.425	22
0.300	19
0.212	16
0.150	14
0.063	10
0.020	
0.006	
0.002	



Soil Description: **Blackish-grey silty very sandy GRAVEL.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	16/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

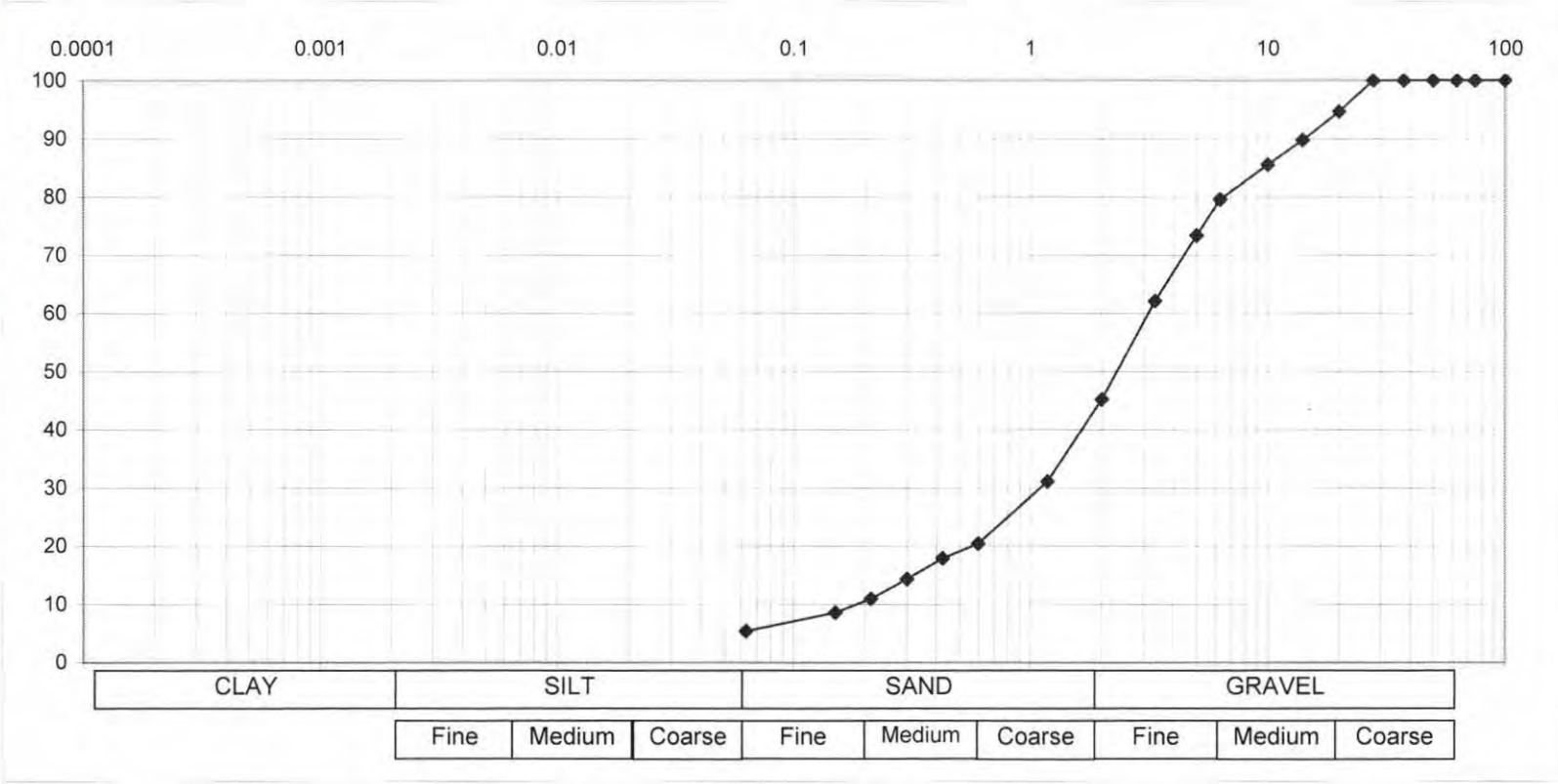
Location **TP 720**

Depth: **1.2 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	95
14	90
10	86
6.3	80
5	73
3.35	62
2	45
1.18	31
0.600	20
0.425	18
0.300	14
0.212	11
0.150	9
0.063	5
0.020	
0.006	
0.002	



Soil Description: **Dark grey slightly silty very sandy fine GRAVEL.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 16/11/2006 Job Code:
Tested by: DD Checked: DJ

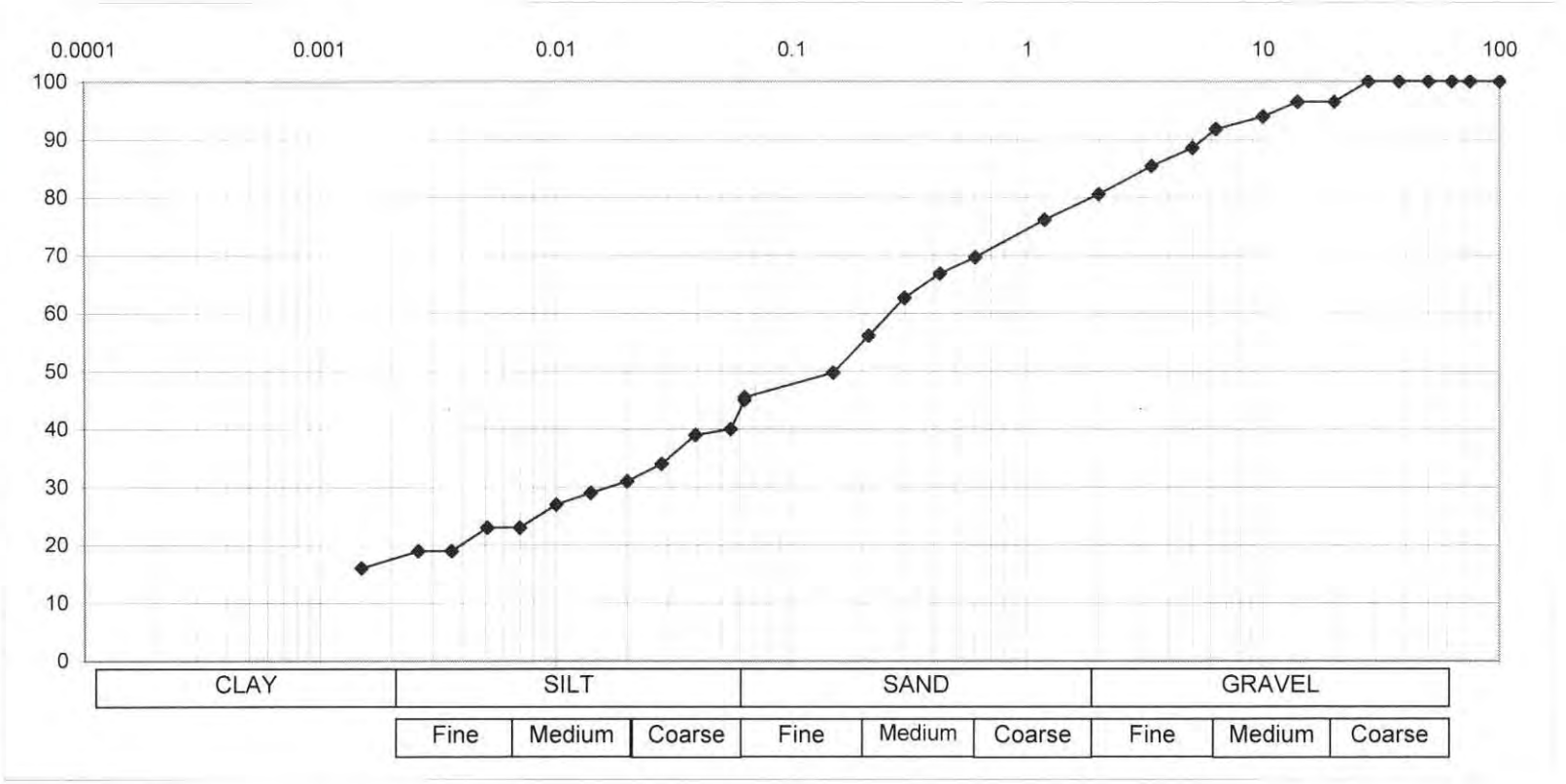
Location **TP 721**

Depth: **1.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	96
14	96
10	94
6.3	92
5	89
3.35	85
2	81
1.18	76
0.600	70
0.425	67
0.300	63
0.212	56
0.150	50
0.063	45
0.020	31
0.006	23
0.002	18



Soil Description: **Grey slightly gravelly sandy SILT.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	16/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

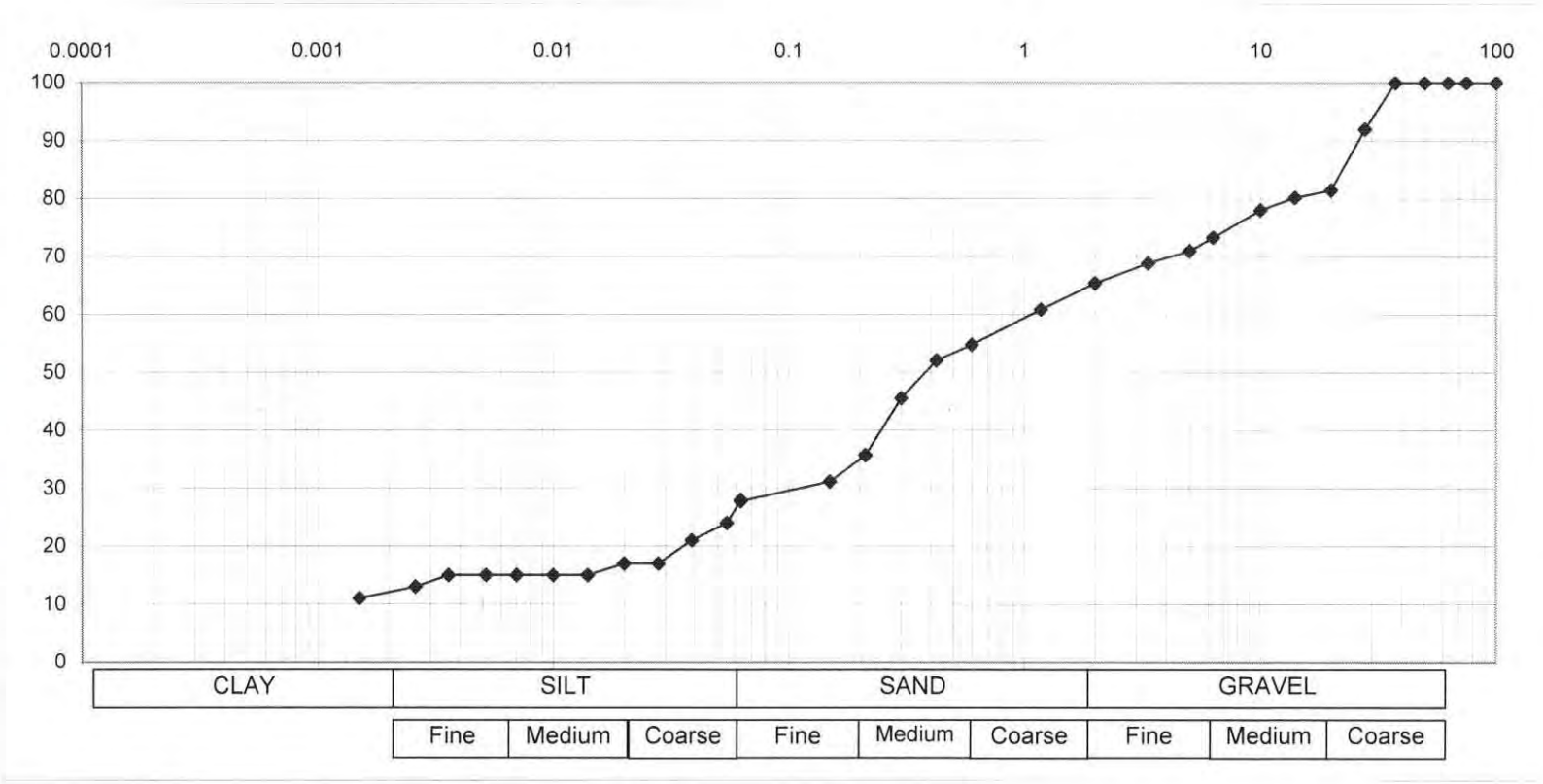
Location **TP 908**

Depth: **0.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	92
20	81
14	80
10	78
6.3	73
5	71
3.35	69
2	65
1.18	61
0.600	55
0.425	52
0.300	46
0.212	36
0.150	31
0.063	28
0.020	17
0.006	17
0.002	12



Soil Description: **Grey very silty very gravelly medium and coarse SAND.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 16/11/2006 Job Code:
Tested by: DD Checked: DJ

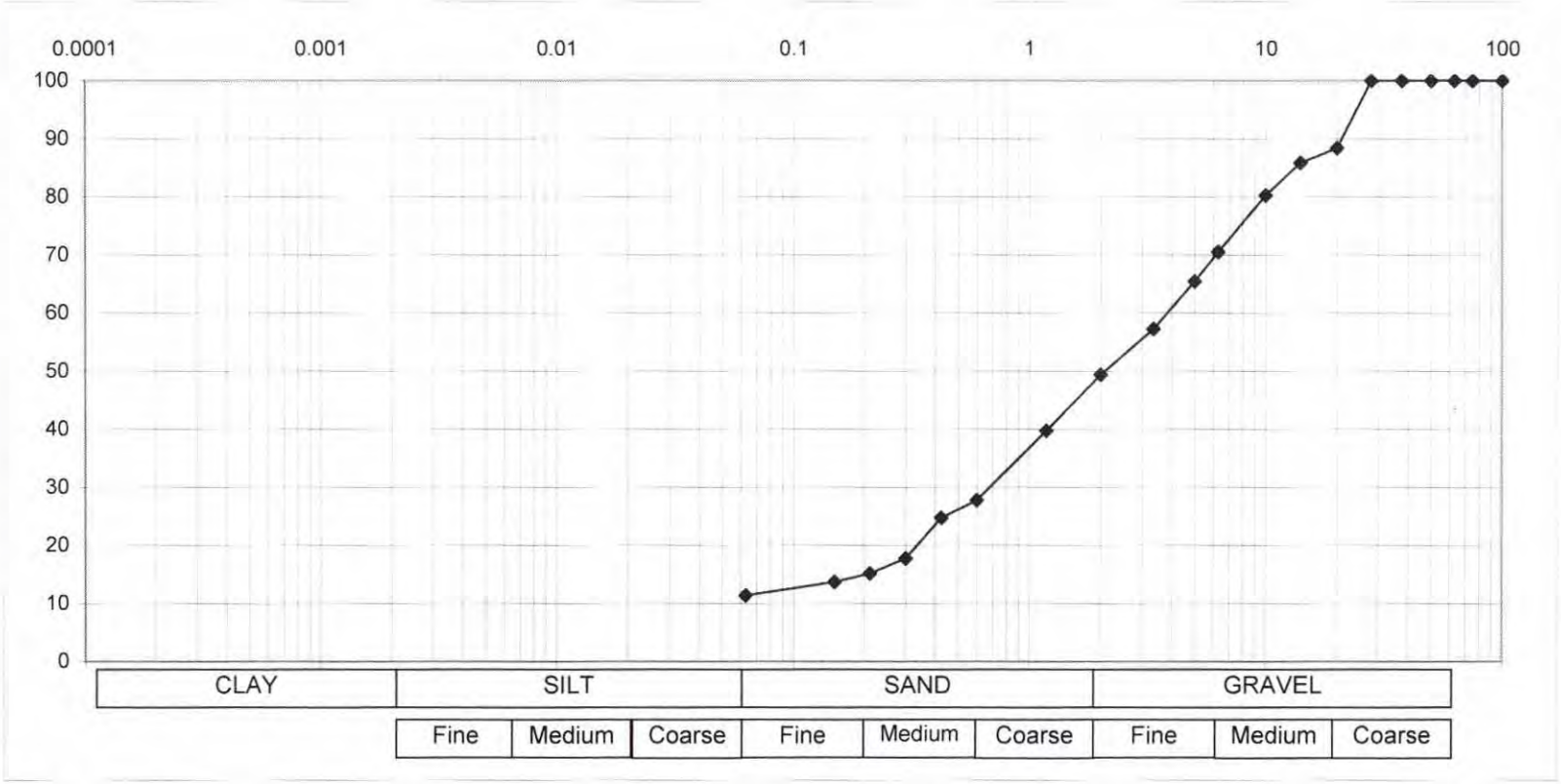
Location
TP 909

Depth: **2 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	88
14	86
10	80
6.3	71
5	65
3.35	57
2	49
1.18	40
0.600	28
0.425	25
0.300	18
0.212	15
0.150	14
0.063	11
0.020	
0.006	
0.002	



Soil Description: **Dark grey silty very sandy medium and fine GRAVEL.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	16/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location **TP 909 A**

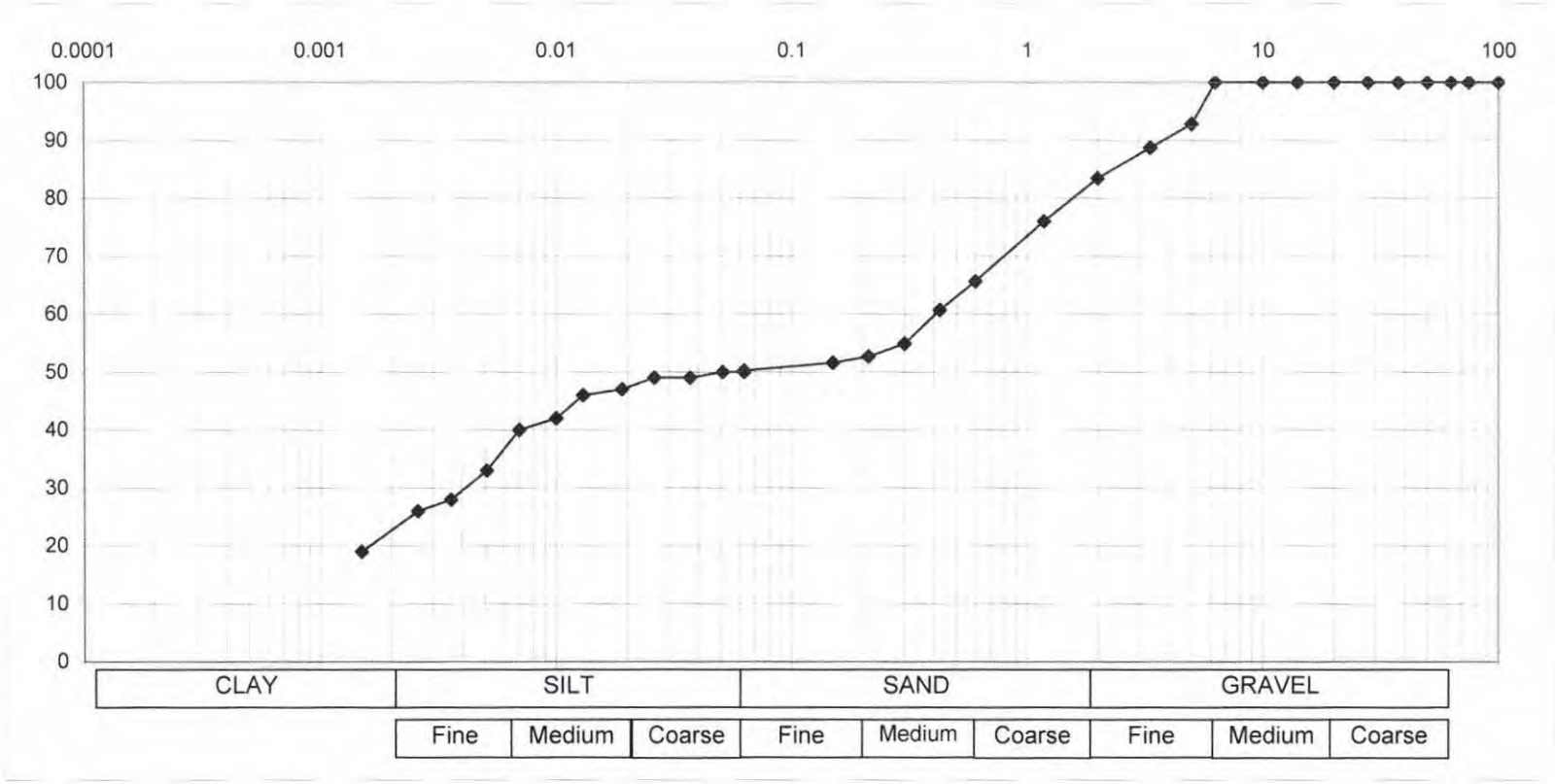
Depth: **1 m**

12/12/2006

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	93
3.35	89
2	83
1.18	76
0.600	66
0.425	61
0.300	55
0.212	53
0.150	52
0.063	50
0.020	48
0.006	38
0.002	22



Soil Description: **Grey slightly gravelly slightly sandy SILT.**

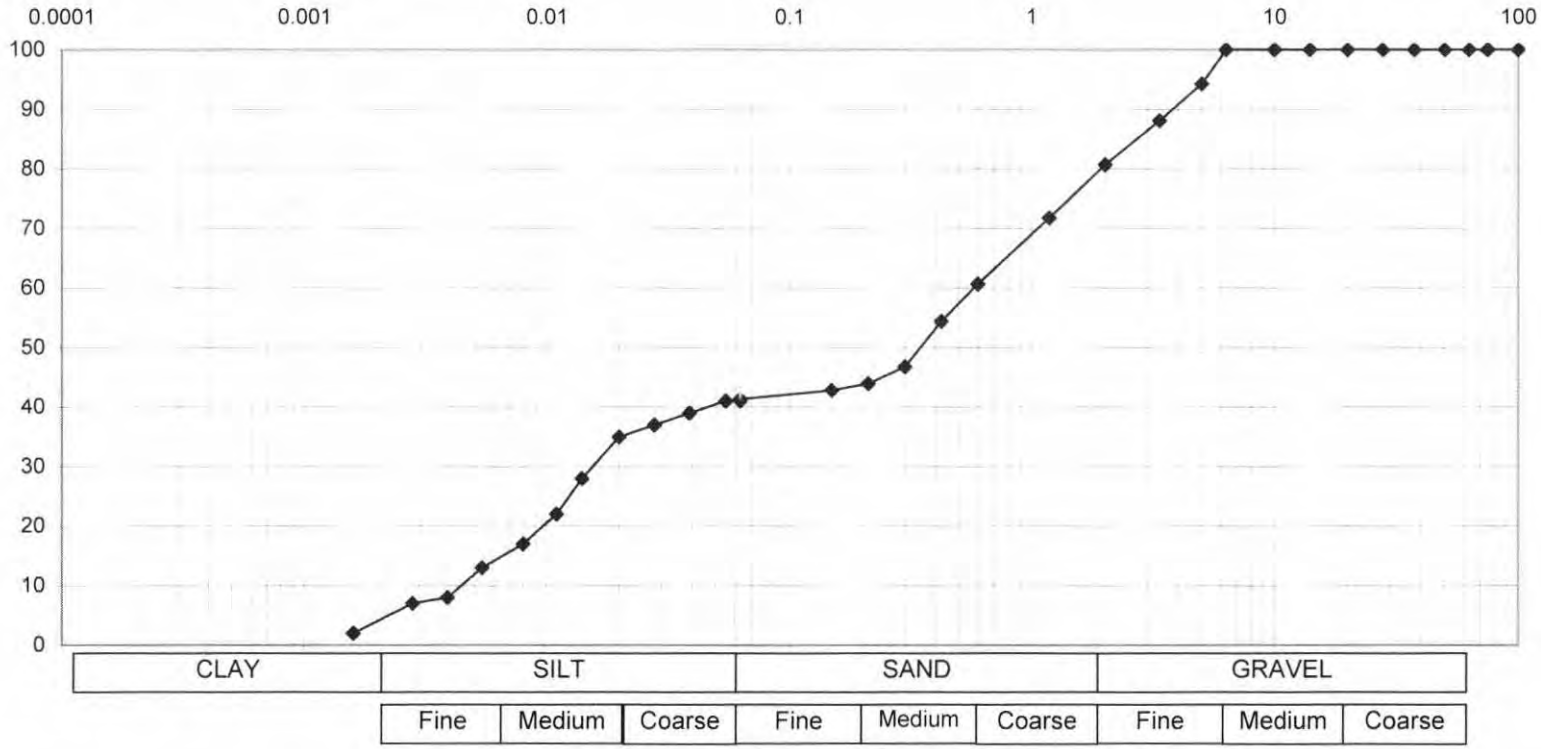
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 932
Depth:	**2.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	94
3.35	88
2	81
1.18	72
0.600	61
0.425	54
0.300	47
0.212	44
0.150	43
0.063	41
0.020	35
0.006	14
0.002	4



Soil Description: **White-grey slightly gravelly sandy SILT.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

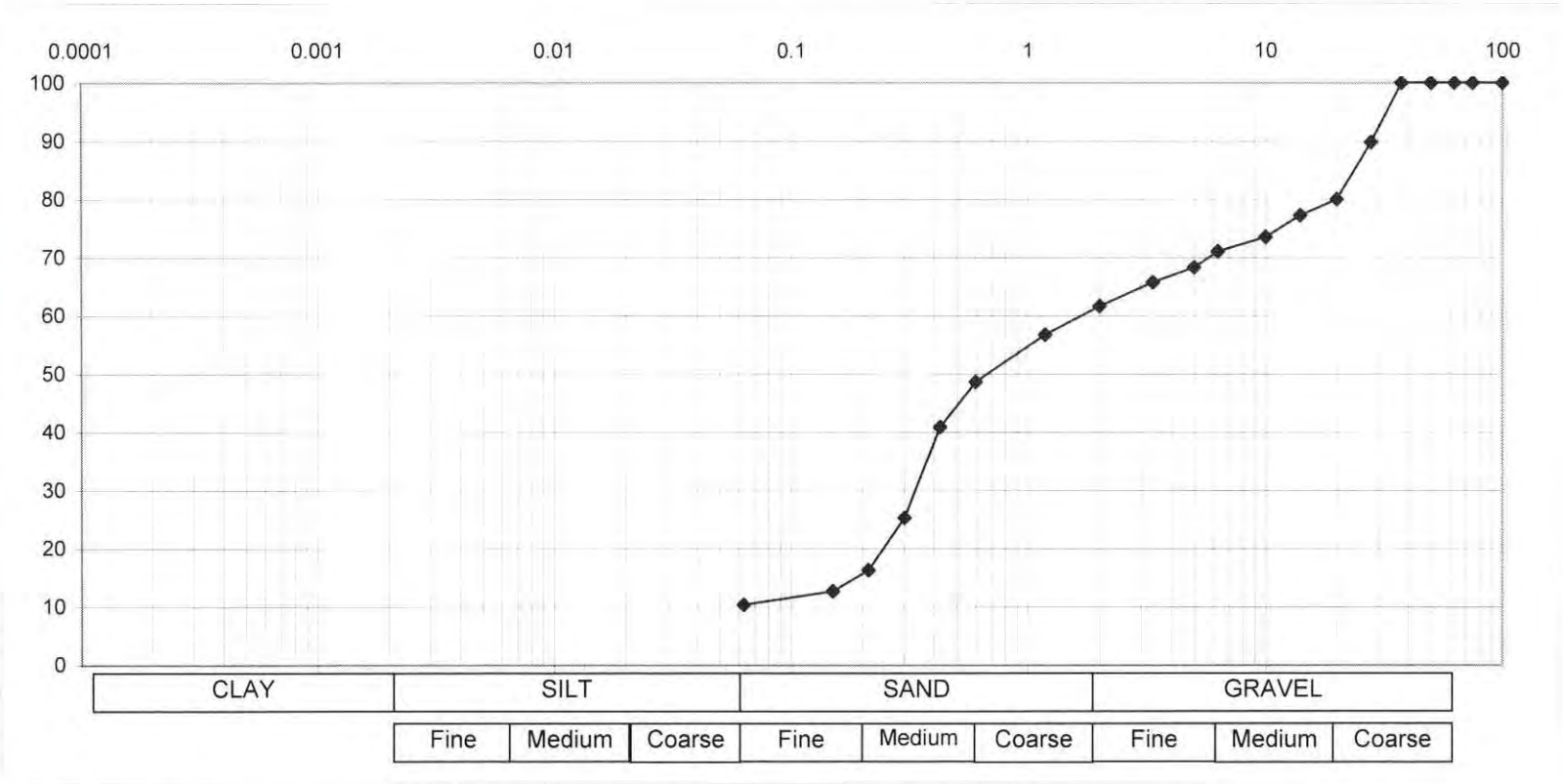
Location
TP 935

Depth: **1.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	90
20	80
14	77
10	74
6.3	71
5	68
3.35	66
2	62
1.18	57
0.600	49
0.425	41
0.300	25
0.212	16
0.150	13
0.063	10
0.020	
0.006	
0.002	



Soil Description: **Grey silty very gravlely medium SAND.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

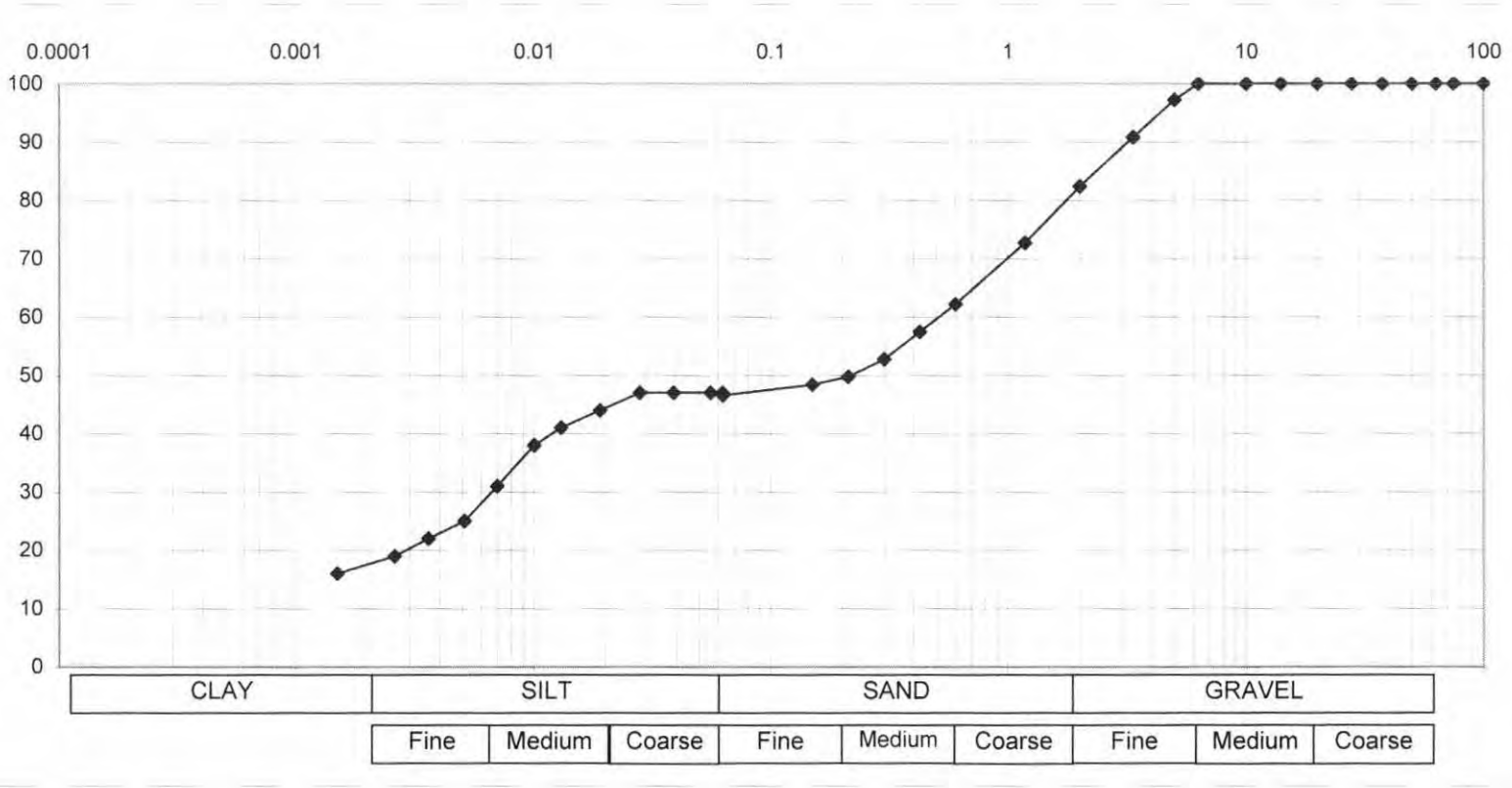
Location
TP 941

Depth: **0.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	97
3.35	91
2	82
1.18	73
0.600	62
0.425	57
0.300	53
0.212	50
0.150	48
0.063	47
0.020	44
0.006	29
0.002	18



Soil Description: **Dark grey slightly gravlely sandy SILT.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

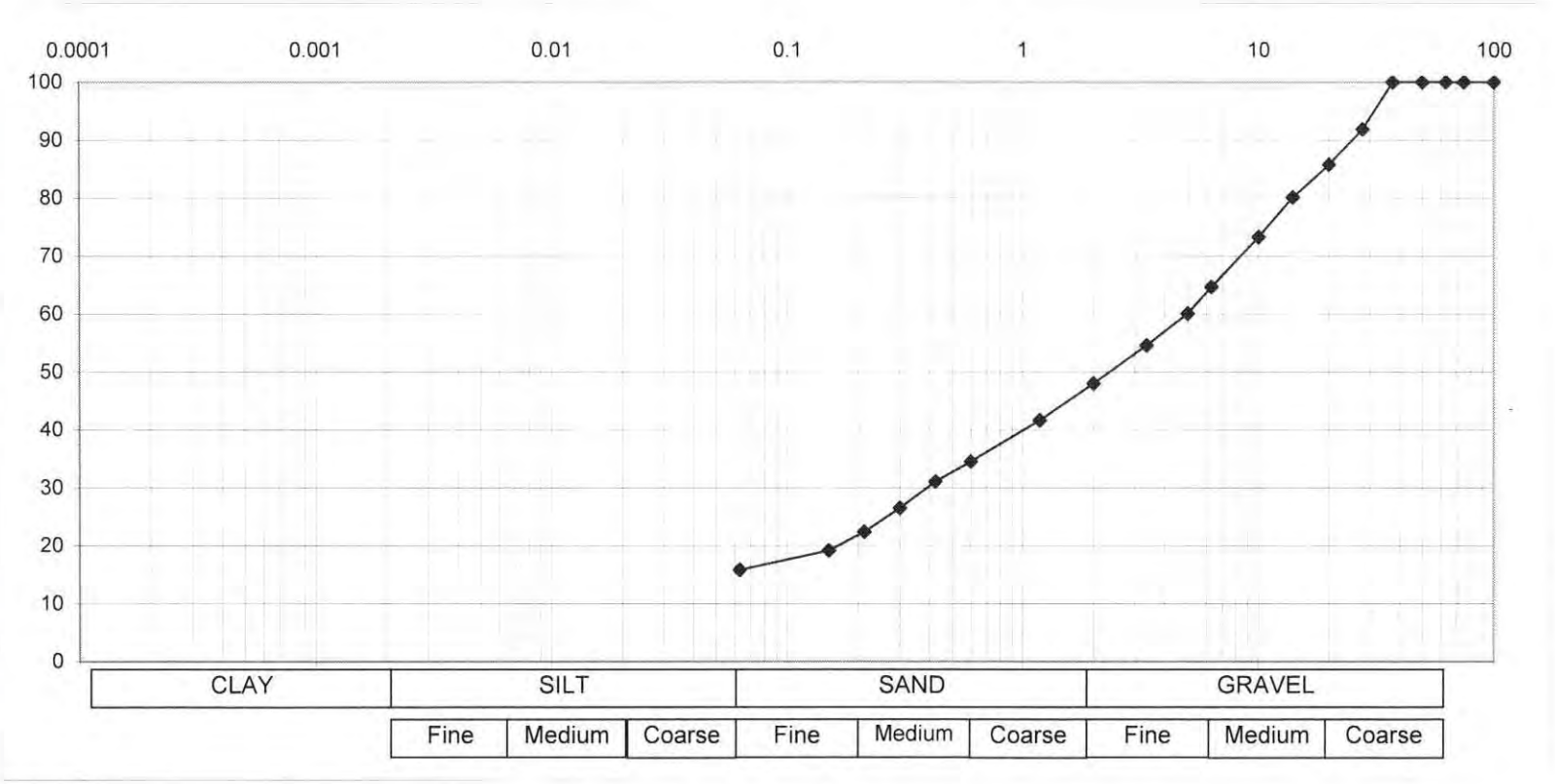
Location
TP 941 A

Depth: **3.0-3.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	92
20	86
14	80
10	73
6.3	65
5	60
3.35	55
2	48
1.18	42
0.600	35
0.425	31
0.300	26
0.212	22
0.150	19
0.063	16
0.020	
0.006	
0.002	



Soil Description: **Brown silty very sandy medium GRAVEL.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

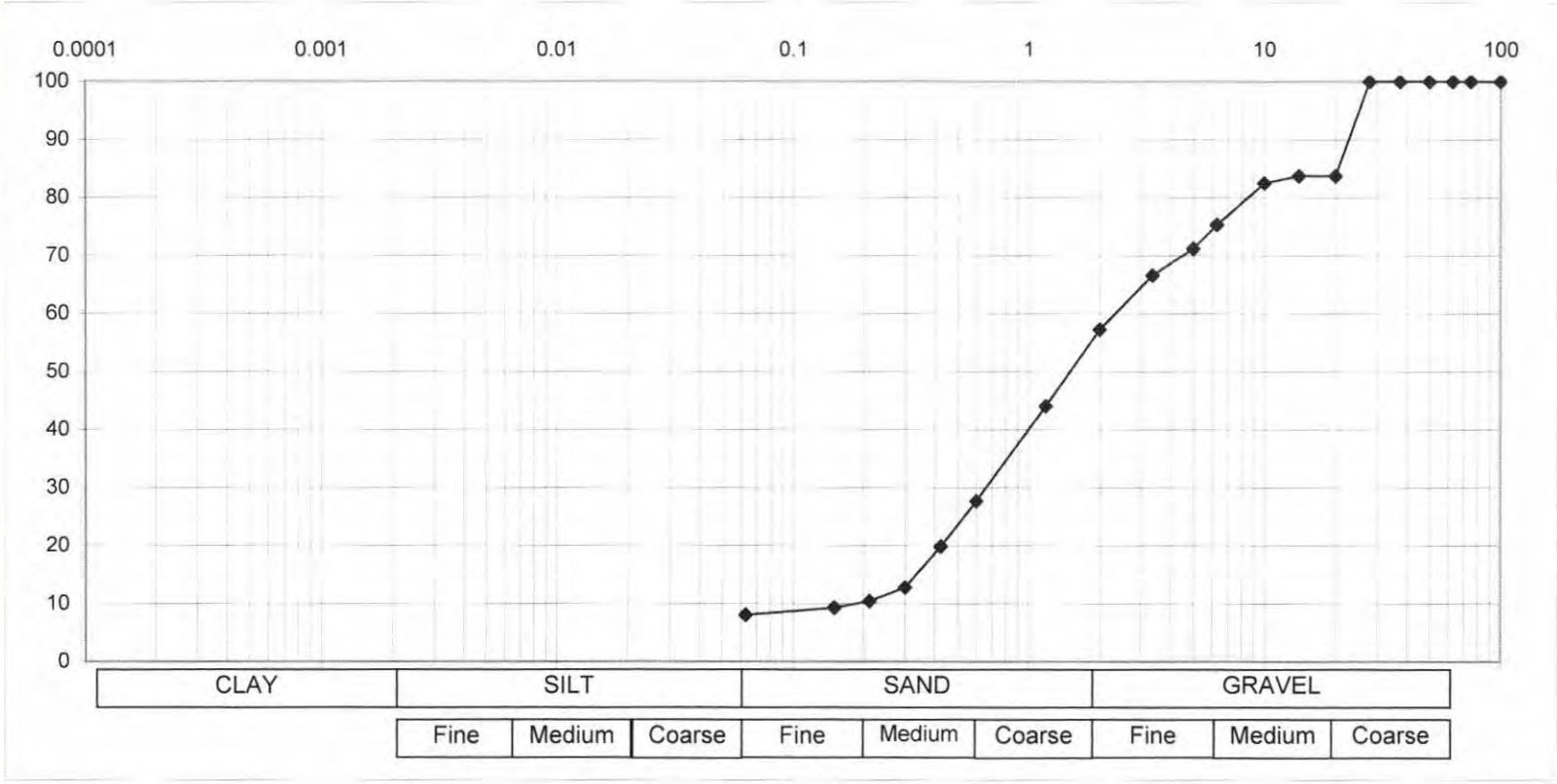
Location
TP 944

Depth: **0.5 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	84
14	84
10	82
6.3	75
5	71
3.35	67
2	57
1.18	44
0.600	28
0.425	20
0.300	13
0.212	10
0.150	9
0.063	8
0.020	
0.006	
0.002	



Soil Description: **Brown silty GRAVEL and SAND.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

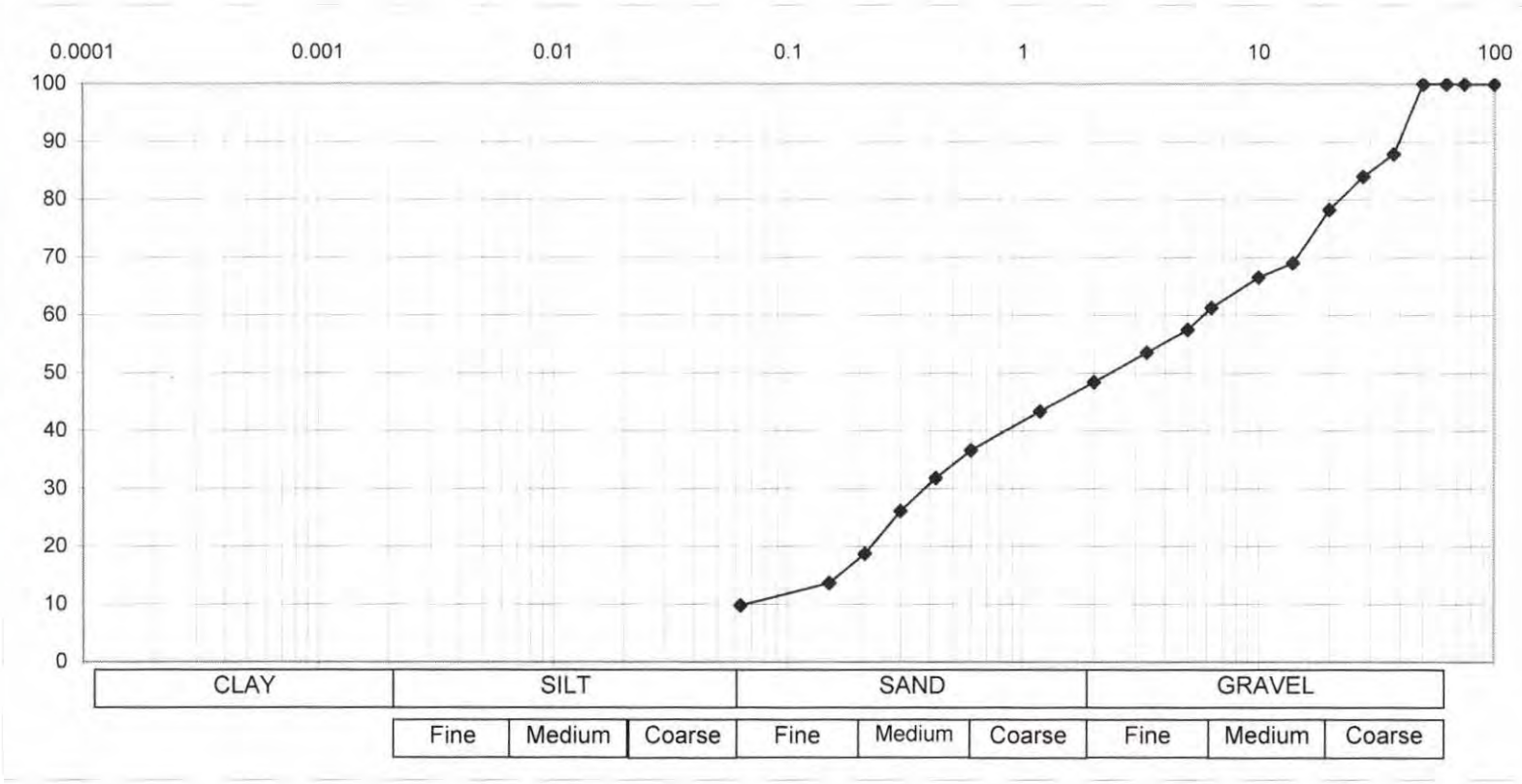
Location
TP 945

Depth: **1.4 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	88
28	84
20	78
14	69
10	67
6.3	61
5	57
3.35	54
2	48
1.18	43
0.600	37
0.425	32
0.300	26
0.212	19
0.150	14
0.063	10
0.020	
0.006	
0.002	



Soil Description: **Grey silty very sandy GRAVEL.**

IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location **TP 951**

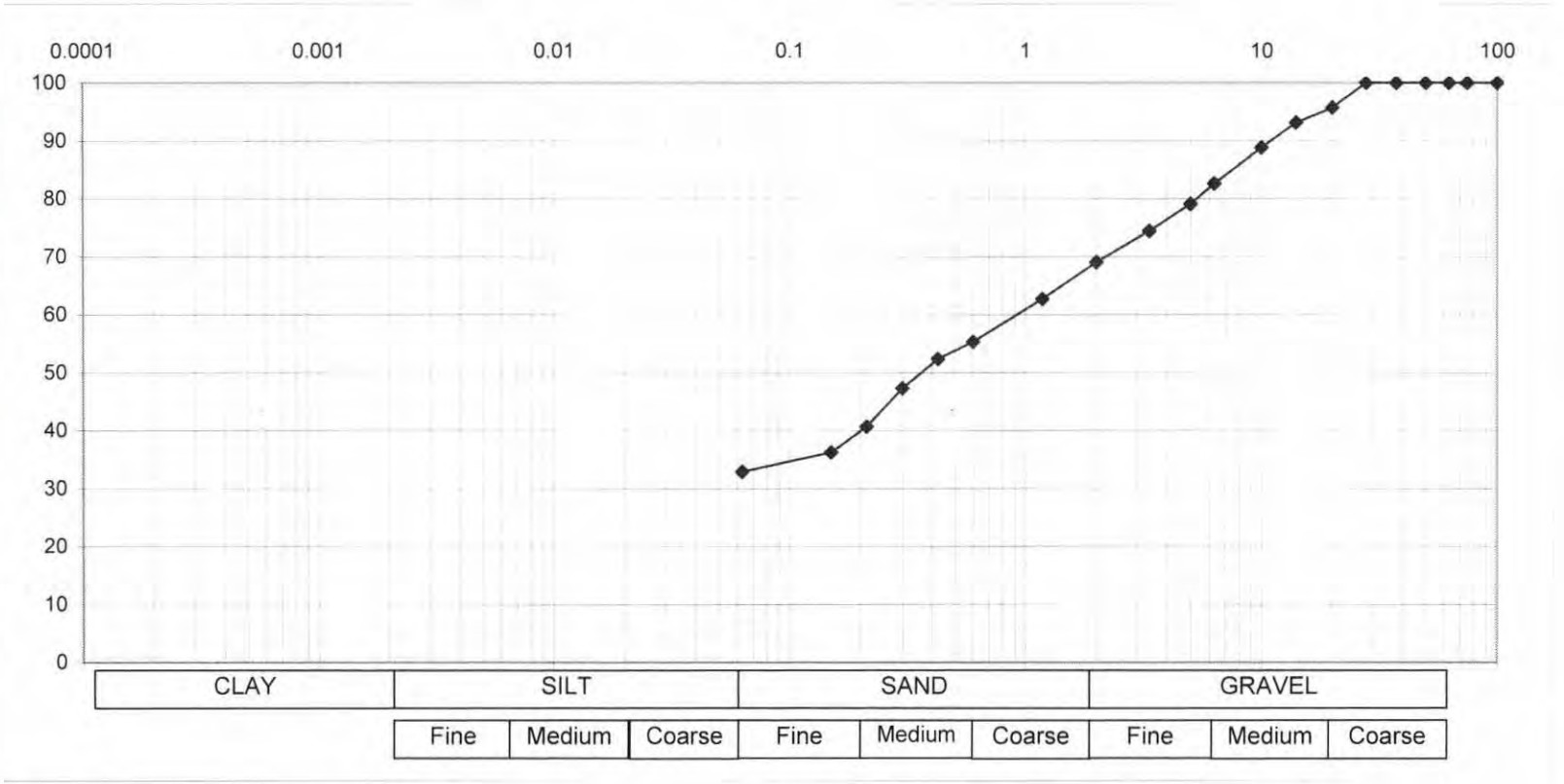
Depth: **1 m**

12/12/2006

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	96
14	93
10	89
6.3	83
5	79
3.35	74
2	69
1.18	63
0.600	55
0.425	52
0.300	47
0.212	41
0.150	36
0.063	33
0.020	
0.006	
0.002	



Soil Description: **Light brown very gravelly very silty medium and coarse SAND.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 23/11/2006 Job Code:
Tested by: DD Checked: DJ

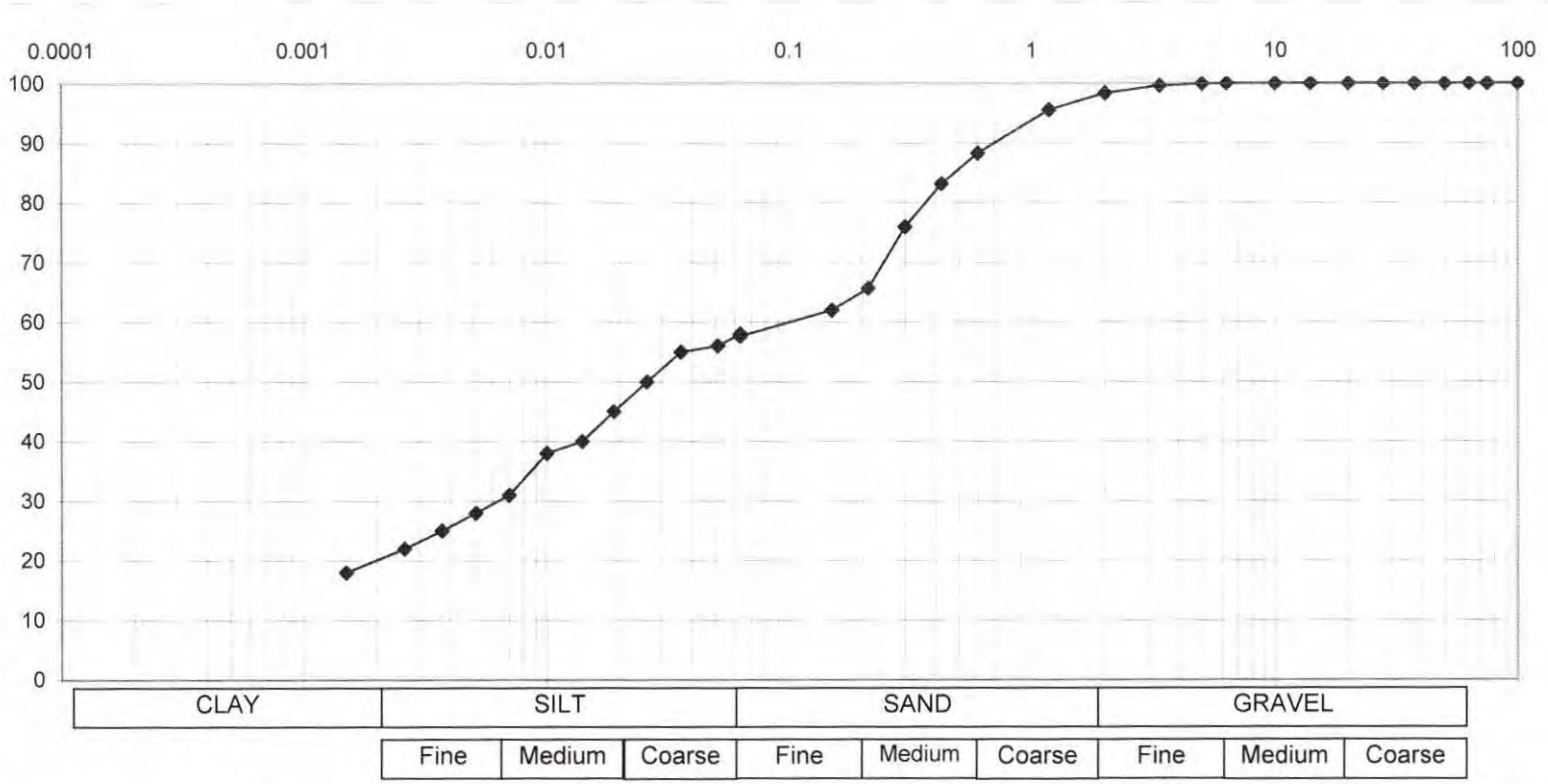
Location **TP 962**

Depth: **0.6 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	98
1.18	96
0.600	88
0.425	83
0.300	76
0.212	66
0.150	62
0.063	58
0.020	45
0.006	30
0.002	20



Soil Description: **Light brown slightly gravelly sandy SILT.**

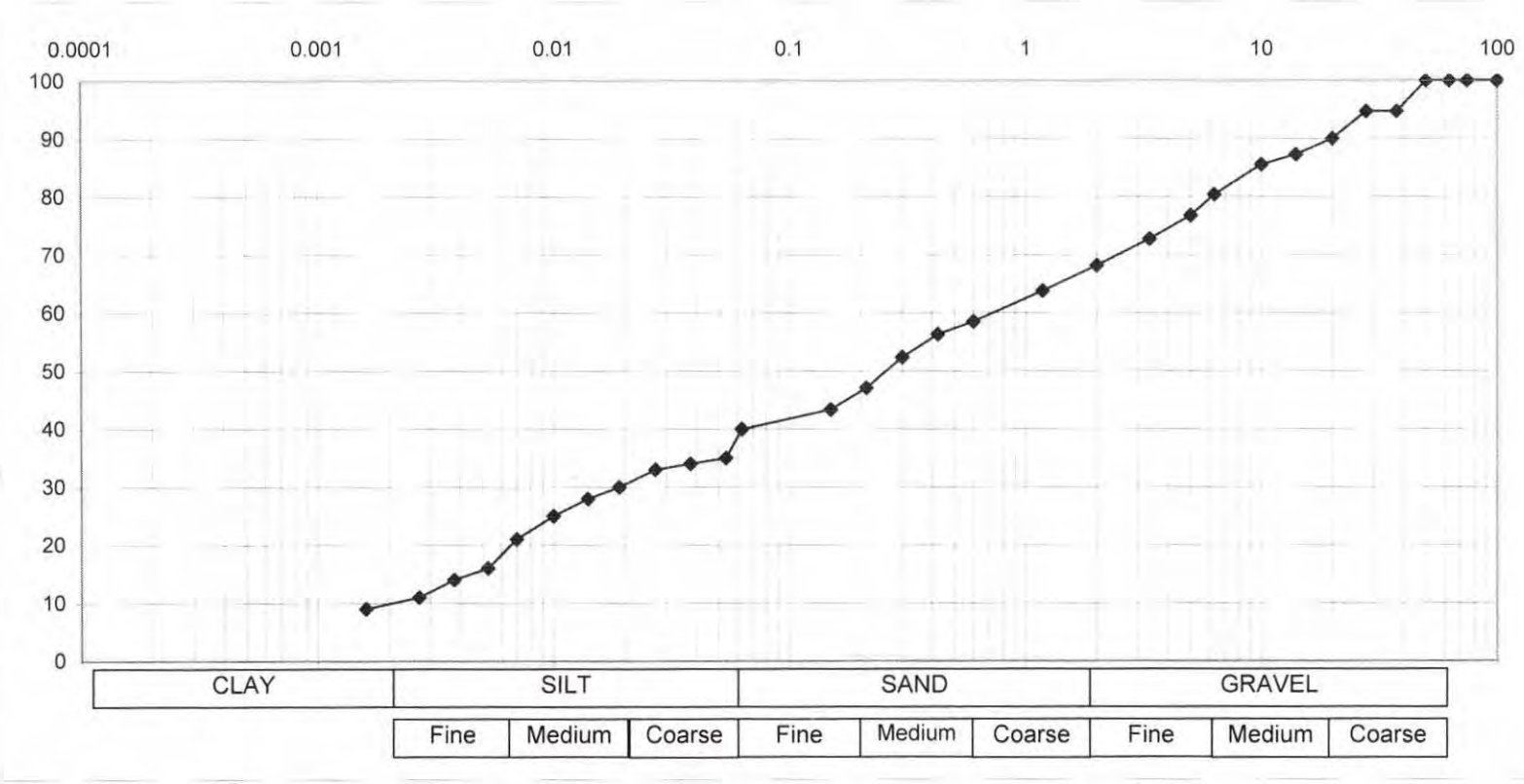
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 969
Depth:	**0.7 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	95
28	95
20	90
14	87
10	86
6.3	80
5	77
3.35	73
2	68
1.18	64
0.600	58
0.425	56
0.300	52
0.212	47
0.150	43
0.063	40
0.020	30
0.006	19
0.002	10



Soil Description: **Brown slightly gravelly slightly sandy SILT.**

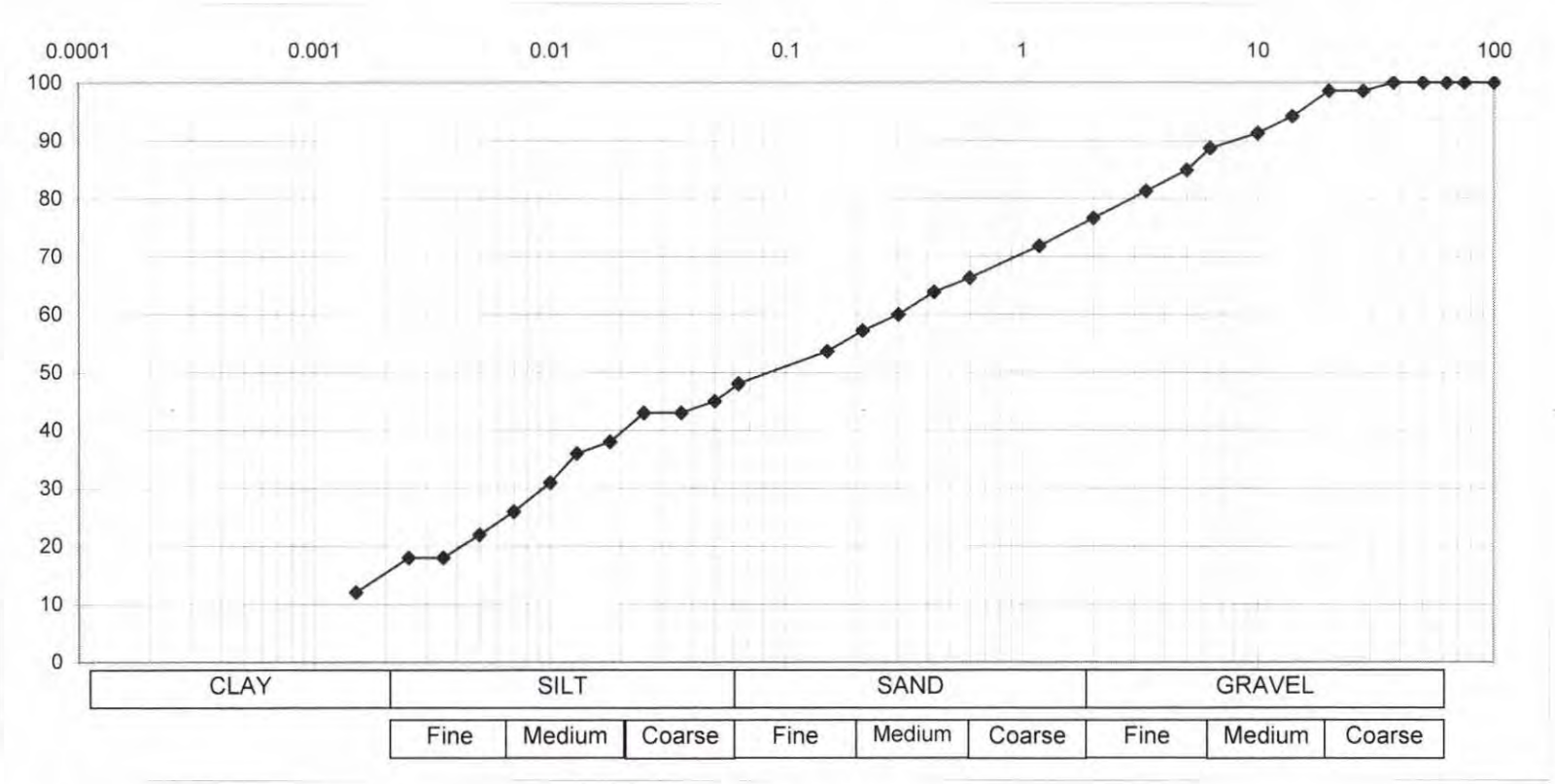
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	23/11/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 971
Depth:	**1 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	99
20	99
14	94
10	91
6.3	89
5	85
3.35	81
2	77
1.18	72
0.600	66
0.425	64
0.300	60
0.212	57
0.150	54
0.063	48
0.020	40
0.006	24
0.002	15



Soil Description: **Grey slightly gravelly slightly sandy SILT.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 26/10/2006 Job Code:
Tested by: DD Checked: DJ

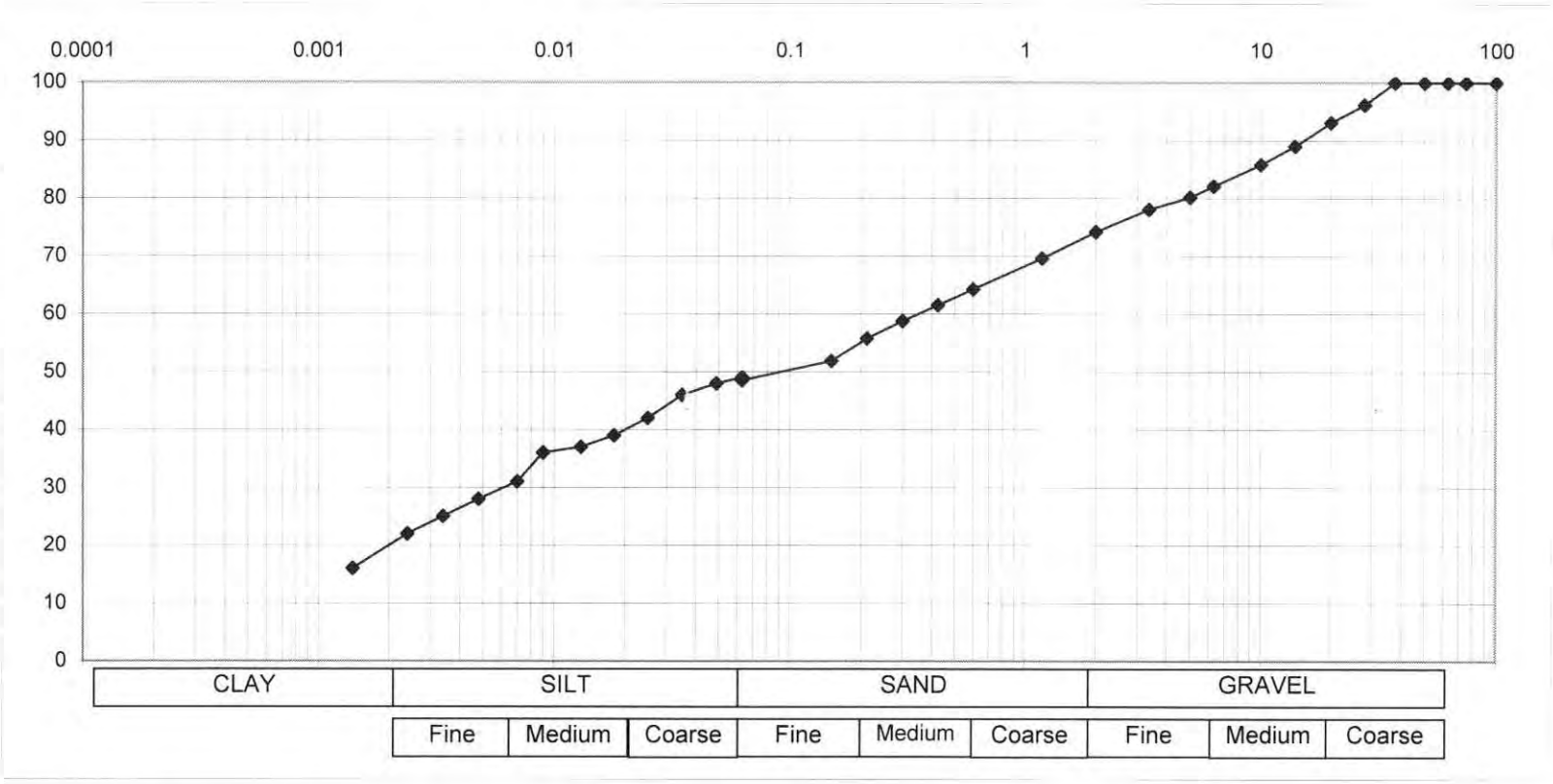
Location **TP 1111**

Depth: **2 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	96
20	93
14	89
10	86
6.3	82
5	80
3.35	78
2	74
1.18	70
0.600	64
0.425	62
0.300	59
0.212	56
0.150	52
0.063	49
0.020	40
0.006	30
0.002	20



Soil Description: **Grey slightly gravelly slightly sandy SILT.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 26/10/2006 Job Code:
Tested by: DD Checked: DJ

Location
TP 1111

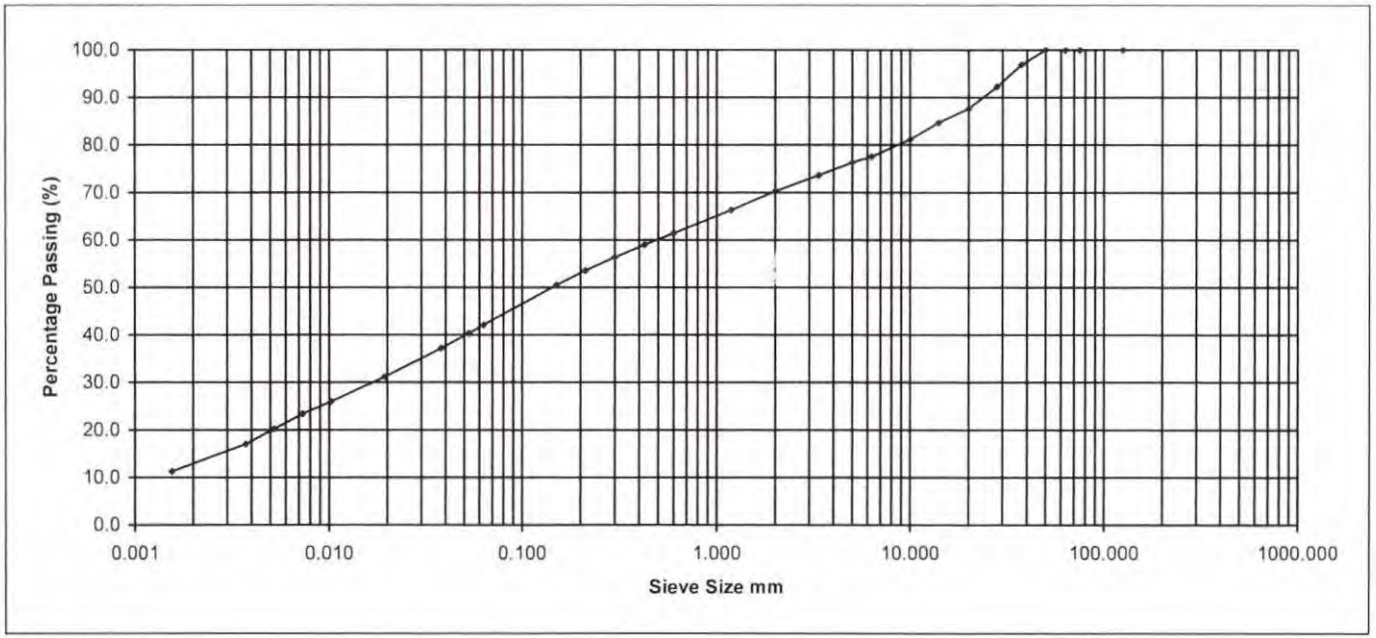
Depth: **4 m**

NMTL Ltd

Determination of Particle Size Distribution

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

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	96.9
28.000	92.2
20.000	87.7
14.000	84.7
10.000	81.2
6.300	77.5
5.000	76.3
3.350	73.6
2.000	70.3
1.180	66.3
0.600	61.4
0.425	58.9
0.300	56.4
0.212	53.6
0.150	50.5
0.063	42.1
0.053	40.4
0.038	37.2
0.019	31.1
0.010	26.0
0.007	23.4
0.005	20.2
0.004	17.0
0.002	11.2



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
11.2		30.9			28.1			29.7		0.0	0.0

Sample Description: Grey sandy gravelly SILT/CLAY..

Project: GCOB Galway County Council

Project No.: NMTL249

Trial Pit No: TP1132

Sample No.: B

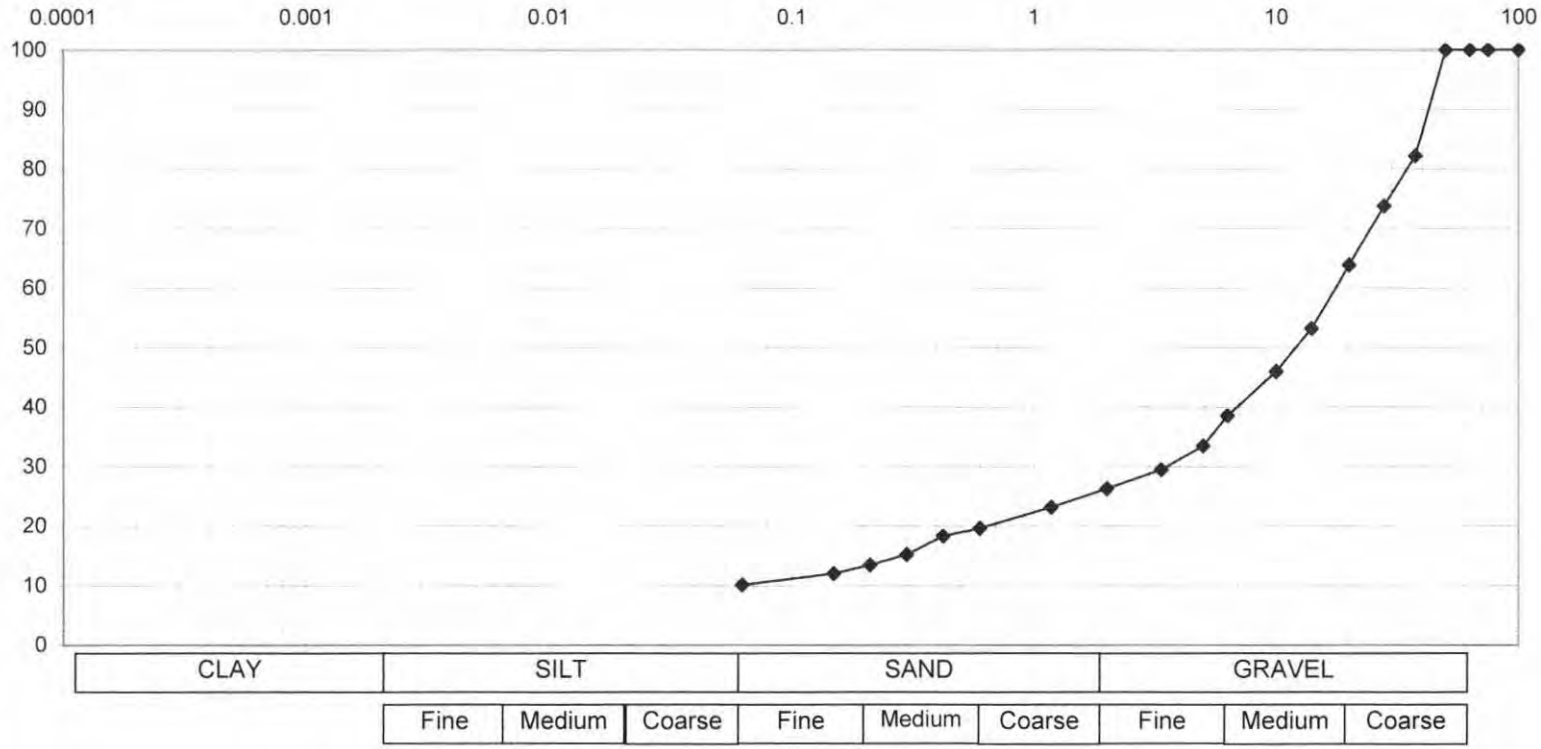
Depth: 1.00m

NMTL Ltd

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	82
28	74
20	64
14	53
10	46
6.3	39
5	33
3.35	29
2	26
1.18	23
0.600	20
0.425	18
0.300	15
0.212	13
0.150	12
0.063	10
0.020	
0.006	
0.002	



Soil Description: **Grey silty sandy medium and coarse GRAVEL, with much PEAT.**

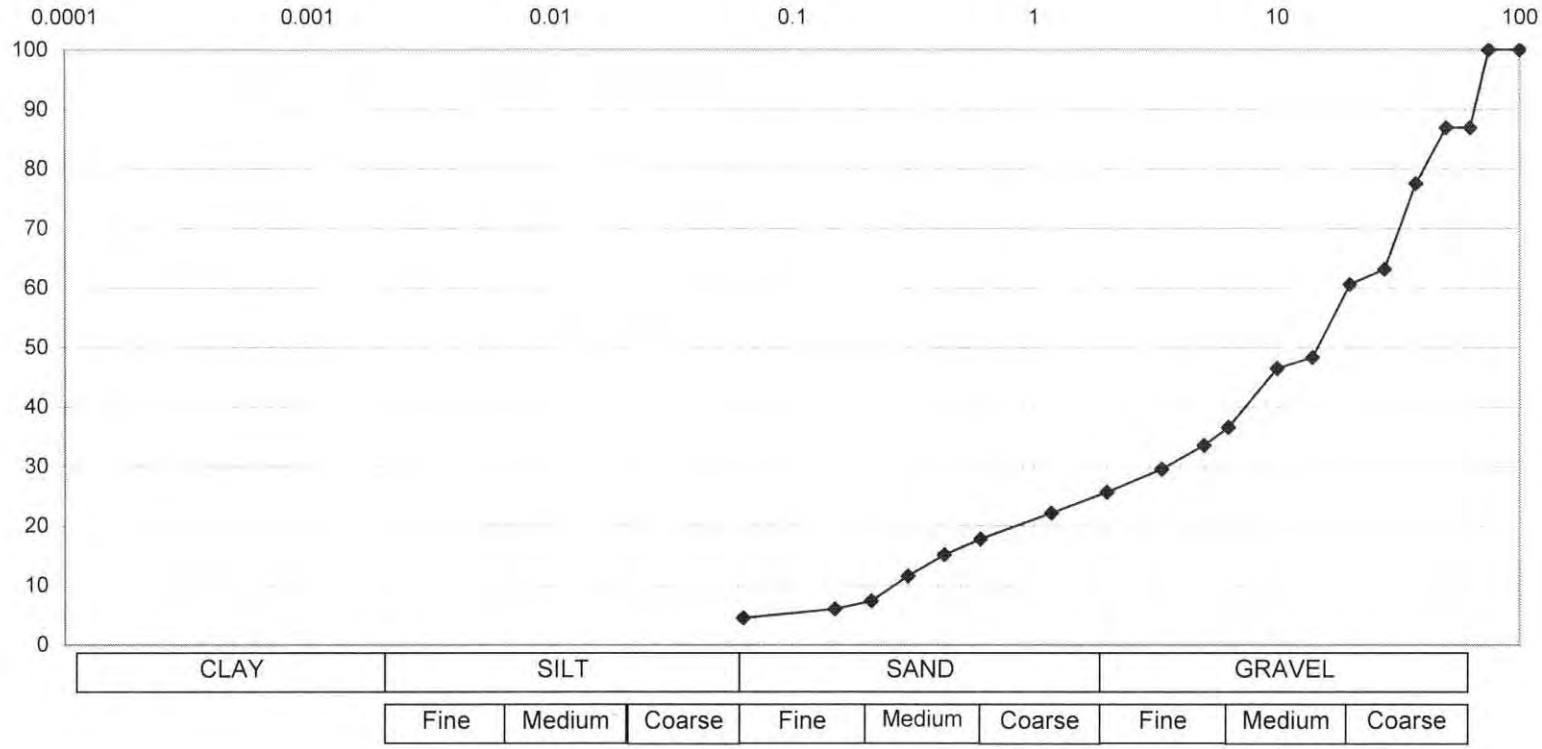
IRISH DRILLING LTD.	Contract:	N6 Galway City Outer Bypass		
Loughrea Co. Galway	Client:			
	Engineer:	John Barnett & Associates		
Tel: (091) 841274	Date:	13/12/2006	Job Code:	
Fax: (091) 847687	Tested by:	DD	Checked:	DJ

Location	
	TP 1430
Depth:	**1.3 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

18/12/2006

Sieve size mm	Percentage passing, %
100	100
75	100
63	87
50	87
37.5	78
28	63
20	61
14	48
10	46
6.3	37
5	34
3.35	30
2	26
1.18	22
0.600	18
0.425	15
0.300	12
0.212	7
0.150	6
0.063	5
0.020	
0.006	
0.002	



Soil Description: **Grey silty very sandy medium and coarse GRAVEL with some cobbles.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 13/12/2006 Job Code:
Tested by: DD Checked: DJ

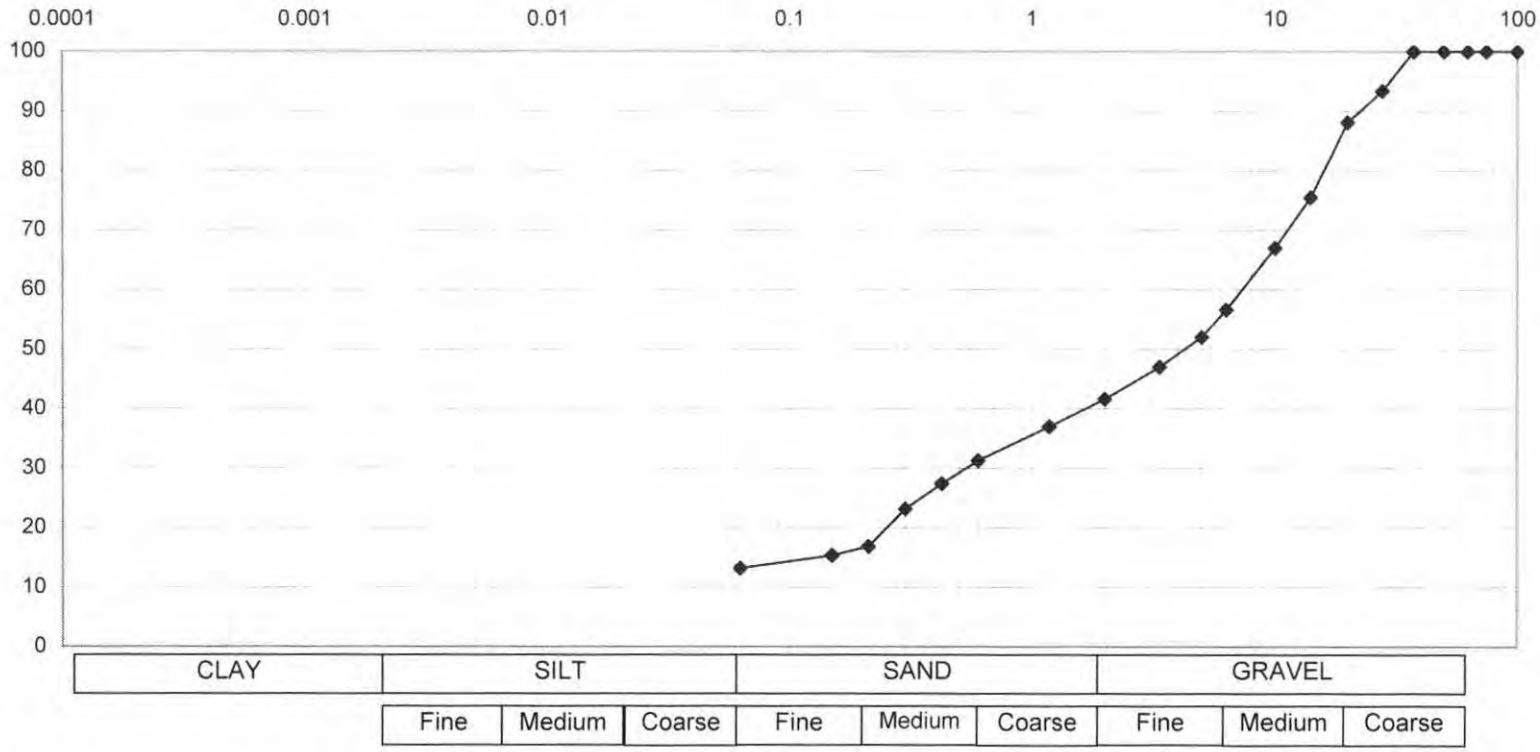
Location
TP 1431

Depth: **1 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

05/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	93
20	88
14	75
10	67
6.3	57
5	52
3.35	47
2	42
1.18	37
0.600	31
0.425	27
0.300	23
0.212	17
0.150	15
0.063	13
0.020	
0.006	
0.002	



Soil Description: **Grey-brown silty very sandy medium GRAVEL.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 02/01/2007 Job Code:
Tested by: DD Checked: DJ

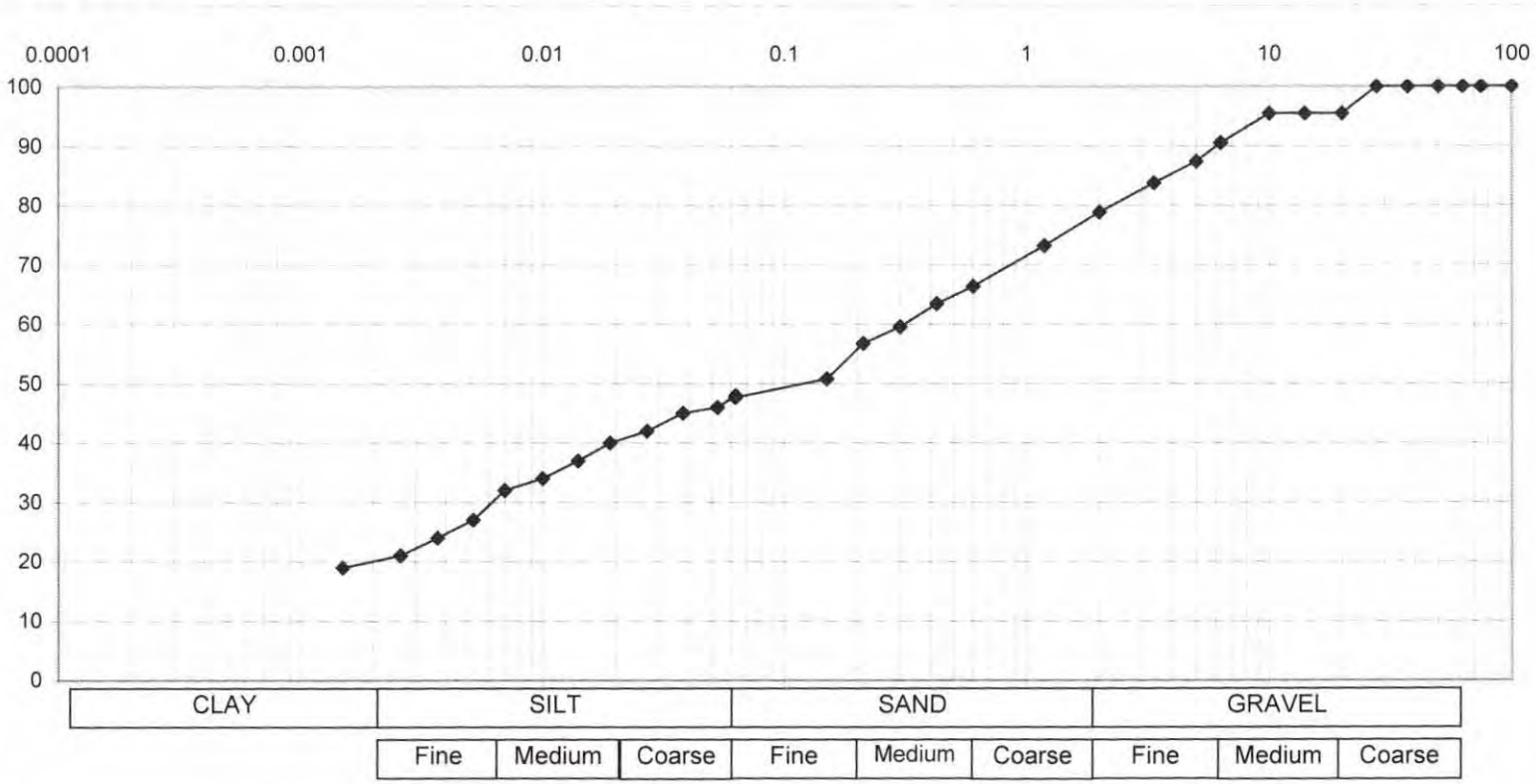
Location
TP 1432

Depth: **1 m**

PARTICLE SIZE DISTRIBUTION
BS 1377: 1990: PART 2 (9.2, 9.5)

12/01/2007

Sieve size mm	Percentage passing, %
100	100
75	100
63	100
50	100
37.5	100
28	100
20	95
14	95
10	95
6.3	90
5	87
3.35	84
2	79
1.18	73
0.600	66
0.425	63
0.300	60
0.212	57
0.150	51
0.063	48
0.020	40
0.006	30
0.002	20



Soil Description: **Grey-brown slightly gravelly slightly sandy SILT.**

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274
Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer: John Barnett & Associates
Date: 15/12/2006 Job Code:
Tested by: DD Checked: DJ

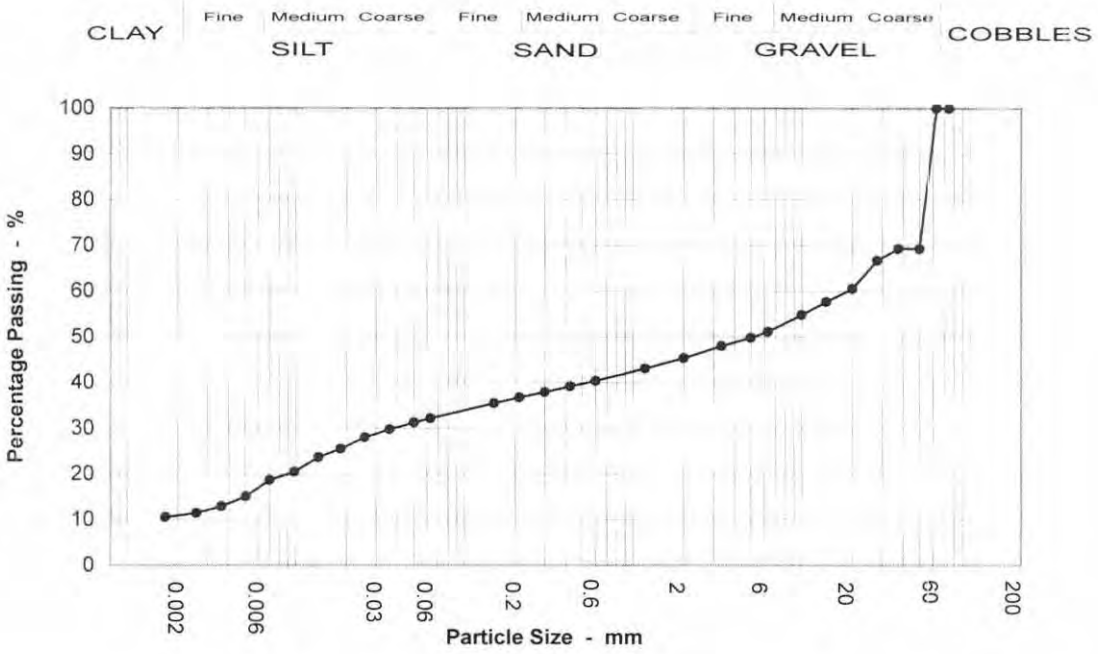
Location **TP 1436**

Depth: **0.95 m**

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	6.00 m
Visual Soil Description	**Grey clayey sandy very silty GRAVEL**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.050	31
63	100	0.036	30
50	69	0.026	28
37.5	69	0.018	25
28	67	0.014	24
20	61	0.010	20
14	58	0.007	19
10	55	0.005	15
6.3	51	0.004	13
5	50	0.003	11
3.35	48	0.002	11
2	45		
1.18	43		
0.6	40		
0.425	39		
0.3	38		
0.212	37		
0.15	35		
0.063	32		

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

Sample Proportions	
Cobbles	0.0
Gravel	54.6
Sand	13.5
Silt	21.0
Clay	10.9

Grading Analysis	
D100	63.0
D60	18.8
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

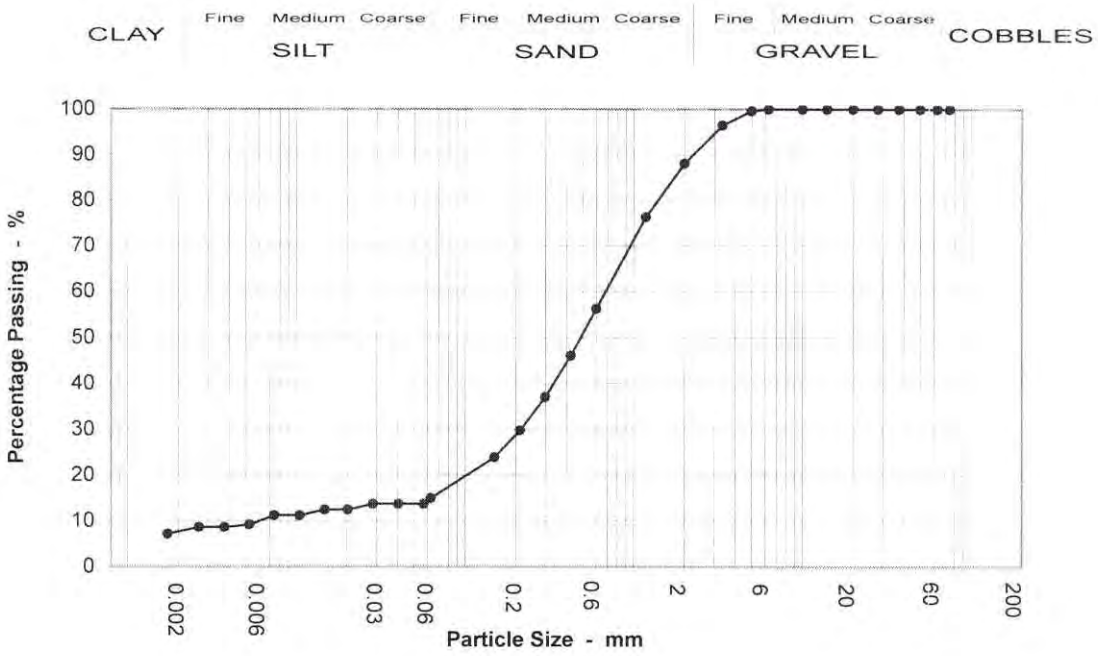
Checked and Approved
Initials: kp
Date: 2/5/2007

All samples connected with this report .incl any on 'hold' will be disposed off according to Company Policy. Acopy of this policy is available on request

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	17.00 m
Visual Soil Description	**Grey silty clayey gravelly SAND**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.057	14
63	100	0.040	14
50	100	0.029	14
37.5	100	0.020	12
28	100	0.015	12
20	100	0.011	11
14	100	0.007	11
10	100	0.005	9
6.3	100	0.004	9
5	100	0.003	9
3.35	96	0.002	7
2	88		
1.18	76		
0.6	56		
0.425	46		
0.3	37		
0.212	30		
0.15	24		
0.063	15		

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

Sample Proportions	
Cobbles	0.0
Gravel	11.9
Sand	73.8
Silt	6.8
Clay	7.5

Grading Analysis	
D100	6.3
D60	0.7
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 2/5/2007

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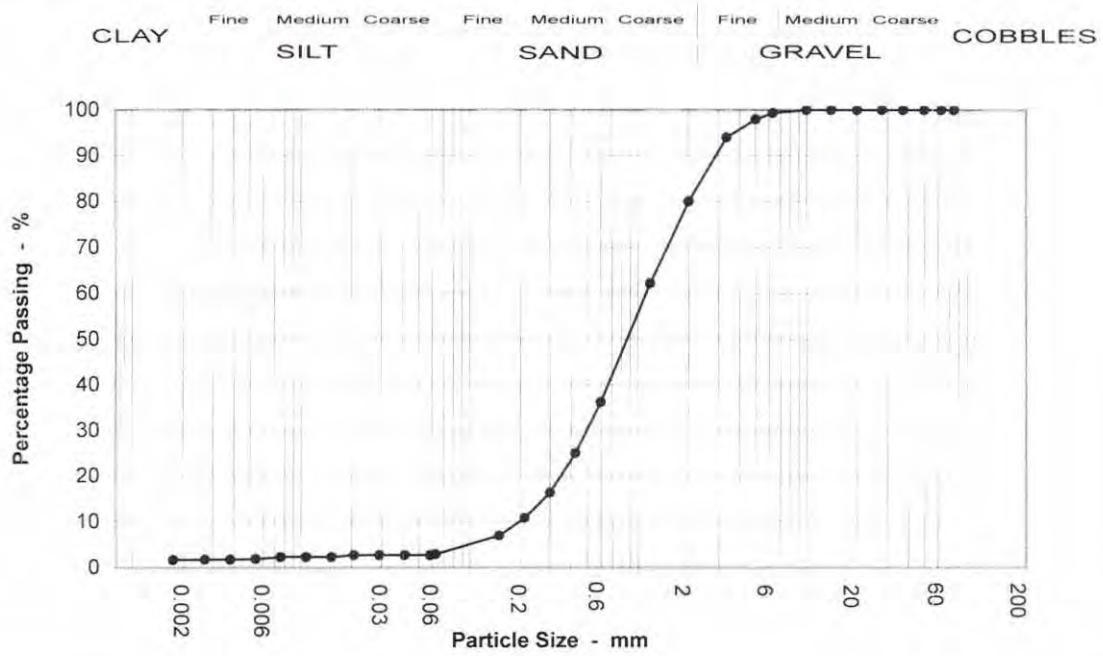
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	24.00 m
Visual Soil Description	**Grey slightly silty slightly clayey gravelly SAND**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.059	3
63	100	0.041	3
50	100	0.029	3
37.5	100	0.021	3
28	100	0.015	2
20	100	0.011	2
14	100	0.008	2
10	100	0.005	2
6.3	99	0.004	2
5	98	0.003	2
3.35	94	0.002	2
2	80		
1.18	62		
0.6	36		
0.425	25		
0.3	16		
0.212	11		
0.15	7		
0.063	3		

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

Sample Proportions	
Cobbles	0.0
Gravel	20.0
Sand	77.2
Silt	1.1
Clay	1.7

Grading Analysis	
D100	10.0
D60	1.1
D10	0.2
Uniformity Coefficient	6

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

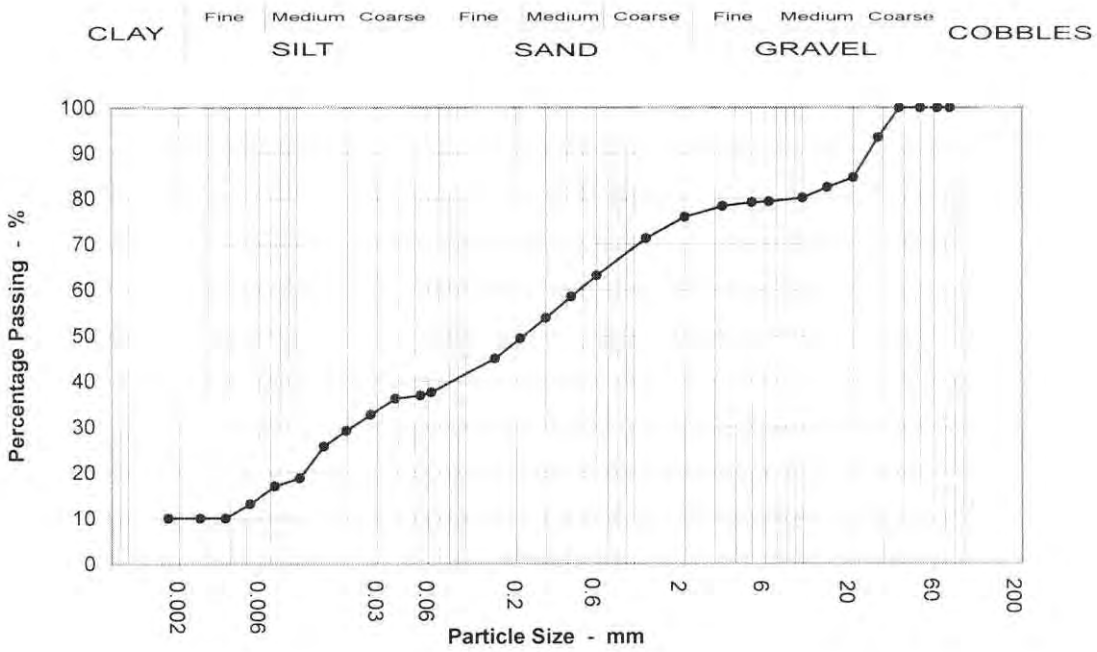
Checked and Approved
Initials: kp
Date: 2/5/2007

All samples connected with this report ,incl any on 'hold' will be disposed off according to Company Policy. Acopy of this policy is available on request

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	34.00 m
Visual Soil Description	**Grey clayey very gravelly very silty SAND**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.054	37
63	100	0.038	36
50	100	0.027	33
37.5	100	0.020	29
28	93	0.014	26
20	85	0.010	19
14	83	0.007	17
10	80	0.005	13
6.3	79	0.004	10
5	79	0.003	10
3.35	78	0.002	10
2	76		
1.18	71		
0.6	63		
0.425	59		
0.3	54		
0.212	49		
0.15	45		
0.063	38		

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

Sample Proportions	
Cobbles	0.0
Gravel	23.9
Sand	38.7
Silt	27.3
Clay	10.1

Grading Analysis	
D100	37.5
D60	0.5
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
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Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

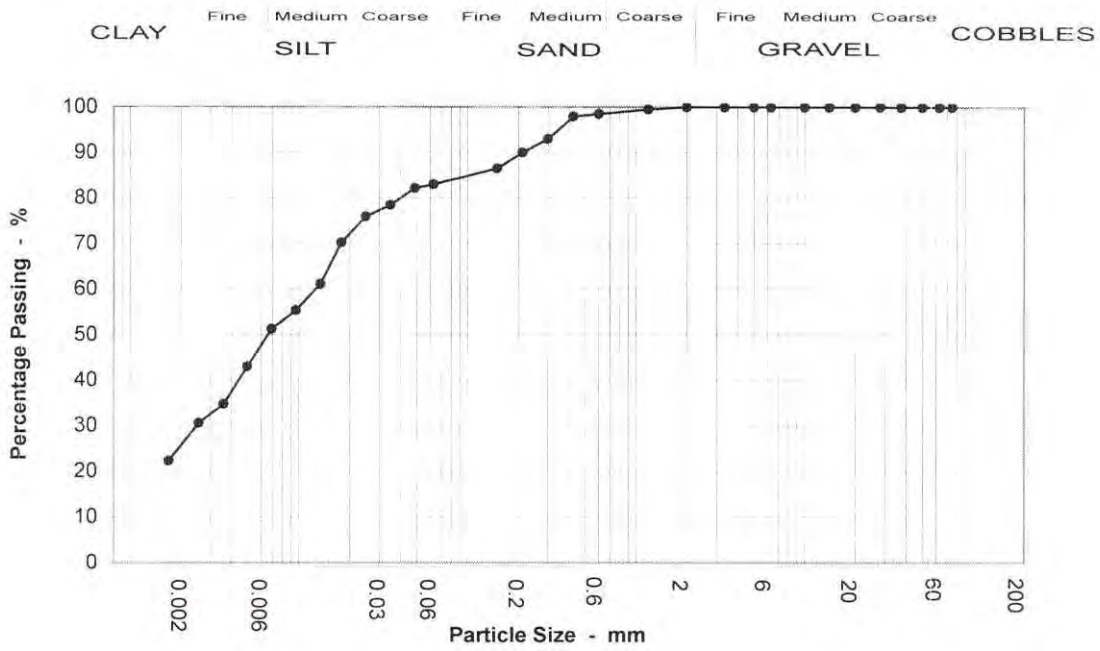
Checked and Approved
Initials: kp
Date: 2/5/2007

All samples connected with this report ,incl any on 'hold' will be disposed off according to Company Policy. Acopy of this policy is available on request

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	40.00 m
Visual Soil Description	**Grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.049	82
63	100	0.035	78
50	100	0.025	76
37.5	100	0.018	70
28	100	0.013	61
20	100	0.010	55
14	100	0.007	51
10	100	0.005	43
6.3	100	0.004	35
5	100	0.003	31
3.35	100	0.002	22
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	93		
0.212	90		
0.15	87		
0.063	83		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	17.2
Silt	57.6
Clay	25.2

Grading Analysis	
D100	2.0
D60	
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

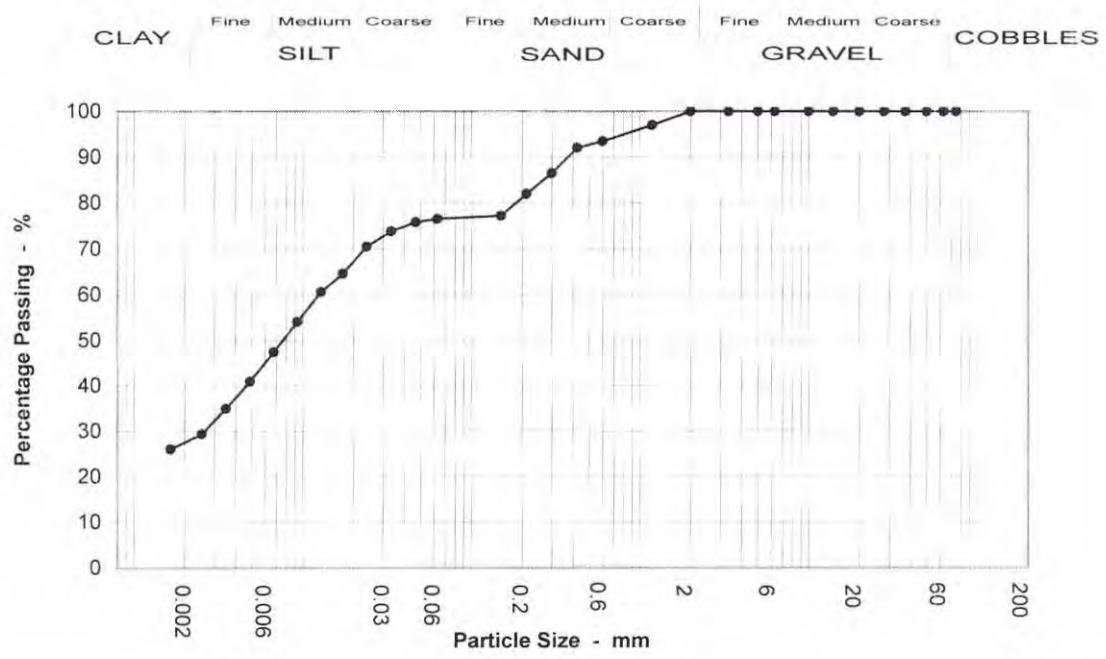
Checked and Approved
Initials: kp
Date: 2/5/2007

All samples connected with this report ,incl any on 'hold' will be disposed off according to Company Policy. Acopy of this policy is available on request

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	46.00 m
Visual Soil Description	**Dark grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.047	76
63	100	0.033	74
50	100	0.024	71
37.5	100	0.017	65
28	100	0.013	61
20	100	0.009	54
14	100	0.007	47
10	100	0.005	41
6.3	100	0.004	35
5	100	0.003	29
3.35	100	0.002	26
2	100		
1.18	97		
0.6	94		
0.425	92		
0.3	87		
0.212	82		
0.15	77		
0.063	77		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	23.6
Silt	49.0
Clay	27.4

Grading Analysis	
D100	2.0
D60	
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
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Checked and Approved
Initials: kp
Date: 2/5/2007

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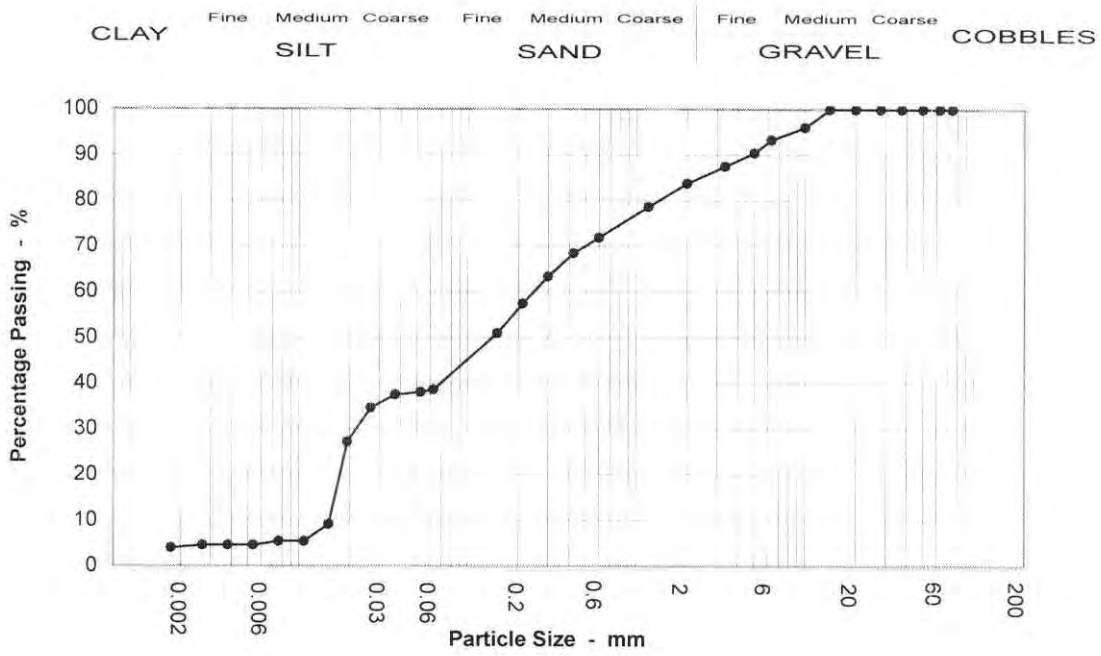
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	51.00 m
Visual Soil Description	**Dark grey slightly gravelly very sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.053	38
63	100	0.037	37
50	100	0.027	35
37.5	100	0.019	27
28	100	0.015	9
20	100	0.011	5
14	100	0.008	5
10	96	0.005	5
6.3	93	0.004	5
5	90	0.003	5
3.35	88	0.002	4
2	84		
1.18	79		
0.6	72		
0.425	68		
0.3	63		
0.212	57		
0.15	51		
0.063	39		

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

Sample Proportions	
Cobbles	0.0
Gravel	16.2
Sand	45.4
Silt	34.3
Clay	4.1

Grading Analysis	
D100	14.0
D60	0.3
D10	
Uniformity Coefficient	N/A

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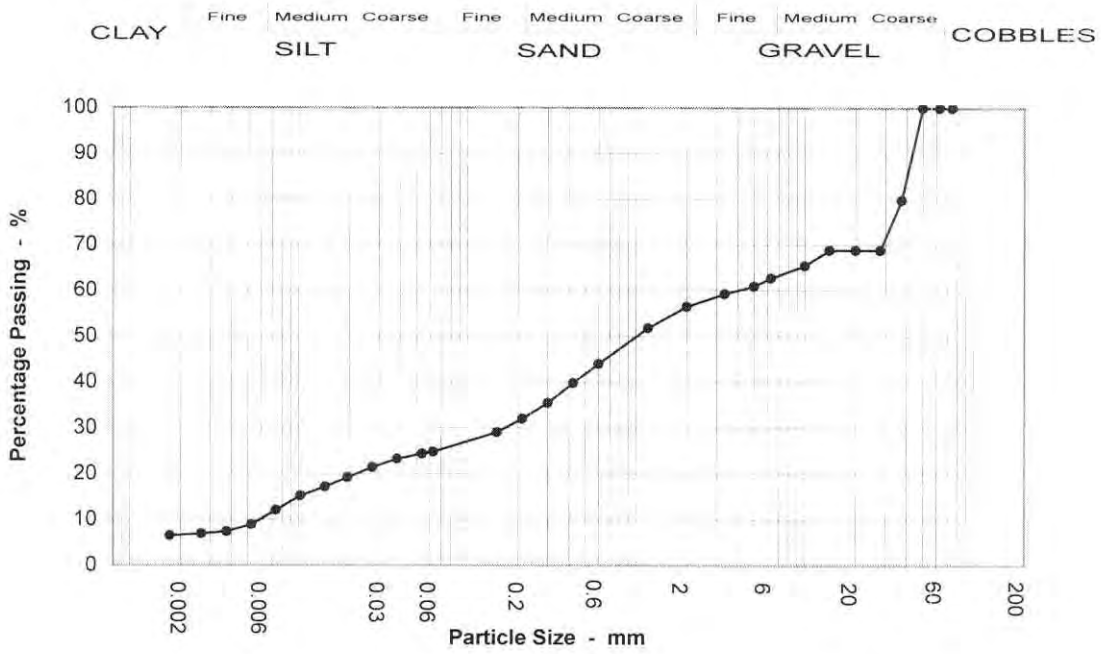
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC936
Location	**GCOB**	Sample No	
		Depth	55.50 m
Visual Soil Description	**Grey clayey silty very sandy GRAVEL**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.054	24
63	100	0.038	23
50	100	0.027	21
37.5	80	0.020	19
28	69	0.014	17
20	69	0.010	15
14	69	0.007	12
10	66	0.005	9
6.3	63	0.004	7
5	61	0.003	7
3.35	59	0.002	6
2	56		
1.18	52		
0.6	44		
0.425	40		
0.3	35		
0.212	32		
0.15	29		
0.063	25		

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

Sample Proportions	
Cobbles	0.0
Gravel	43.5
Sand	31.8
Silt	18.1
Clay	6.6

Grading Analysis	
D100	50.0
D60	4.1
D10	
Uniformity Coefficient	N/A

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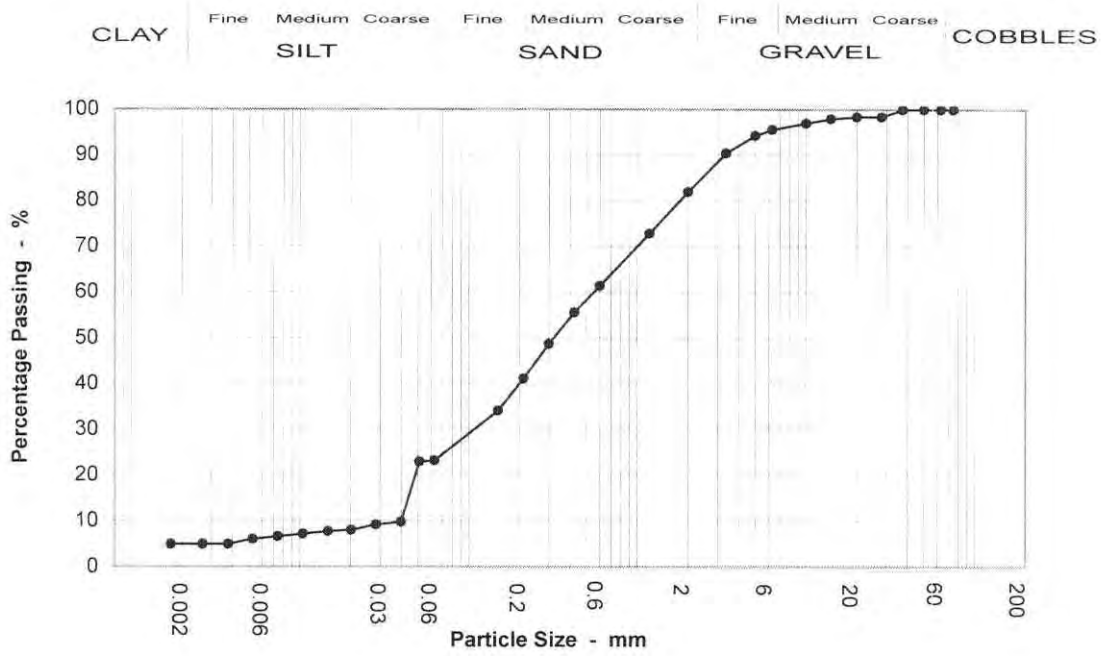
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	9.00 m
Visual Soil Description	**Grey slightly clayey silty gravelly SAND**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.051	23
63	100	0.040	10
50	100	0.028	9
37.5	100	0.020	8
28	98	0.015	8
20	98	0.010	7
14	98	0.007	7
10	97	0.005	6
6.3	96	0.004	5
5	94	0.003	5
3.35	90	0.002	5
2	82		
1.18	73		
0.6	61		
0.425	56		
0.3	49		
0.212	41		
0.15	34		
0.063	23		

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

Sample Proportions	
Cobbles	0.0
Gravel	18.1
Sand	58.8
Silt	18.2
Clay	4.9

Grading Analysis	
D100	37.5
D60	0.6
D10	
Uniformity Coefficient	N/A

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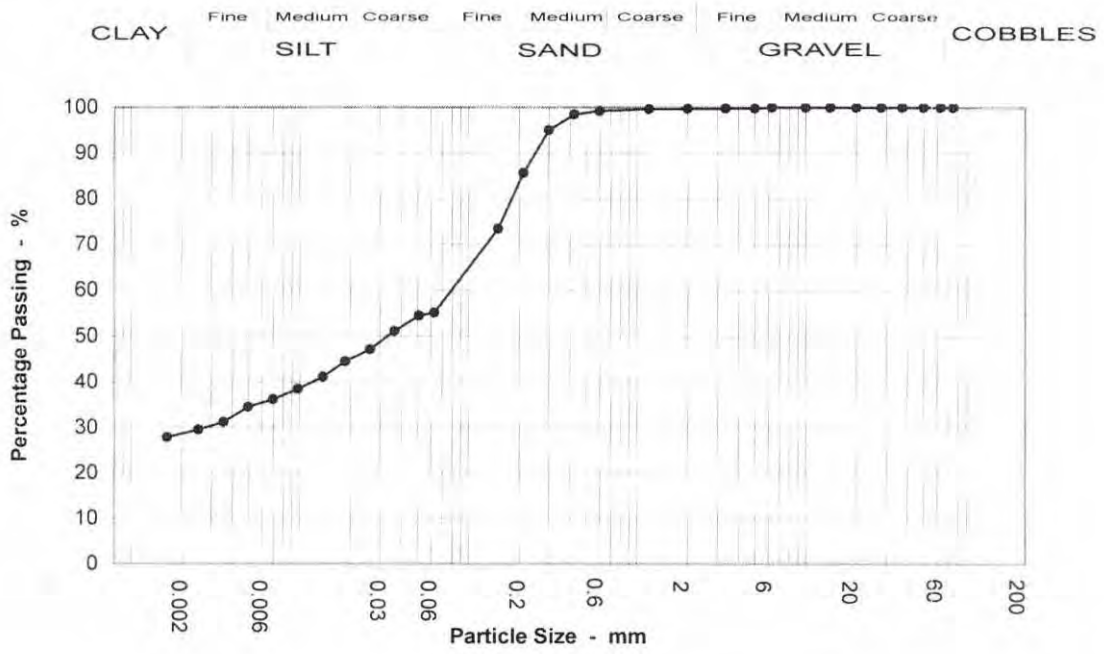
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	11.00 m
Visual Soil Description	**Dark grey very sandy silty CLAY**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.051	54
63	100	0.036	51
50	100	0.026	47
37.5	100	0.019	45
28	100	0.014	41
20	100	0.010	39
14	100	0.007	36
10	100	0.005	35
6.3	100	0.004	31
5	100	0.003	30
3.35	100	0.002	28
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	95		
0.212	86		
0.15	73		
0.063	55		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.3
Sand	44.8
Silt	26.4
Clay	28.6

Grading Analysis	
D100	6.3
D60	0.1
D10	
Uniformity Coefficient	N/A

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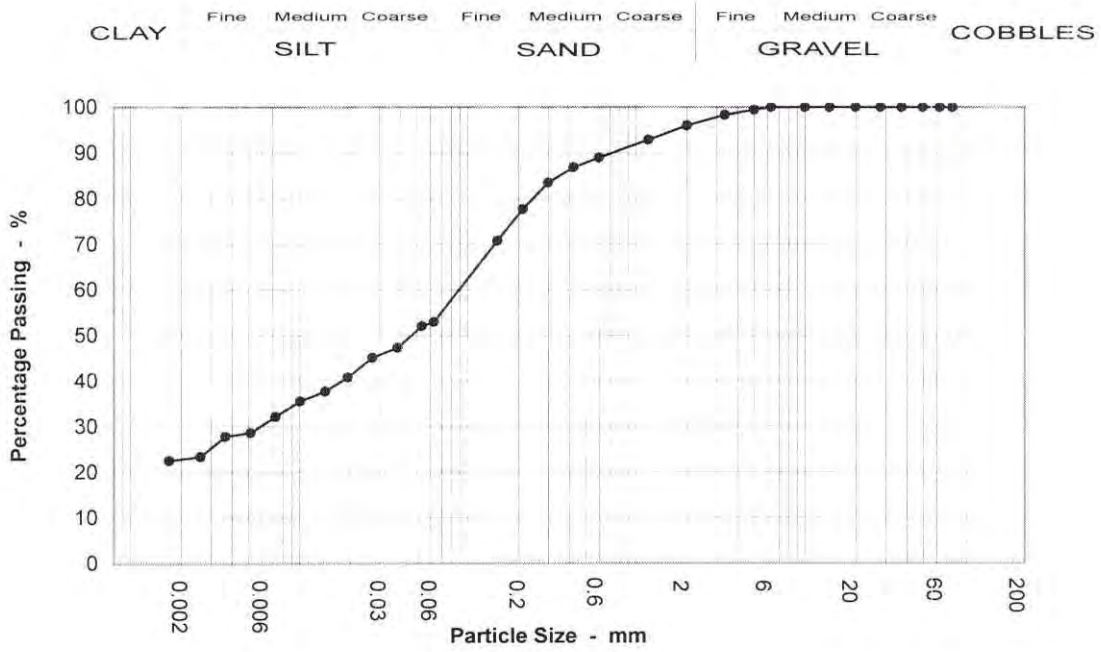
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	16.00 m
Visual Soil Description	**Dark grey slightly gravelly very sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.054	52
63	100	0.038	47
50	100	0.027	45
37.5	100	0.019	41
28	100	0.014	38
20	100	0.010	36
14	100	0.007	32
10	100	0.005	29
6.3	100	0.004	28
5	99	0.003	23
3.35	98	0.002	23
2	96		
1.18	93		
0.6	89		
0.425	87		
0.3	84		
0.212	78		
0.15	71		
0.063	53		

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

Sample Proportions	
Cobbles	0.0
Gravel	4.0
Sand	43.3
Silt	29.8
Clay	22.9

Grading Analysis	
D100	6.3
D60	0.1
D10	
Uniformity Coefficient	N/A

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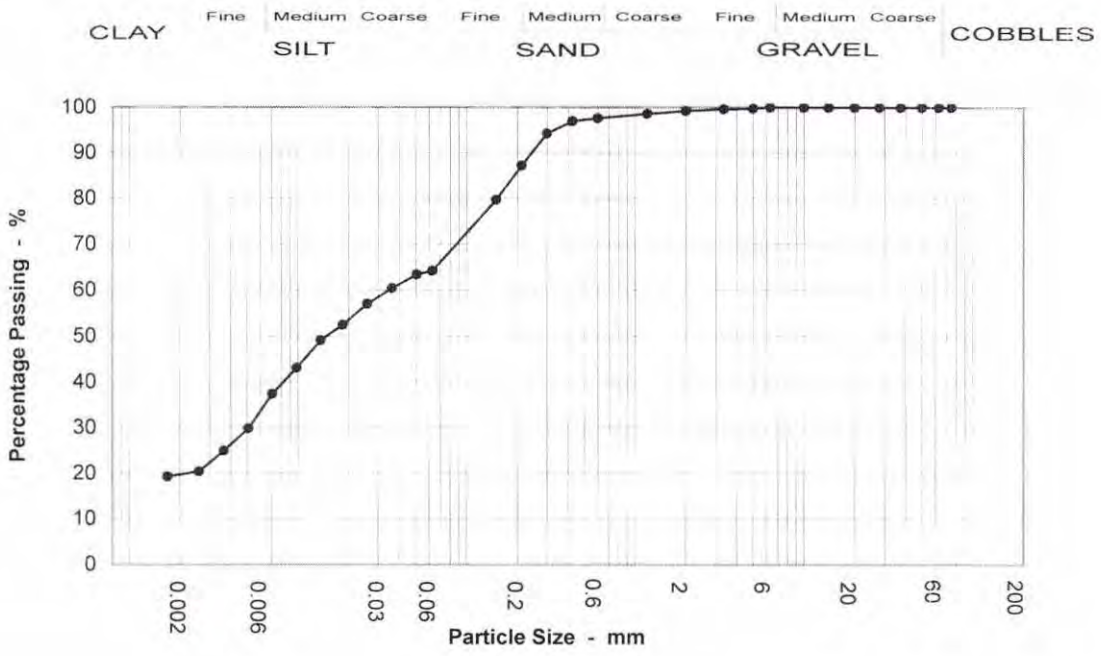
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	19.00 m
Visual Soil Description	**Dark grey slightly gravelly very sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.051	63
63	100	0.036	60
50	100	0.026	57
37.5	100	0.019	53
28	100	0.014	49
20	100	0.010	43
14	100	0.007	37
10	100	0.005	30
6.3	100	0.004	25
5	100	0.003	20
3.35	100	0.002	19
2	99		
1.18	99		
0.6	98		
0.425	97		
0.3	94		
0.212	87		
0.15	80		
0.063	64		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.8
Sand	35.2
Silt	44.4
Clay	19.6

Grading Analysis	
D100	6.3
D60	
D10	
Uniformity Coefficient	N/A

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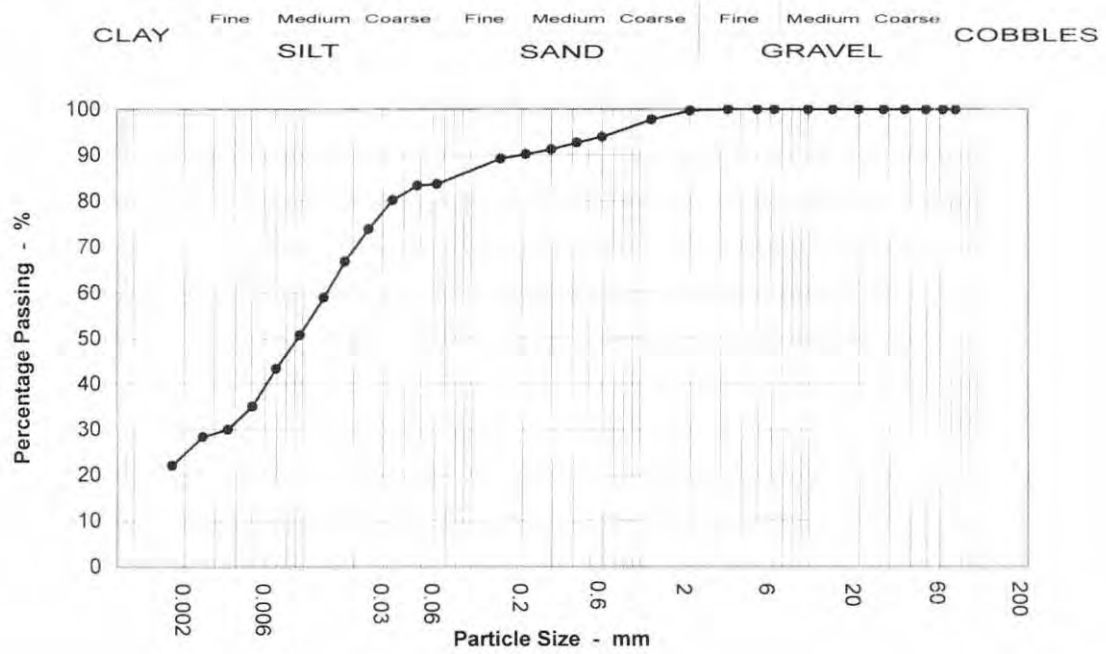
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	26.00 m
Visual Soil Description	**Dark grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.048	83
63	100	0.034	80
50	100	0.025	74
37.5	100	0.018	67
28	100	0.013	59
20	100	0.010	51
14	100	0.007	43
10	100	0.005	35
6.3	100	0.004	30
5	100	0.003	28
3.35	100	0.002	22
2	100		
1.18	98		
0.6	94		
0.425	93		
0.3	91		
0.212	90		
0.15	89		
0.063	84		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.3
Sand	16.1
Silt	59.4
Clay	24.2

Grading Analysis	
D100	3.4
D60	
D10	
Uniformity Coefficient	N/A

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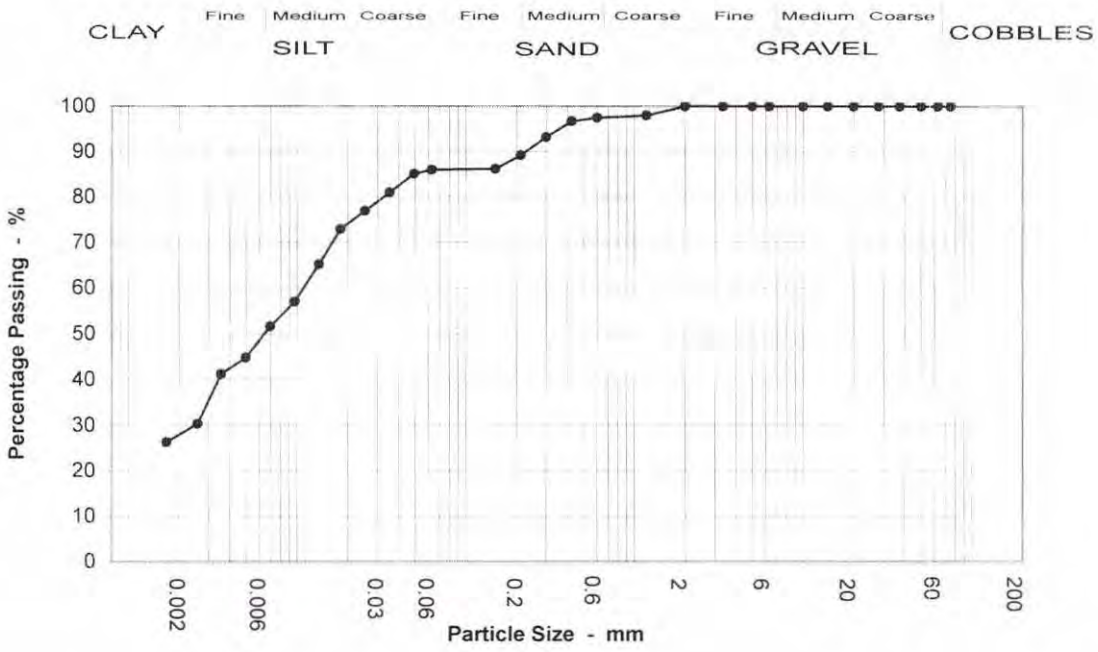
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	32.00 m
Visual Soil Description	**Dark grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.050	85
63	100	0.035	81
50	100	0.025	77
37.5	100	0.018	73
28	100	0.013	65
20	100	0.010	57
14	100	0.007	52
10	100	0.005	45
6.3	100	0.004	41
5	100	0.003	30
3.35	100	0.002	26
2	100		
1.18	98		
0.6	98		
0.425	97		
0.3	93		
0.212	89		
0.15	86		
0.063	86		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	14.2
Silt	58.1
Clay	27.7

Grading Analysis	
D100	2.0
D60	
D10	
Uniformity Coefficient	N/A

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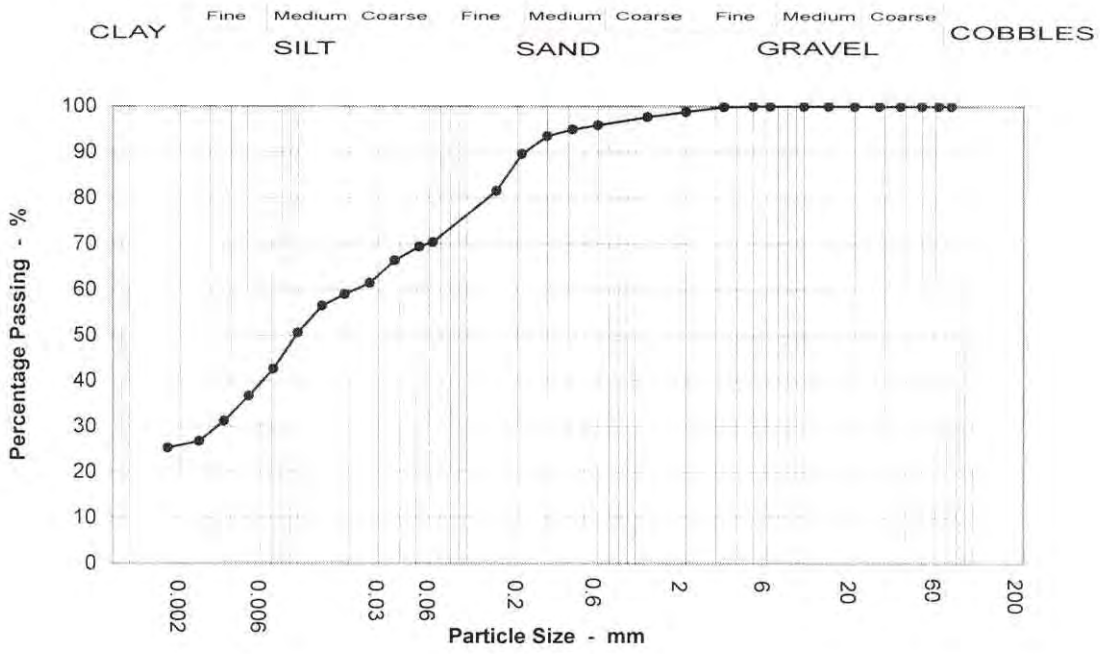
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	36.00 m
Visual Soil Description	**Dark grey slightly gravelly slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.052	69
63	100	0.037	66
50	100	0.027	61
37.5	100	0.019	59
28	100	0.014	57
20	100	0.010	51
14	100	0.007	43
10	100	0.005	37
6.3	100	0.004	31
5	100	0.003	27
3.35	100	0.002	25
2	99		
1.18	98		
0.6	96		
0.425	95		
0.3	93		
0.212	90		
0.15	82		
0.063	70		

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

Sample Proportions	
Cobbles	0.0
Gravel	1.2
Sand	28.7
Silt	44.4
Clay	25.8

Grading Analysis	
D100	5.0
D60	
D10	
Uniformity Coefficient	N/A

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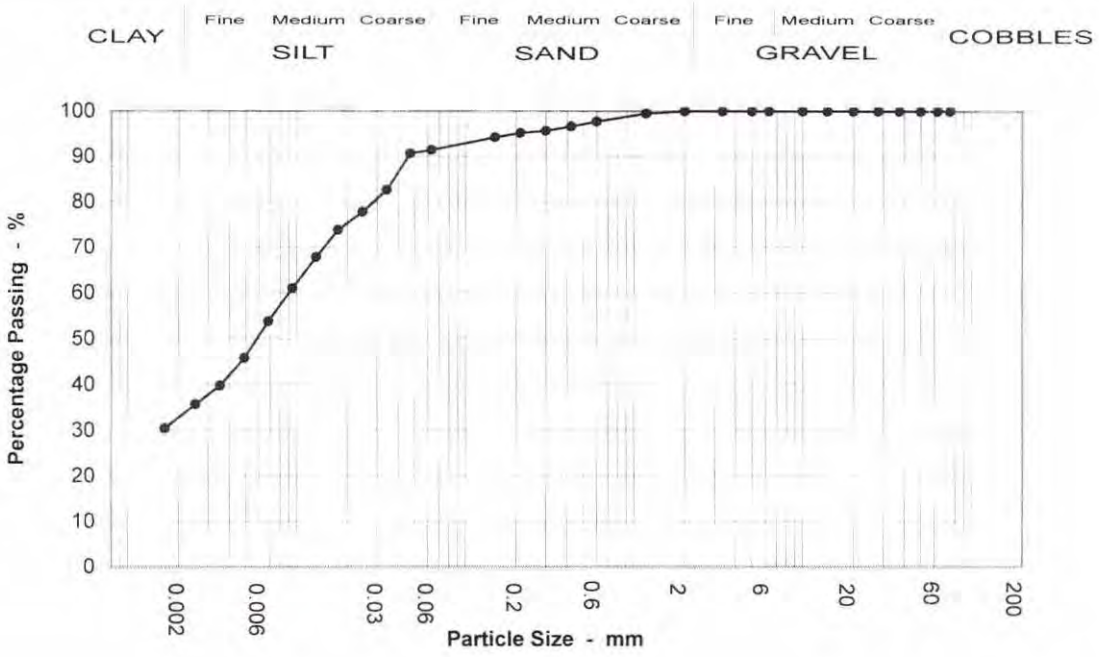
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC937
Location	**GCOB**	Sample No	
		Depth	49.00 m
Visual Soil Description	**Dark grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.047	91
63	100	0.034	83
50	100	0.025	78
37.5	100	0.018	74
28	100	0.013	68
20	100	0.009	61
14	100	0.007	54
10	100	0.005	46
6.3	100	0.004	40
5	100	0.003	36
3.35	100	0.002	31
2	100		
1.18	100		
0.6	98		
0.425	97		
0.3	96		
0.212	95		
0.15	94		
0.063	92		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	8.7
Silt	58.8
Clay	32.6

Grading Analysis	
D100	2.0
D60	
D10	
Uniformity Coefficient	N/A

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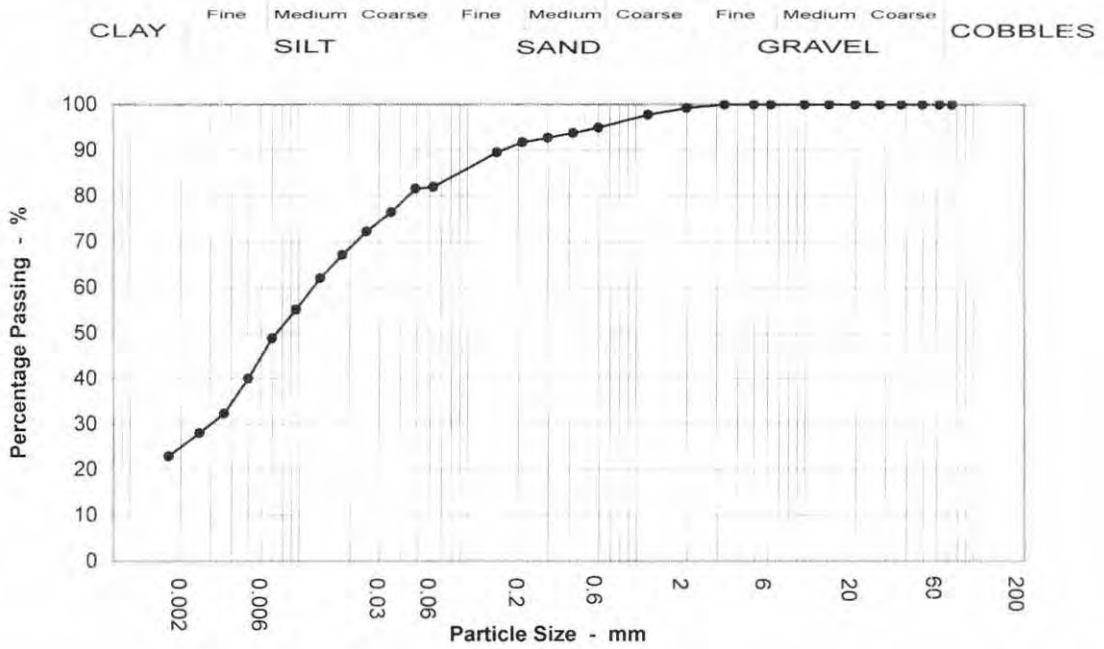
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC940
Location	**GCOB**	Sample No	
		Depth	10.00 m
Visual Soil Description	**Dark grey brown slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.049	82
63	100	0.035	76
50	100	0.025	72
37.5	100	0.018	67
28	100	0.013	62
20	100	0.010	55
14	100	0.007	49
10	100	0.005	40
6.3	100	0.004	32
5	100	0.003	28
3.35	100	0.002	23
2	99		
1.18	98		
0.6	95		
0.425	94		
0.3	93		
0.212	92		
0.15	90		
0.063	82		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.8
Sand	17.3
Silt	57.2
Clay	24.7

Grading Analysis	
D100	3.4
D60	
D10	
Uniformity Coefficient	N/A

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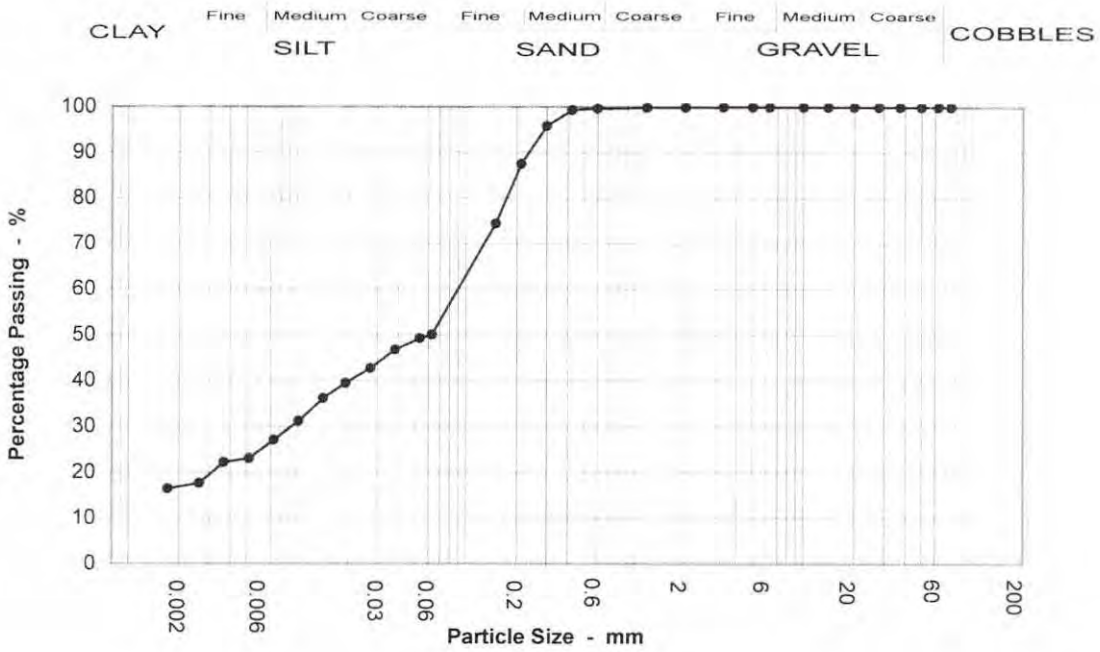
PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC940
Location	**GCOB**	Sample No	
		Depth	19.00 m
Visual Soil Description	**Dark grey clayey very silty SAND**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.054	49
63	100	0.038	47
50	100	0.027	43
37.5	100	0.019	39
28	100	0.014	36
20	100	0.010	31
14	100	0.007	27
10	100	0.005	23
6.3	100	0.004	22
5	100	0.003	18
3.35	100	0.002	16
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	96		
0.212	88		
0.15	74		
0.063	50		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.1
Sand	50.2
Silt	33.0
Clay	16.8

Grading Analysis	
D100	3.4
D60	0.1
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

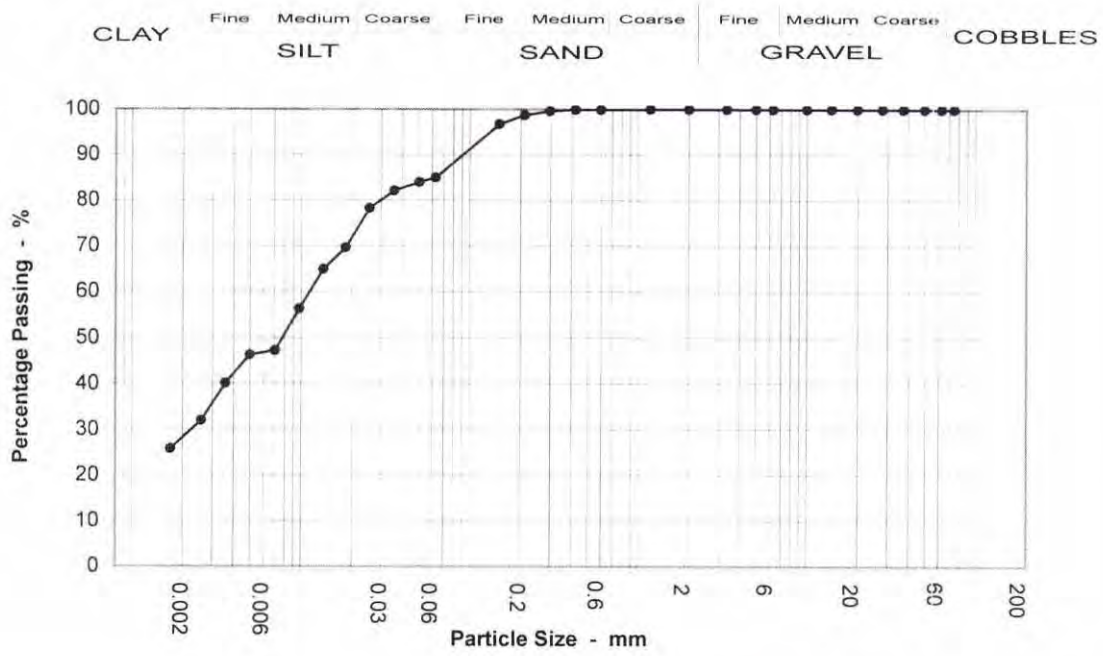
Checked and Approved
Initials: kp
Date: 2/5/2007

All samples connected with this report ,incl any on 'hold' will be disposed off according to Company Policy. Acopy of this policy is available on request

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**4949**
		Borehole / Pit No	RC940
Location	**GCOB**	Sample No	
		Depth	14.00 m
Visual Soil Description	**Dark grey slightly sandy clayey SILT**	Sample type	



Seiving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.050	84
63	100	0.036	82
50	100	0.025	78
37.5	100	0.018	70
28	100	0.014	65
20	100	0.010	56
14	100	0.007	47
10	100	0.005	46
6.3	100	0.004	40
5	100	0.003	32
3.35	100	0.002	26
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	97		
0.063	85		

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

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	15.3
Silt	56.8
Clay	27.9

Grading Analysis	
D100	1.2
D60	
D10	
Uniformity Coefficient	N/A

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J.Phaure(Lab.Mgr) Bhavika.R.(Qual.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 05/02/2007

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09/02/2007

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 847687	Contract: N6 Galway City Outer Bypass Client: Engineer: Date: Tested by: DD Checked: DJ

BS 1377 : Part 5 : 1990 Clause 3.4, 7.4

CBR Test Results

Location	Depth	moisture content	Bulk D Mg/m3	Dry D Mg/m3	CBR %	Comments
BH 1223 N	3	8.9	2.148	1.971	6.1	
TP 0730	1	24.5	1.950	1.570	0.3	
TP 0760	0.4	32.8	1.586	1.194	0.2	
TP 0760	1.6	15.7	2.186	1.889	2.3	
TP 0779	0.5	35.6	1.800	1.330	0.34	
TP 0810	0.5	16.1	1.916	1.650	1.4	
TP 1079	0.3	19.9	2.043	1.705	0.4	
TP 1086	0.6	12.3	2.182	1.942	8.3	
TP 1088	0.5	10.6	2.166	1.958	5.4	
TP 1132	1	11.0	2.270	2.040	0.21	
TP 1233	1.0-1.5	11.2	2.310	2.078	0.4	
TP 1236	0.5-0.8	10.8	2.241	2.023	0.8	
TP 1263	0.5	13.2	2.267	2.003	0.3	

09/02/2007

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 847687	Contract: N6 Galway City Outer Bypass Client: Engineer: Date: Tested by: DD Checked: DJ

BS 1377 : Part 5 : 1990 Clause 5.4

MCV Test Results.

Location	Depth	moisture content	MCV
TP 0693	0.35	68.1	3.7
TP 0695	0.3	43.4	<1
TP 0733	1.6	98.6	<1
TP 0733 C	0.4	62.7	<1
TP 0737	0.7	13.6	4.8
TP 0810	0.5	15.5	7.8
TP 1079	0.3	29.6	6.3
TP 1086	0.6	11.3	7.8
TP 1088	0.5	8.5	9.5
TP 1132	1.0	11.5	<1
TP 1233	1.0-1.5	11.0	3.6
TP 1236	0.5-0.8	10.6	7
TP 1263	0.5	11.6	<1

Compaction/CBR/Moisture content test *BS1377:1990; Part 4, Clause 3.4, 7.4*
Moisture Condition Value / Moisture Content BS1377:1990; Part 4, Clause 5.5

IRISH DRILLING LTD. **Loughrea, Co. Galway**	**Contract:** N6 GCOB **Client:** **Engineer:** **Date:** 11/12/2006 **Tested:** MPD **Chckd:** DCD	**Location:** TP 951 **Depth:** 1.0 m

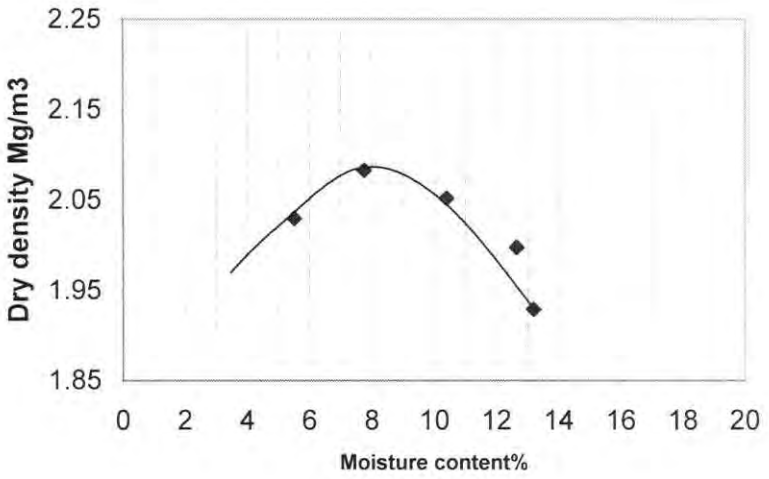
Description: Grey silty very sandy GRAVEL.

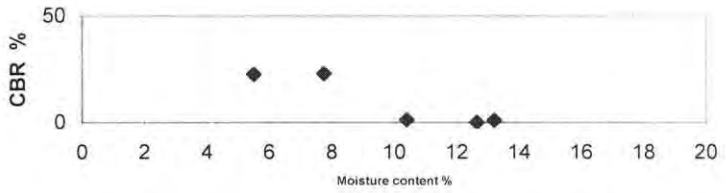
moisture content %	dry density Mg/m³
5.5	2.03
7.75	2.083
10.4	2.052
12.65	1.998
13.2	1.929

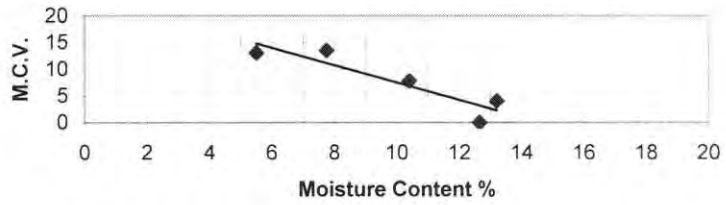
moisture content %	CBR %
5.5	22.7
7.75	23
10.4	1.3
12.65	0.1
13.2	1

Gs assumed: 2.70

Moisture content %	MCV %
5.5	13.1
7.75	13.5
10.4	7.8
12.65	<1
13.2	4







RESULTS:

Maximum dry density:	2.09 Mg/m³	
Optimum moisture content:	8.0 %	
Natural moisture content*:	9.9 %	* refers to bulk sample before removal of coarse particles
Passing 20mm sieve:	78 %	
Natural moisture content:**	13.2 %	** refers to test sample after removal of coarse particles

Compaction/CBR/Moisture content test *BS1377:1990; Part 4, Clause 3.4, 7.4*
Moisture Condition Value / Moisture Content BS1377:1990; Part 4, Clause 5.5

IRISH DRILLING LTD. **Loughrea, Co. Galway**	**Contract:** N6 GCOB **Client:** **Engineer:** **Date:** 02/01/2007 **Tested:** TS **Chckd:** DCD	**Location:** TP 971 **Depth:** 1.0 m

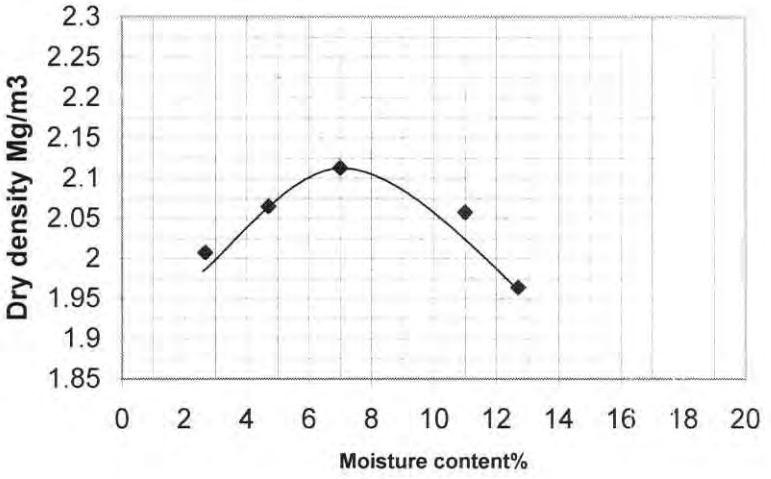
Description: Brown slightly sandy slightly gravelly SILT / CLAY with occasional cobbles.

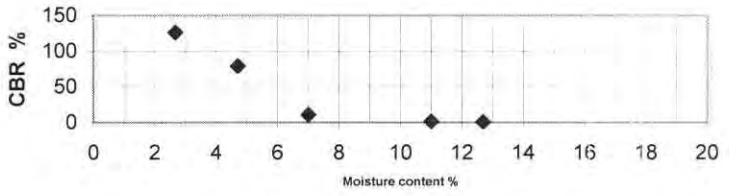
moisture content %	dry density Mg/m³
2.67	2.008
4.7	2.065
7	2.113
11	2.058
12.7	1.964

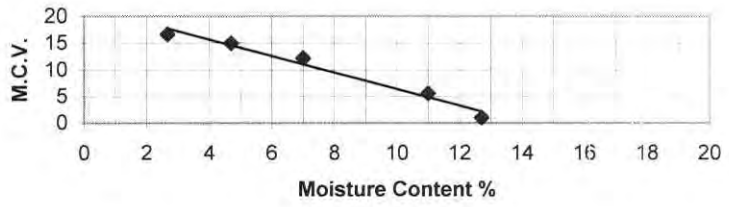
moisture content %	CBR %
2.67	126.3
4.7	79.5
7	11.2
11	2
12.7	0.7

Gs assumed: 2.70

Moisture content %	MCV %
2.67	16.7
4.7	15
7	12.2
11	5.6
12.7	1







RESULTS:

Maximum dry density:	2.11	Mg/m³
Optimum moisture content:	7.0	%
Natural moisture content*:	10.3	%
Passing 20mm sieve:	90	%
Natural moisture content:**	13.6	%

* refers to bulk sample before removal of coarse particles

** refers to test sample after removal of coarse particles

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
06-B07348-S0022	BH 0826	1.5-2.0M	6.1	8.48		0.004	15	-		
06-B07348-S0023	BH 0831	0.5-1.0M	7.5	8.51		<0.003	16	0.3		
06-B07348-S0024	BH 0832	1.50-2.00	7.0	8.46		0.003	-	-		
idl	BH 0841	1.0-1.5		7.6		0.03			2.8	
IDL	BH 0864	0.0-0.5							51.54	
06-B07348-S0025	BH 0864A	2.5-3.5M	44.7	8.09		0.104	-	31.0		
IDL	BH 0888	1.5-2.0							26.7	
06-B07348-S0026	BH 0888	3.5-4.5M	22.2	7.99		0.244	-	-		
	BH 0888	5.3 W		8.34		0.01				
IDL	BH 0896	0.0-1.0							81.6	
IDL	BH 0911 A	0.5-1.0							68.4	
IDL	BH 0911 B	0.5-1.0							62.82	
	BH 0911 B	1.5 W		8.11		0.02				
IDL	BH 0911 B	1.5-2.0				0.12				
06-B07348-S0027	BH 0915	0.5-1.0M	102.0	6.98		NDP	-	2.2		
IDL	BH 0934	0.5-1.0							55.7	
IDL	BH 0934	3.5-4.0		7.52		0.59			3.69	
idl	BH 0934A	3.5-4.0							6.8	
IDL	BH 0934 A	6.5-7.0							22.6	

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
IDL	BH 0939	1.5-1.95							36.9	
IDL	BH 0939	2.5-3.0		7.56		0.16				
IDL	BH 0943 A	4.0-5.0				0.72			37.4	
IDL	BH 0943 A	6.5-7.0				0.08				
06-B07084-S0011	BH 1003	0.8M	17.8	8.48	<5		-	1.45	-	
06-B06861-S0006	BH 1149	1.00-1.50	44.9	7.33	<5					
06-B06861-S0007	BH 1174	1.00-1.50	49.6	7.98	11					
06-B06861-S0005	BH 1175a	1.00-1.50	24.4	8.15	12					
	BH 1182	0.0-1.0							76.5	
06-B06861-S0008	BH 1182	1.00-1.50	463.6	8.35	<5					
	BH 1189	0.0-1.0							15.72	
06-B06861-S0009	BH 1189	1.00-1.50	26.3	7.56	<5					
06-B06861-S0004	BH 1235	1.00-1.50	10.2	8.47	10					
06-B07084-S0019	BH 1237	0.5-0.8M	5.0	8.61	<5		-	-	-	
06-B07084-S0007	BH 1278	1M	31.6	8.53	<5		33	-	-	
	TP 0502	0.10							16.13	
IDL	TP 0503	0.15							25.6	
06-B07348-S0010	TP 0509	2.0M	1.9	6.83		0.069	-	-		
06-B07084-S0015	TP 0512	1M	21.7	7.51	<5		33	0.78	-	
06-B07348-S0011	TP 0516	0-0.5M	55.6	4.55		0.022	-	-		

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
	TP 0525	1.50							10.2	
06-B07084-S0018	TP 0559	0.7M	121.5	8.69	<5		-	45.97	-	
	TP 0560	2.30							37.6	
06-B07084-S0017	TP 0560	1M	82.1	8.63	<5		84	39.00	-	
	TP 0577	0.80							73	
	TP 0588	1.50							93.6	
	TP 0600	1.00							81.2	
	TP 0611	0.80							84.66	
	TP 0629	1.00							78.6	
06-B07348-S0012	TP 0639	1-2M	41.3	5.07		NDP	206	43.0		
06-B07348-S0013	TP 0657	0.9M	42.8	4.91		0.463	207	39.0		
	TP 0658	0.60							29.8	
	TP 0669	2.20							18.2	
06-B07084-S0002	TP 0684	0.9M	70.9	8.23	<5		-	-	-	
06-B07084-S0006	TP 0686	0.9M	404.7	8.03	<5		-	-	-	
IDL	TP 0693	0.35							44.4	
06-B07348-S0014	TP 0698	1.6M	5.8	7.43		0.005	-	-		
06-B07348-S0015	TP 0699	0.7M	9.2	7.17		0.007	-	0.6		
06-B07348-S0016	TP 0701	1.4M	6.7	8.42		0.049	-	-		
06-B07348-S0017	TP 0709	0.5M	7.2	6.88		0.008	-	-		

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
06-B07348-S0018	TP 0710	1.0M	12.0	6.73		0.004	-	0.4		
idl	TP 0716	0.70		6.23		0.12	0		9.64	
	TP 0716	1.6							7.77	
idl	TP 0718	1.50		5.22		0.56			21.9	
idl	TP 0718	2.50		7.3		0.06				
	TP 0719	1.6 W		7.45		0.07				
IDL	TP 0721	0.50							62.96	
IDL	TP 0732 B	0.20							17.45	
	TP 0732 C	1.25 W		7.65		0.03				
IDL	TP 0733 B	0.50							81.9	
IDL	TP 0733 C	0.40		6.34		<0.01	0			
NMTL 249	TP 0754	0.50		6.3		<0.01				
IDL	TP 0754 A	0.50							73.7	
NMTL 249	TP 0754 A	1.50						52.3		
NMTL 249	TP 0754 C	0.50		4.9		0.02				
	TP 0754 D	2.0 W		8.09		0.03				
NMTL 249	TP 0773	0.50		4.8		0.02				
IDL	TP 0789	0.60		6.44		0.01				
IDL	TP 0795	1.10		5.58					55.6	
IDL	TP 0796	0.50							76.5	

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
	TP 0902	0.8-1.0							82.2	
06-B07084-S0016	TP 0905	1-1.5M	8.5	8.35	<5		-	0.65	-	
	TP 0906	1.0-1.2							86.96	
06-B06861-S0014	TP 0906	2.10-2.30	119.8	8.13	<5					
IDL	TP 0907	1.8-2.0							67.6	
	TP 0908	0.5							0.736	
	TP 0909	0.5							36.11	
IDL	TP 0909	1		7.85		0.14				
	TP 0913	0.5							75.6	
	TP 0922	2.7							14.9	
idl	TP 0932	2.50		7.71		0.33			9.8	
idl	TP 0935	1.50		6.44		0.52			42.14	
idl	TP 0941	W 1.5		7.45		0.01				
IDL	TP 0941 A	2.00							64.4	
IDL	TP 0969	0.70		8.04		0.41				
NMTL 249	TP 0996	1.50		8.2		<0.01				
06-B07084-S0012	TP 1023	1-1.5M	143.9	8.47	<5		-	-	73.2	
06-B06861-S0017	TP 1052	0.60-1.00	22.0	8.29	11					
IDL	TP 1055	0.60		8.3		0.048				
06-B07084-S0004	TP 1079	.3M	25.0	7.70	<5		-	-	-	

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
06-B07084-S0010	TP 1085	0.5M	10.5	8.73	<5		-	-	-	
06-B07084-S0009	TP 1088	.5M	7.8	8.68	<5		-	-	-	
IDL	TP 1091	0.40							18.5	
06-B07084-S0003	TP 1093	1.5M	11.5	8.65	<5		-	-	-	
	TP 1100	1.00							72.9	
06-B07084-S0001	TP 1111	1M	12.9	8.43	<5		-	0.64	-	
06-B07084-S0008	TP 1111	2M	17.7	8.54	<5		-	-	-	
NMTL 249	TP 1132	1.00		8.7		0.08				
06-B06861-S0015	TP 1150	0.40	10.2	8.51	16					
06-B06861-S0013	TP 1162	1.00	13.4	8.37	15					
NMTL 249	TP 1219	0.6-1.0		8.4		0.18				
IDL	TP 1230	1.60		8.15		0.02				
idl	TP 1236	0.5-0.8		7.96		0.01				
idl	TP 1243	0.50		8.24		0.00				
idl	TP 1257	1.70		8.46		0.34				
idl	TP 1263	0.50		8.35		0.00				
06-B06861-S0016	TP 1275	0.50	14.1	8.25	18					
06-B06861-S0012	TP 1288	0.60	12.1	8.08	22					
06-B06861-S0010	TP 1298	0.80	8.5	8.50	24					
06-B06861-S0019	TP 1301	0.50	7.0	8.51	22					

N6 Galway City Outer Bypass Chemical Test Results

ALcontrol Reference	Sample Identity	Other ID	Natural Moisture Content	pH	Acid Soluble Sulphide	Soluble Sulphate 2:1 Extract	Chloride	Total Organic Carbon**	Loss on Ignition**	
			%	pH Units	mg/kg	g/l	mg/kg	%	%	
06-B06861-S0018	TP 1303	1.00	10.0	8.40	24					
IDL	TP 1412	0.50		7.5		0.02				
idl	TP 1412	0.7				0.00				
06-B06861-S0011	TP 1429	1.00-1.20	676.1	8.26	<5				81.83	
IDL	TP 1435	1.0							53.7	
idl	TP 1447	1.00							78.5	

Project Name: GCOB	Project No:	**K4**
Client: Irish Drilling	Reference: 4949	**SOILS LABORATORY**

Borehole No:	Sample No:	Depth m	Description	pH	Sulphate Content *
RC936	C	40.0-41.0			0.01
RC936	C	6.0-7.0			0.01
RC936	C	24.0-25.0			0.01
RC936	C	51.0-52.0			2.93
RC937	C	11.0-12.0			0.01
RC937	C	19.0-20.0			0.01
RC937	C	32.0-33.0			0.01
RC940	C	14.0-15.0			2.00

* expressed as %.

09/02/2007	**Total Sulphate Content** BS 1377 : Part 3 : Clause 5 : 1990 Determination of sulphate content by acid extract	Approved Initials : kp

Project Name:	GCOB	Project No:	GCOB	K4 SOILS LABORATORY
Client:	Irish Drilling	Reference:	4949	

Borehole No:	Sample No:	Depth m	Description	Organic Content (%)
RC936	C	6.0-7.0	Grey clayey sandy very silty GRAVEL	0.40
RC936	C	24.0-25.0	Grey slightly silty slightly clayey gravelly SAND	1.15
RC936	C	40.0-41.0	Grey slightly sandy clayey SILT	17.51
RC936	C	51.0-52.0	Dark grey slightly gravelly very sandy clayey SILT	17.68
RC937	C	11.0-12.0	Dark grey very sandy silty CLAY	4.90
RC937	C	19.0-20.0	Dark grey slightly gravelly very sandy clayey SILT	25.69
RC937	C	32.0-33.0	Dark grey slightly sandy clayey SILT	17.21
RC937	C	36.0-37.0	Dark grey slightly gravelly slightly sandy clayey SILT	12.35
RC940	C	10.0-11.0	Dark grey brown slightly sandy clayey SILT	17.47
RC940	C	19.0-20.0	Dark grey clayey very silty SAND	8.97

* expressed as %

2/6/2007	**Organic Content of Soil** BS 1377 : Part 3 : Clause 4 : 1990 Determination of the mass loss on ignition	Approved Initials :KP

Project Name:	GCOB			K4 SOILS LABORATORY
Client:	Irish Drilling	Project No:	GCOB	
		Reference:	4949	

Borehole No.	Sample No.	Depth m	Description	pH	Sulphate content (g/l)
RC936		6.00	Grey clayey sandy very silty GRAVEL	7.6	
RC936		24.00	Grey slightly silty slightly clayey gravelly SAND	7.4	
RC936		40.00	Grey slightly sandy clayey SILT	6.7	
RC936		51.00	Dark grey slightly gravelly very sandy clayey SILT	6.4	
RC937		11.00	Dark grey very sandy silty CLAY	7.1	
RC937		19.00	Dark grey slightly gravelly very sandy clayey SILT	6.7	
RC937		32.00	Dark grey slightly sandy clayey SILT	6.7	
RC940		14.00	Dark grey slightly sandy clayey SILT	6.8	

Date 2/5/2007

Summary of Test Results

BS 1377 : Part 3 :Clause 5 : 1990

Determination of sulphate content of soil and ground water : gravimetric method

Checked and Approved

Initials : kp

Client name & address:				Date received:	12/1/2006	K4 SOILS	
Irish Drilling				Date sampled:	1/4/2007		
Project Name:	GCOB			Date tested:	1/22/2007		
Project No:	-	Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:				Sample no/ type:	C	BH no:	RC936
Grey slightly sandy clayey SILT						Depth (m):	40

Test details

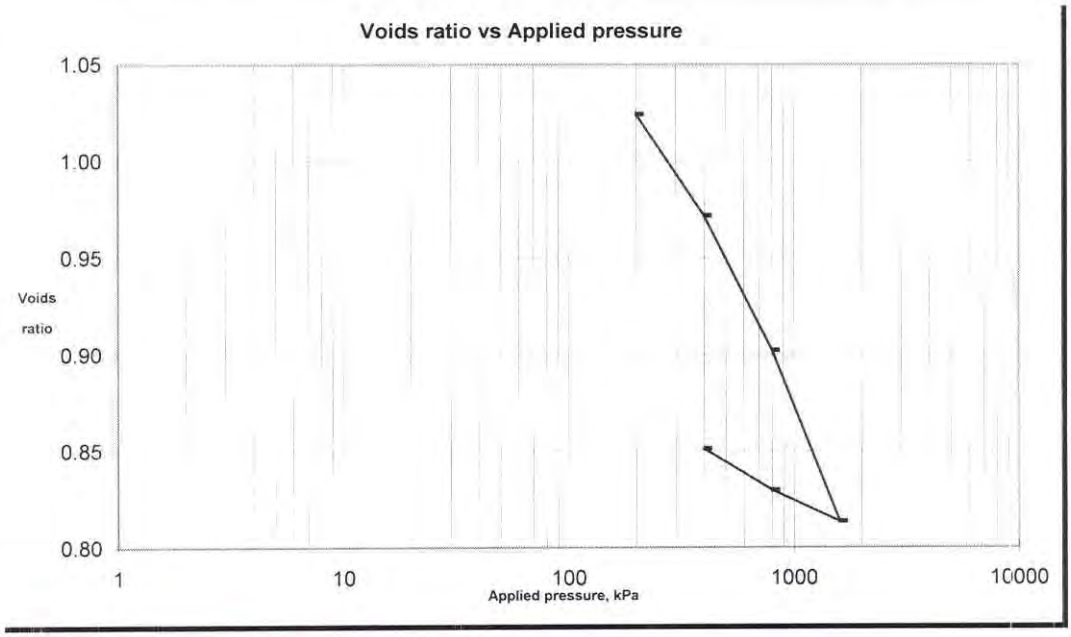
Depth within original sample m : 40.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.0	16.3
Diameter	mm :	75.0	-
Bulk density	Mg/m^3 :	1.68	1.98
Moisture content	% :	33	34
Dry density	Mg/m^3 :	1.27	1.48
Voids Ratio	:	1.16	0.85
Degree of saturation	% :	77.0	-
Particle density	Mg/m^3 :	2.74	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN	Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN
1	200	1.0241	4.47	0.317	11				
2	400	0.9718	0.65	0.129	12				
3	800	0.9022	0.15	0.088	13				
4	1600	0.8135	0.14	0.058	14				
5	800	0.8296	1.01	0.011	15				
6	400	0.8510	0.19	0.029	16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R (Qual.Mgr)

All samples connected with this report incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

Client name & address:				Date received:	12/1/2006	K4 SOILS	
Irish Drilling				Date sampled:	1/4/2007		
Project Name:	GCOB			Date tested:	1/22/2007		
Project No:	-	Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:				Sample no/ type:	C	BH no:	RC936
Dark grey slightly gravelly very sandy clayey SILT						Depth (m):	51

Test details

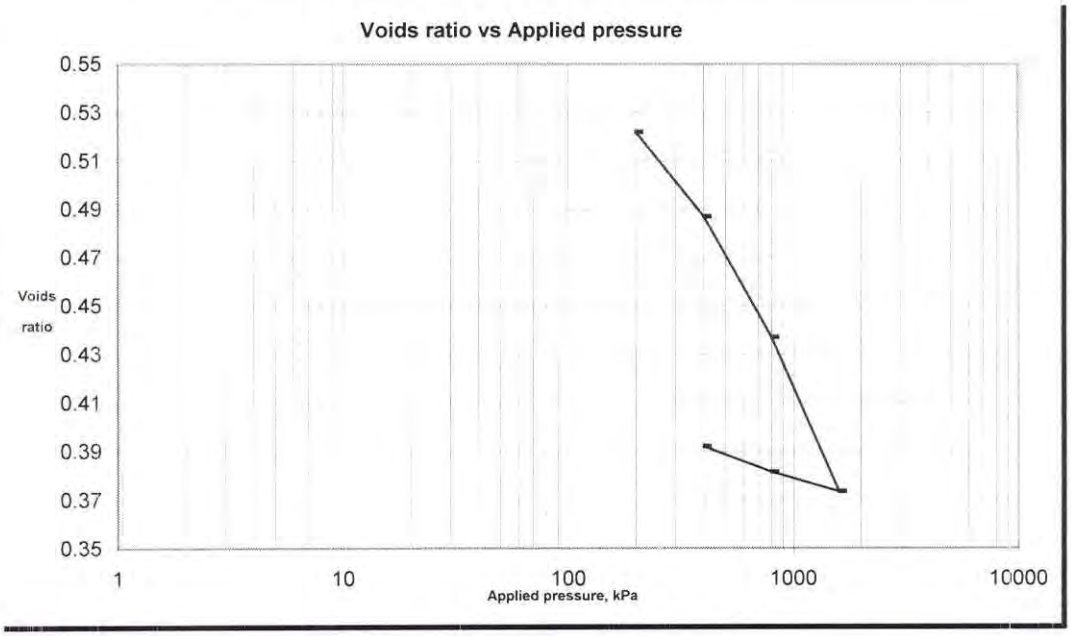
Depth within original sample m : 51.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.0	16.3
Diameter	mm :	75.0	-
Bulk density	Mg/m^3 :	2.17	2.42
Moisture content	% :	28	23
Dry density	Mg/m^3 :	1.69	1.97
Voids Ratio	:	0.62	0.39
Degree of saturation	% :	124.9	-
Particle density	Mg/m^3 :	2.74	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN	Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN
1	200	0.5219	4.51	0.301	11				
2	400	0.4870	1.78	0.115	12				
3	800	0.4370	3.11	0.084	13				
4	1600	0.3736	1.29	0.055	14				
5	800	0.3816	13.98	0.007	15				
6	400	0.3922	1.84	0.019	16				
7					17				
8					18				
9					19				
10					20				



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Client name & address:				Date received:	12/1/2006	K4 SOILS	
Irish Drilling				Date sampled:	1/4/2007		
Project Name:	GCOB			Date tested:	1/22/2007		
Project No:	-	Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:				Sample no/ type:	C	BH no:	RC937
Dark grey slightly gravelly very sandy clayey SILT						Depth (m):	19

Test details

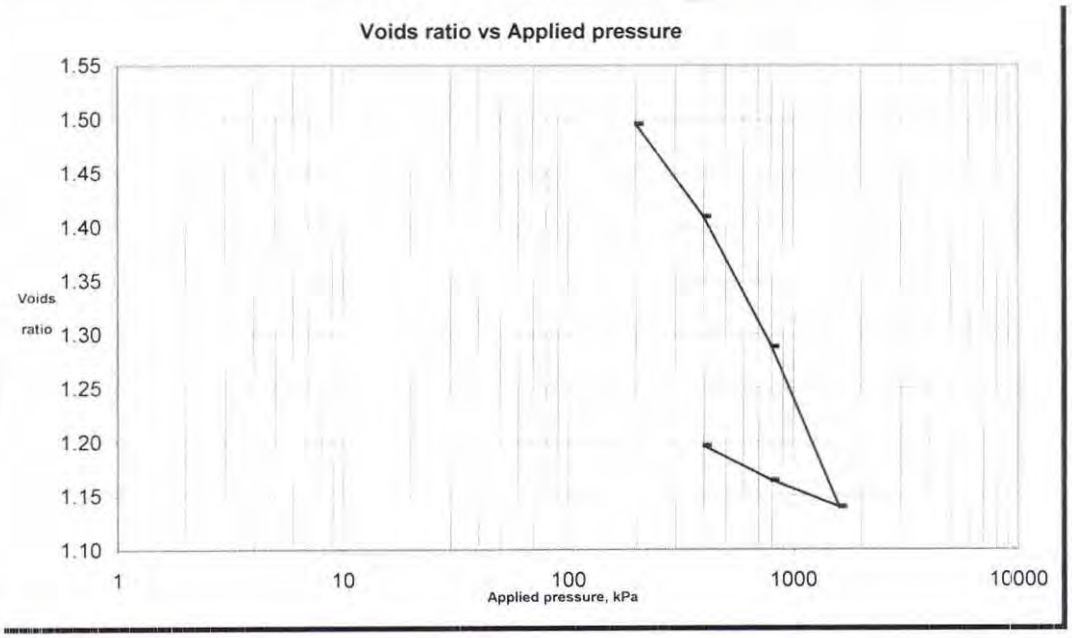
Depth within original sample m : 19.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.0	15.3
Diameter	mm :	75.0	-
Bulk density	Mg/m^3 :	1.45	1.84
Moisture content	% :	44	48
Dry density	Mg/m^3 :	1.01	1.25
Voids Ratio	:	1.72	1.20
Degree of saturation	% :	70.6	-
Particle density	Mg/m^3 :	2.74	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN	Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN
1	200	1.4958	9.58	0.416	11				
2	400	1.4098	1.39	0.172	12				
3	800	1.2886	5.90	0.126	13				
4	1600	1.1396	1.66	0.081	14				
5	800	1.1642	12.08	0.014	15				
6	400	1.1963	0.92	0.037	16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 2/6/2007

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Client name & address:				Date received:	12/1/2006	K4 SOILS	
Irish Drilling				Date sampled:	1/4/2007		
Project Name:	GCOB			Date tested:	1/22/2007		
Project No:	-	Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:				Sample no/ type:	C	BH no:	RC937
Dark grey slightly sandy clayey SILT						Depth (m):	32

Test details

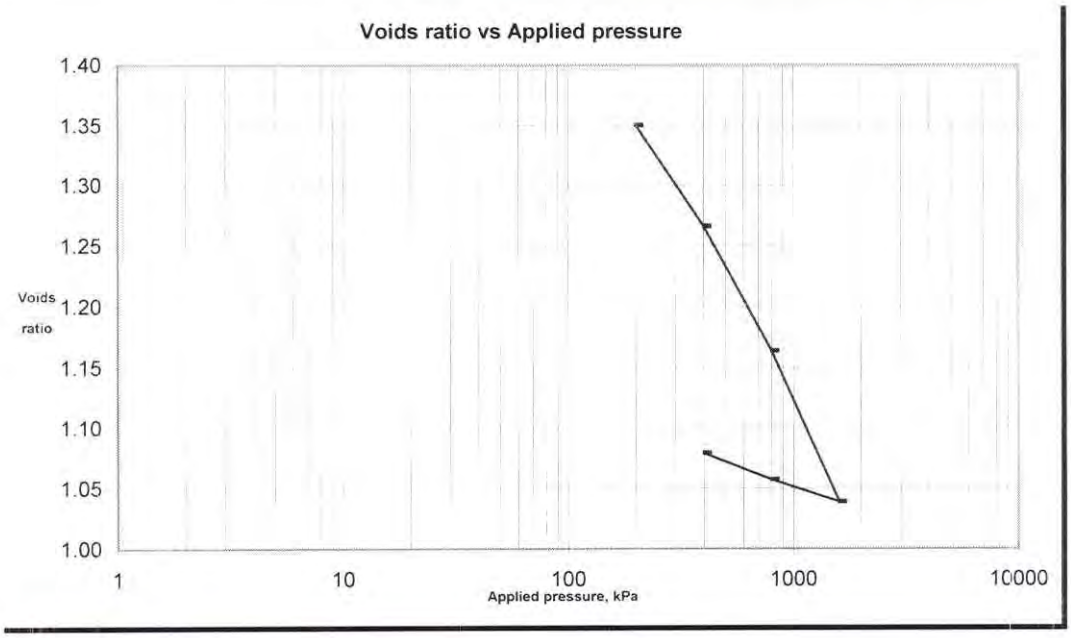
Depth within original sample m : 32.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.0	15.8
Diameter	mm :	75.0	-
Bulk density	Mg/m^3 :	1.45	1.83
Moisture content	% :	32	39
Dry density	Mg/m^3 :	1.10	1.32
Voids Ratio	:	1.50	1.08
Degree of saturation	% :	59.2	-
Particle density	Mg/m^3 :	2.74	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN	Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN
1	200	1.3502	18.20	0.296	11				
2	400	1.2661	3.26	0.179	12				
3	800	1.1635	0.19	0.113	13				
4	1600	1.0389	1.21	0.072	14				
5	800	1.0573	2.57	0.011	15				
6	400	1.0794	1.17	0.027	16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 2/6/2007

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Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/22/2007		
Project No:	- **Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC940
Dark grey slightly sandy clayey SILT				**Depth (m):**	14

Test details

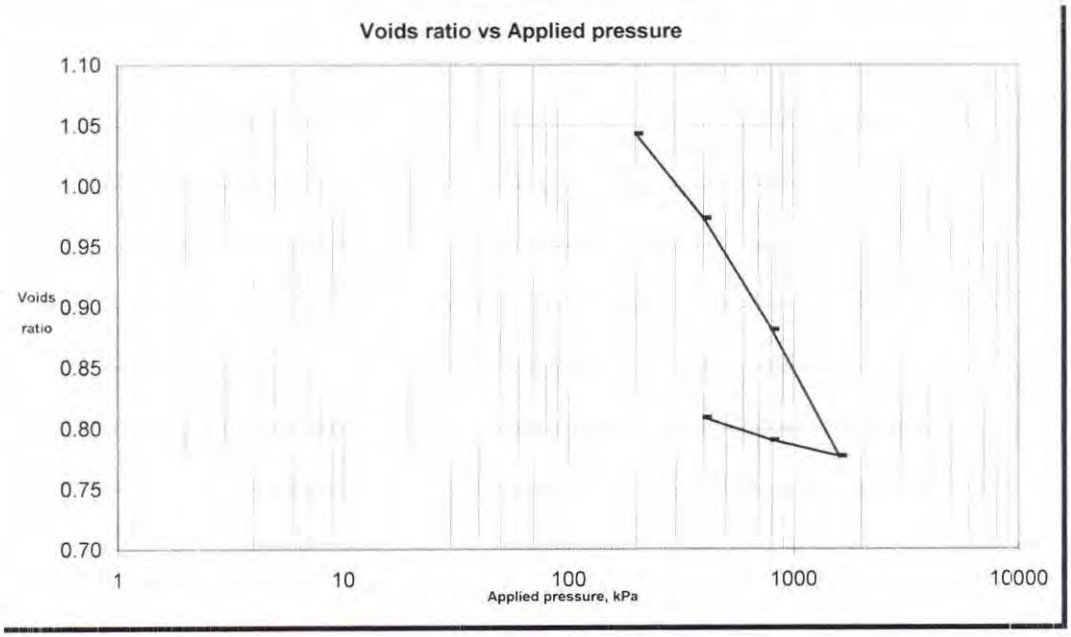
Depth within original sample m : 14.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	20.0	16.4
Diameter	mm :	75.0	-
Bulk density	Mg/m^3 :	1.61	1.99
Moisture content	% :	30	32
Dry density	Mg/m^3 :	1.24	1.51
Voids Ratio	:	1.21	0.81
Degree of saturation	% :	68.0	-
Particle density	Mg/m^3 :	2.74	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN	Stage Number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m^2/year	Coefficient of Compressibility m^2/MN
1	200	1.0434	14.42	0.369	11				
2	400	0.9734	0.40	0.171	12				
3	800	0.8816	0.16	0.116	13				
4	1600	0.7773	0.26	0.069	14				
5	800	0.7903	3.48	0.009	15				
6	400	0.8088	45.03	0.026	16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 2/6/2007

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National Materials Testing Laboratory Ltd.

SUMMARY OF TEST RESULTS

					Index Properties			Cell	Undrained Triaxial Tests			
Borehole	Depth	Moisture	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Cu	Mode of
No	m	%	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	Failure
BH888	3.5-4.5	194.1					1.24					HV=3.0 kPa
BH939	1.5-1.95	205.7					1.19					HV=4kPa
BH943a	4.0-5.0	429.2					1.22					HV=3.5kPa

NMTL	Notes :	Job ref No.	NMTL 259
	1. All BS tests carried out using preferred (definitive) method unless otherwise stated.	Location	GCOB-Galway

Table 1

SHEAR BOX TEST

Test Method: BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure: Remoulded with 2.5 kg rammer at natural moisture content.
60mm2 shear box tested.

Description: Light grey ocassionally dark grey sandy slightly gravelly SILT/CLAY.

Weighings	**Stage 1**	**Stage 2**	**Stage 3**
Wet soil	186.0	186.3	186.0
Dry soil	152.8	153.0	152.8
Wet soil	186.0	186.3	186.0
Dry soil	152.8	153.0	152.8
Water	33.2	33.2	33.2
MC : Measured %	21.7	21.72	21.74
Density Mg/m3	2.03	2.04	2.03
Dry DensityMg/m3	1.67	1.67	1.67
Voids ratio e	0.5854	0.5836	0.5864
Degree of saturation %	98	99	98

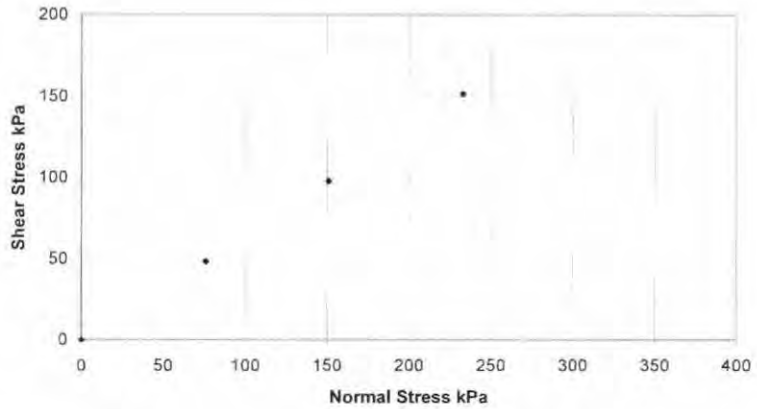
Nominal Dimensions		
Length	L1 mm	60
	L2 mm	60
Area	A mm2	3600
Height	H mm	25.4
Volume	V cm3	91.44
Sg	Mg/m3	2.65

Final Details

	Stage 1	Stage 2	Stage 3
Normal Loads kPa	76	151	233
Shear stress kPa	48.6	97.9	151.7
Displacement mm	9.25	5.95	5.67
Rate of displacement mm/ min	0.01		

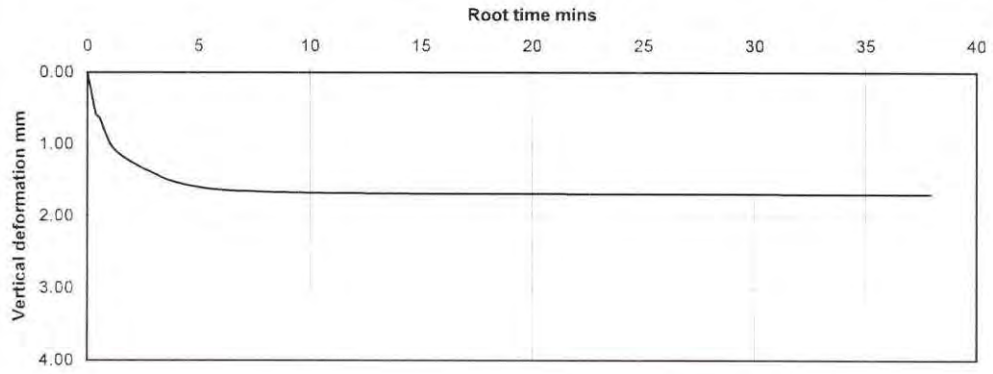
	Peak
Cohesion c' (kPa)	1.5
Friction angle phi'	32.3

Mohr Envelope

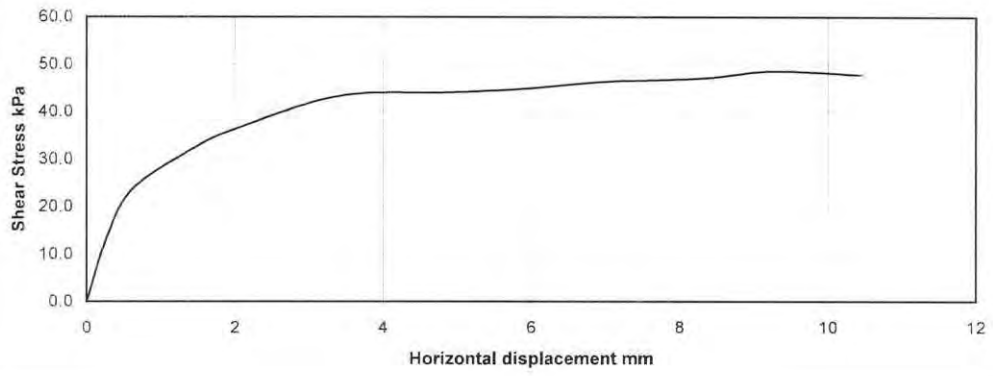


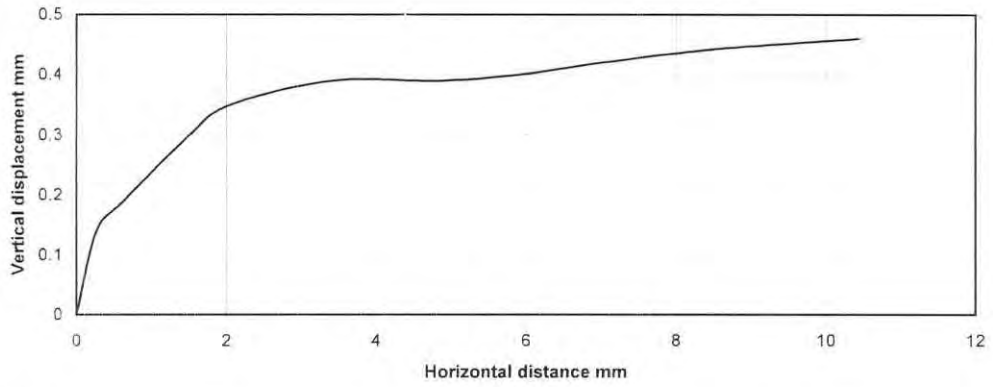
NM T L **Ltd**	Consolidated : Consolidated drained Shear Box Test in 60 mm square Box			Job No.	NMTL 259
				Borehole No	BH 943a
	Project	GCOB Galway		Sample No.	B
Operator Jo	Checked	Bc	Approved	Depth.	11.50m

CONSOLIDATION STAGE 1



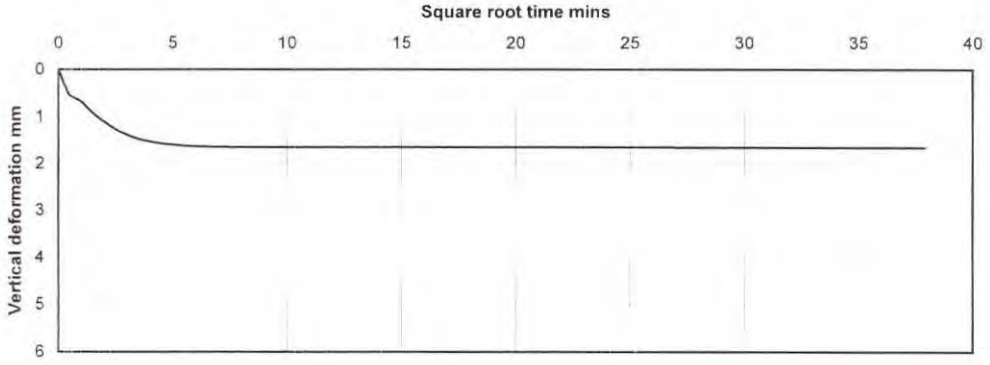
Shear Stage 1



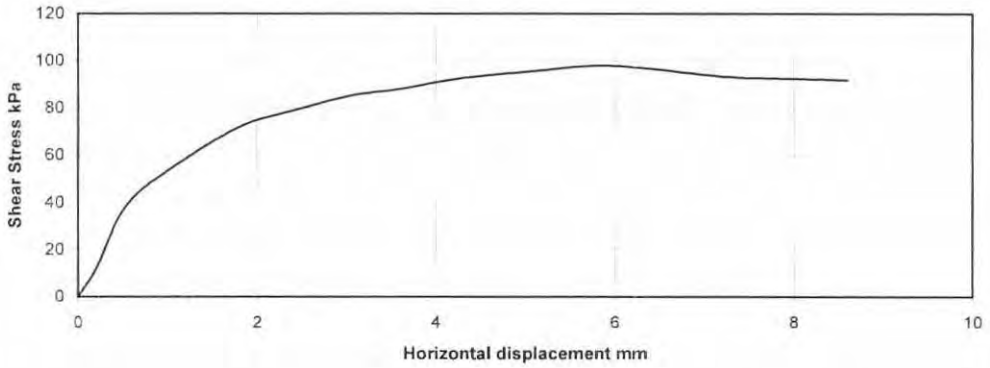


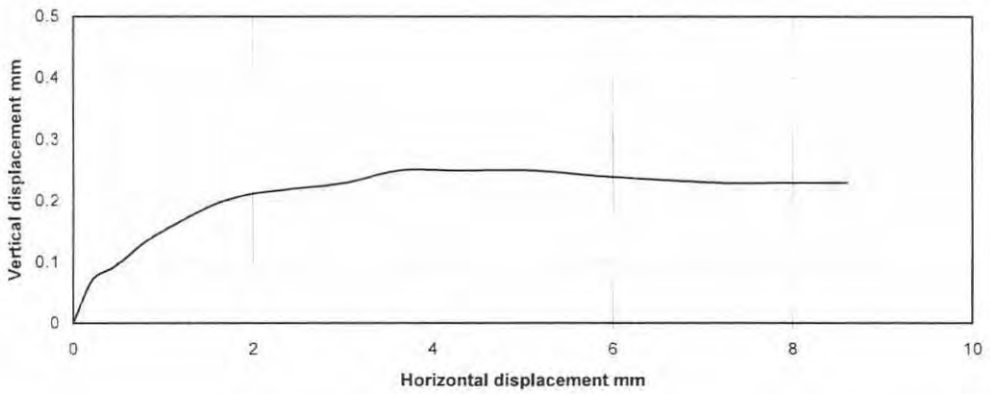
NM T L Ltd	Consolidated Consolidated drained Shear Box Test in 60 mm square Box			Job No.	NMTL 259
				Borehole No	BH 943a
	Project	GCOB Galway		Sample No.	B
Operator Jo	Checked	Bc	Approved	Depth.	11.50m

CONSOLIDATION STAGE 2

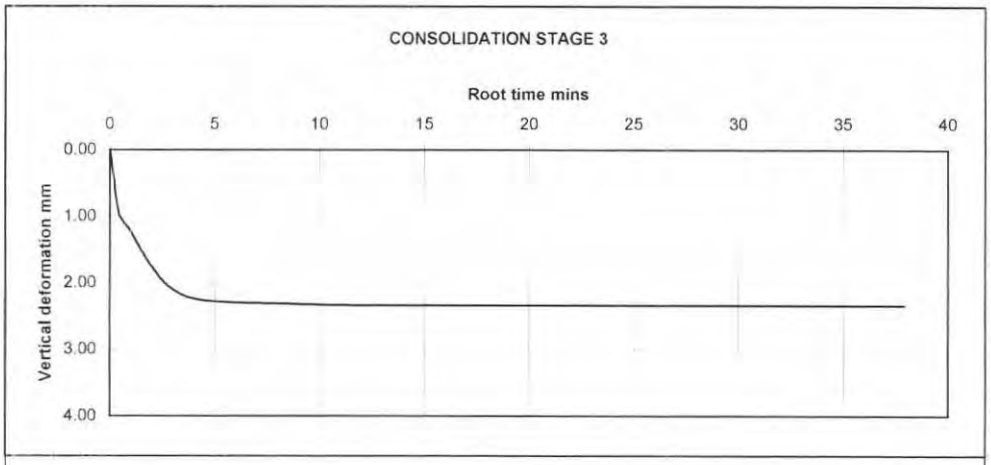


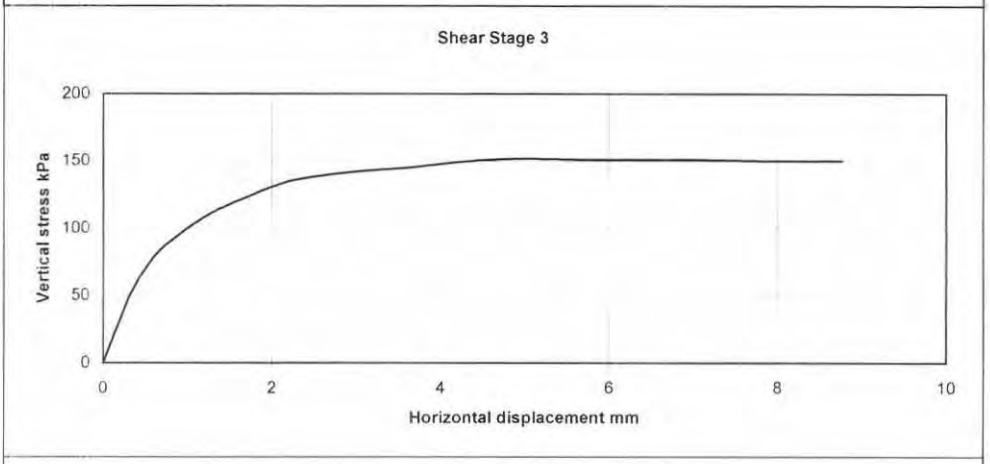
Shear Stage 2

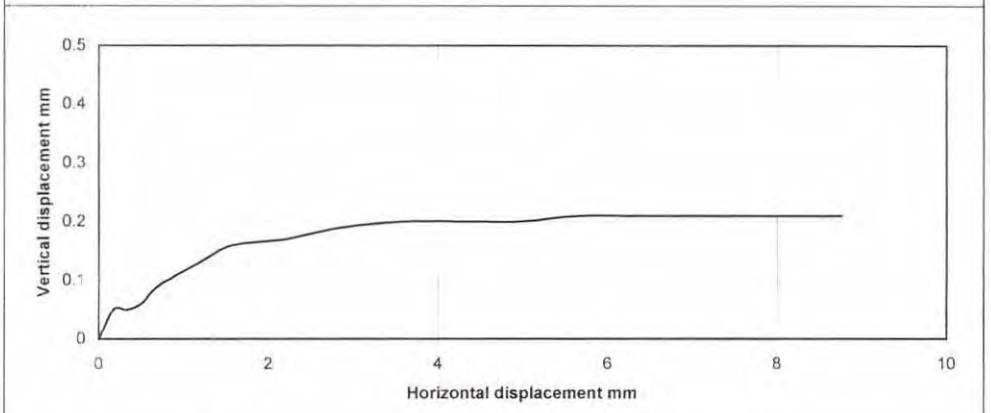




NM T L Ltd	Consolidated Consolidated drained Shear Box Test in 60 mm square Box			Job No.	NMTL 259
				Borehole No	BH 943a
	Project	GCOB Galway		Sample No.	B
Operator Jo	Checked	Bc	Approved	Depth.	11.50m







NM T L Ltd	Consolidated Consolidated drained Shear Box Test in 60 mm square Box			Job No.	NMTL 259
				Borehole No	BH 943a
	Project	GCOB Galway		Sample No.	B
Operator Jo	Checked	Bc	Approved	Depth.	11.50m

Client name & address:				Date received:	12/1/2006	K4 SOILS	
Irish Drilling				Date sampled:	1/4/2007		
Project Name:	GCOB			Date tested:	1/21/2007		
Project No: -		Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:				Sample no/ type:	C	BH no:	RC936
Grey slightly silty slightly clayey gravelly SAND				Sample size:	60mmx60mm	Depth(m):	24.0-25.0

Test details

Depth within original sample : N/A
Orientation within original sample : N/A
Specimen preparation : <2mm material remoulded
Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number		:	1	2	3
Height	mm	:	20	20	20
Length	mm	:	60	60	60
Width	mm	:	60	60	60
Bulk density	Mg/m^3	:	1.81	1.85	1.80
Moisture content	%	:	7.0	7.0	7.0
Dry density	Mg/m^3	:	1.69	1.73	1.68
Particle density	Mg/m^3	:	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa	:	200	400	600
Height at end of stage	mm	:	20	20	20

Shearing Stage

Applied normal stress	kPa	:	200	400	600
Rate of horizontal displacement	mm/min	:	1.52	1.52	1.52
Height at end of stage	mm	:	17.2	16.4	16.3
CONDITIONS AT FAILURE	*Criterion*	:	Maximum shear stress		
Shear stress	kPa	:	156	304	461
Horizontal relative displacement	mm	:	7.25	6.25	6.5

Final specimen details

Bulk density	Mg/m^3	:	-	-	-
Moisture content	%	:	16	16	15
Dry density	Mg/m^3	:	-	-	-

Shear strength parameters

Cohesion intercept,c'	kPa	:	0
Angle of shearing resistance,ϕ'	degrees	:	38.5

Notes : Specimens tested saturated.

*Set of three specimens	**Rapid Shearbox Test**	Approved by
	BS 1377 : Part 7 : Clause 4.5.4 : 1990	Initials : kp
	Determination of shear strength by direct shear (small shearbox apparatus)	Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R.(Qual.Mgr)
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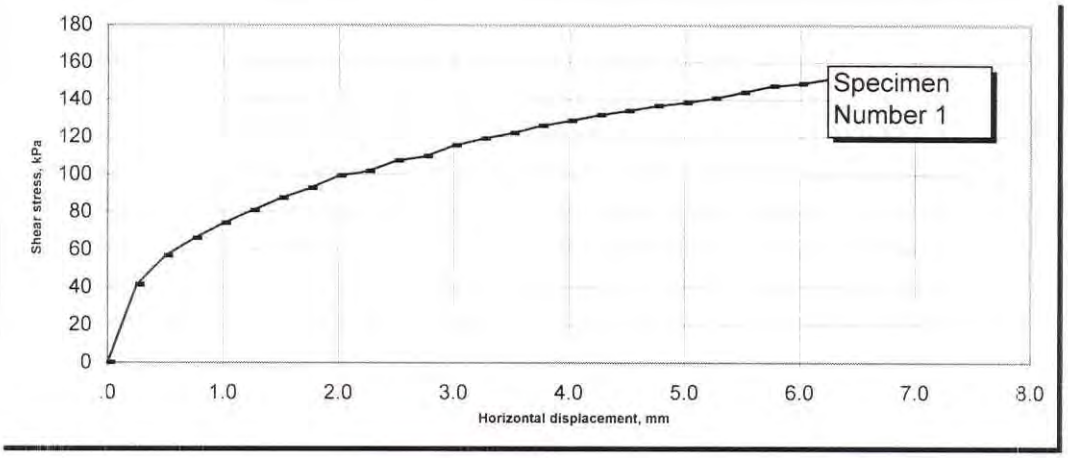
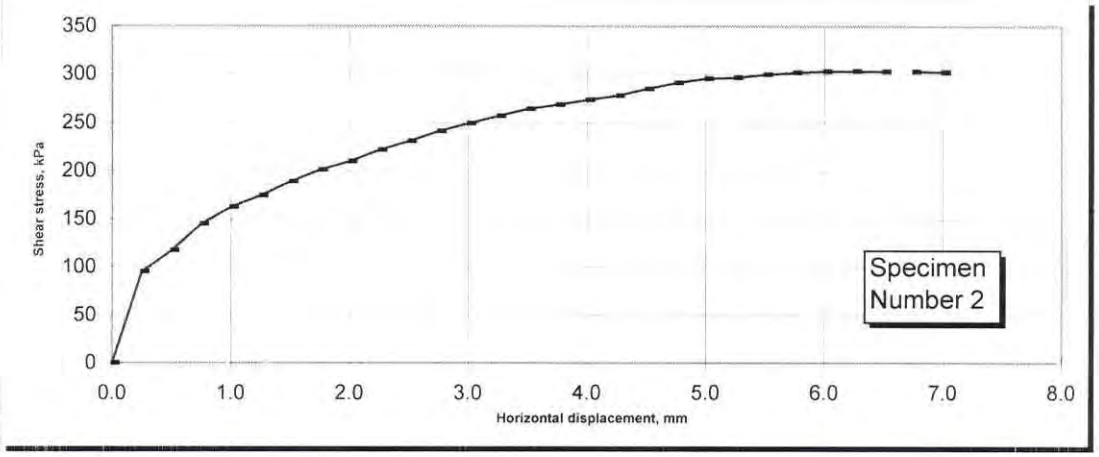
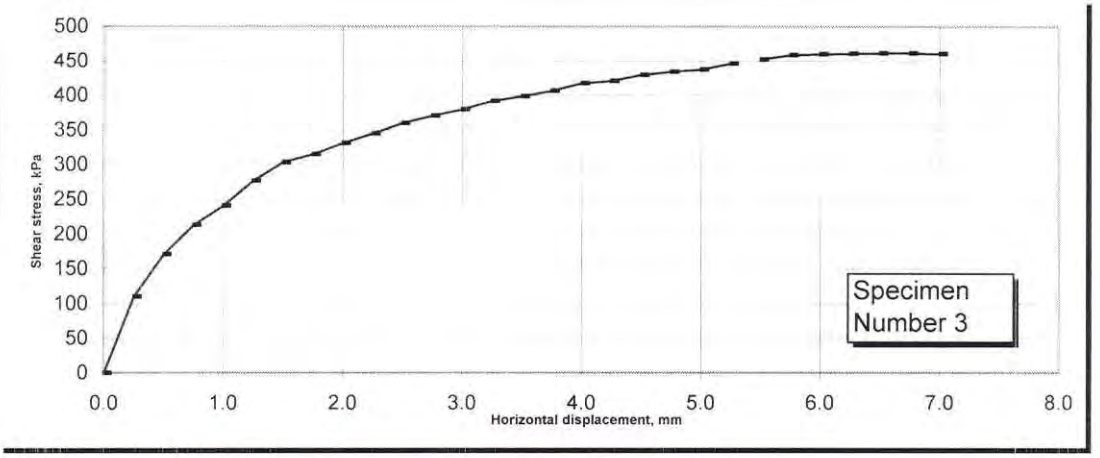
Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC936
Grey slightly silty slightly clayey gravelly SAND		**Sample size:**	**60mmx60mm**	**Depth(m):**	24.0-25.0







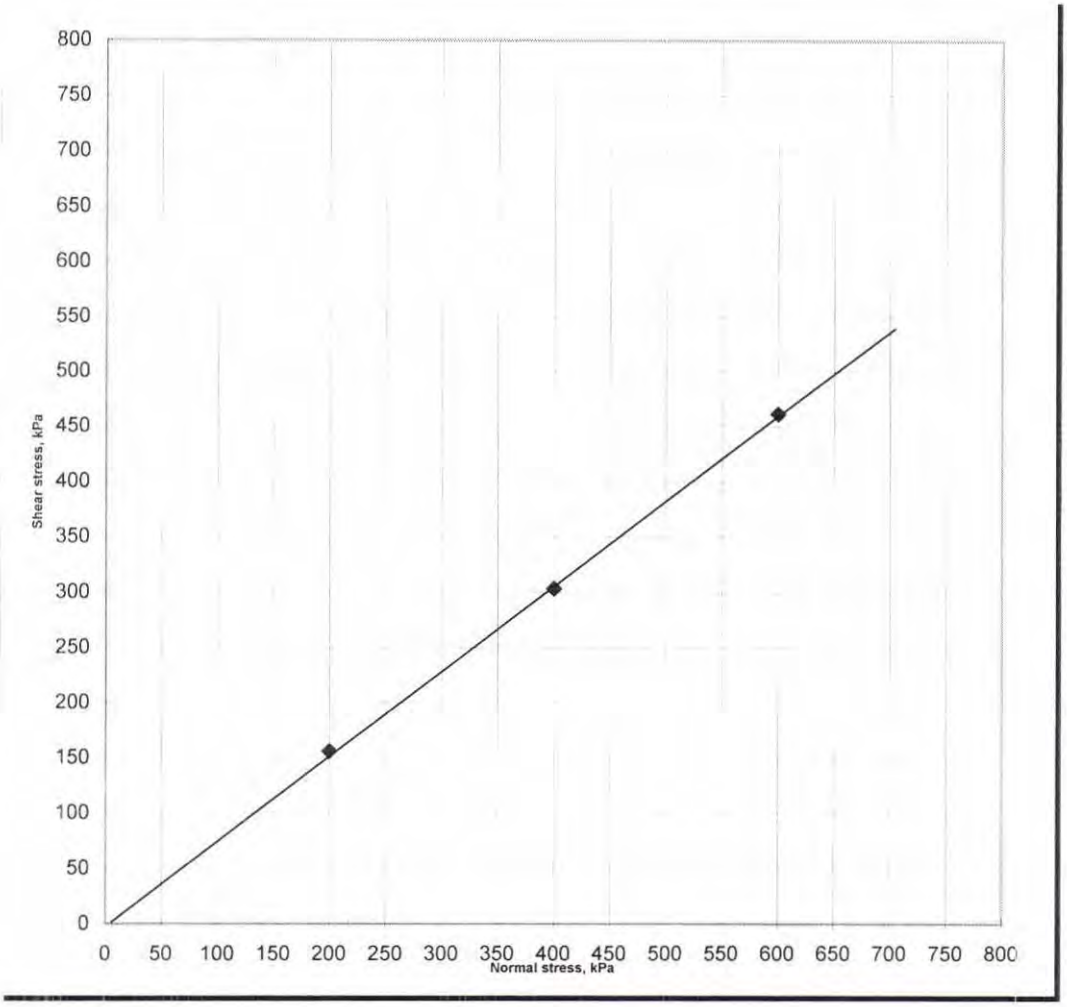
*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qua. Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address: 0		**Date received:**	12/1/2006	**K4 SOILS**	
		Date sampled:	1/4/2007		
Project Name: GCOB		**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC936
Grey slightly silty slightly clayey gravelly SAND		**Sample size:**	**60mmx60mm**	**Depth(m):**	24.0-25.0

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:			**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling			**Date sampled:**	1/4/2007	
Project Name:	GCOB		**Date tested:**	1/21/2007	
Project No: -	**Our Job / report no:**	4949	**Date reported:**	2/6/2007	
Sample description:			**Sample no/ type:**	C	**BH no:** RC936
Dark grey slightly sandy clayey SILT			**Sample size:**	60mmx60mm	**Depth(m):** 46.0-47.0

Test details

Depth within original sample : N/A
Orientation within original sample : N/A
Specimen preparation : <2mm material remoulded
Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number	:	1	2	3
Height	mm :	20	20	20
Length	mm :	60	60	60
Width	mm :	60	60	60
Bulk density	Mg/m^3 :	1.43	1.47	1.45
Moisture content	% :	23	23	23
Dry density	Mg/m^3 :	1.16	1.19	1.18
Particle density	Mg/m^3 :	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa :	250	500	750
Height at end of stage	mm :	20	20	20

Shearing Stage

Applied normal stress	kPa :	250	500	750
Rate of horizontal displacement	mm/min :	1.52	1.52	1.52
Height at end of stage	mm :	17.5	17.7	16.3
CONDITIONS AT FAILURE	*Criterion* :	Maximum shear stress		
Shear stress	kPa :	141	320	443
Horizontal relative displacement	mm :	4.50	3.25	3.25

Final specimen details

Bulk density	Mg/m^3 :	-	-	-
Moisture content	% :	39	39	33
Dry density	Mg/m^3 :	-	-	-

Shear strength parameters

Cohesion intercept,c' kPa : 0
Angle of shearing resistance,ϕ' degrees : 31.5

Notes : Specimens tested saturated.

*Set of three specimens

Rapid Shearbox Test

BS 1377 : Part 7 : Clause 4.5.4 : 1990
Determination of shear strength by direct shear (small shearbox apparatus)

Approved by
Initials : kp
Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R.(Qual.Mgr)
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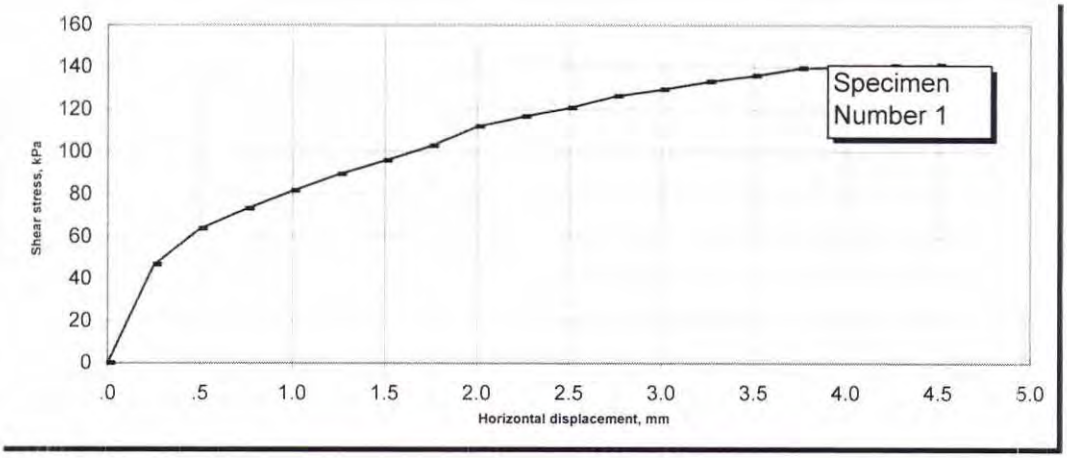
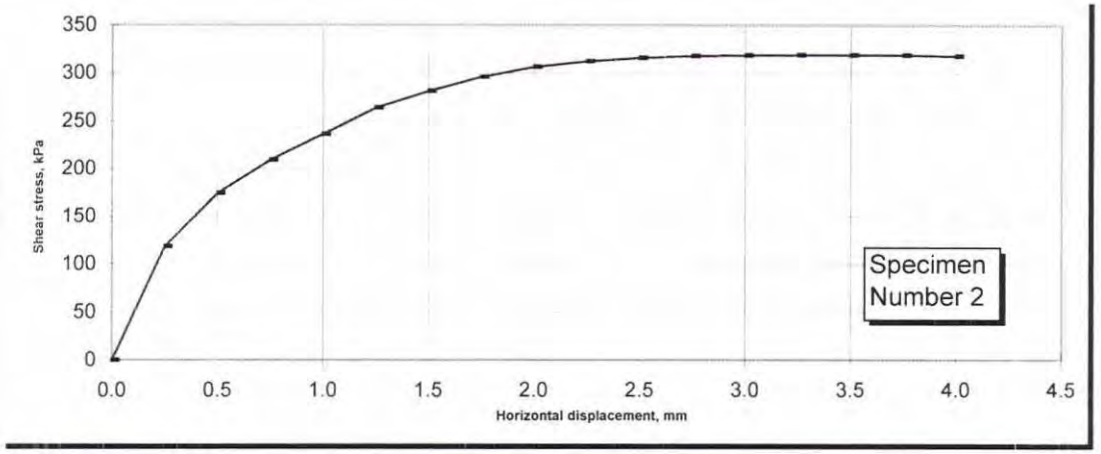
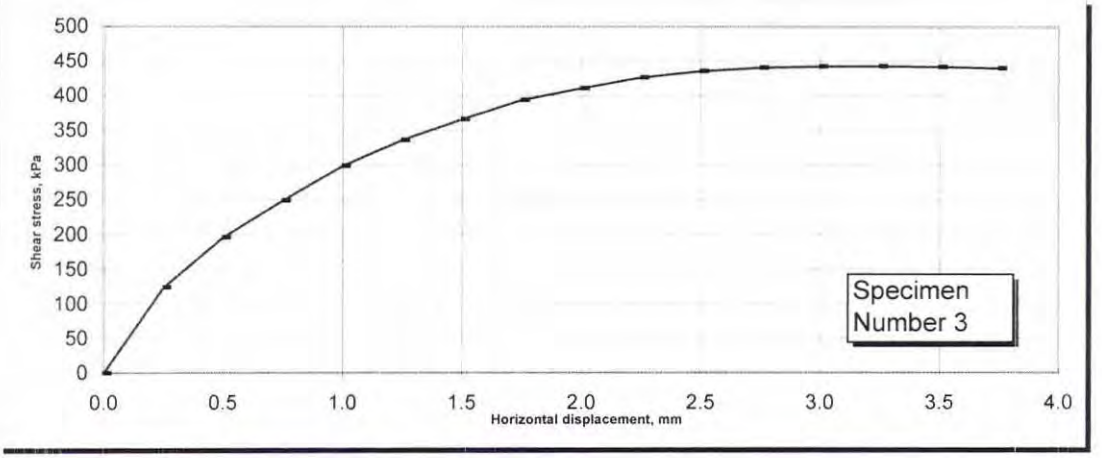
Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC936
Dark grey slightly sandy clayey SILT		**Sample size:**	**60mmx60mm**	**Depth(m):**	46.0-47.0



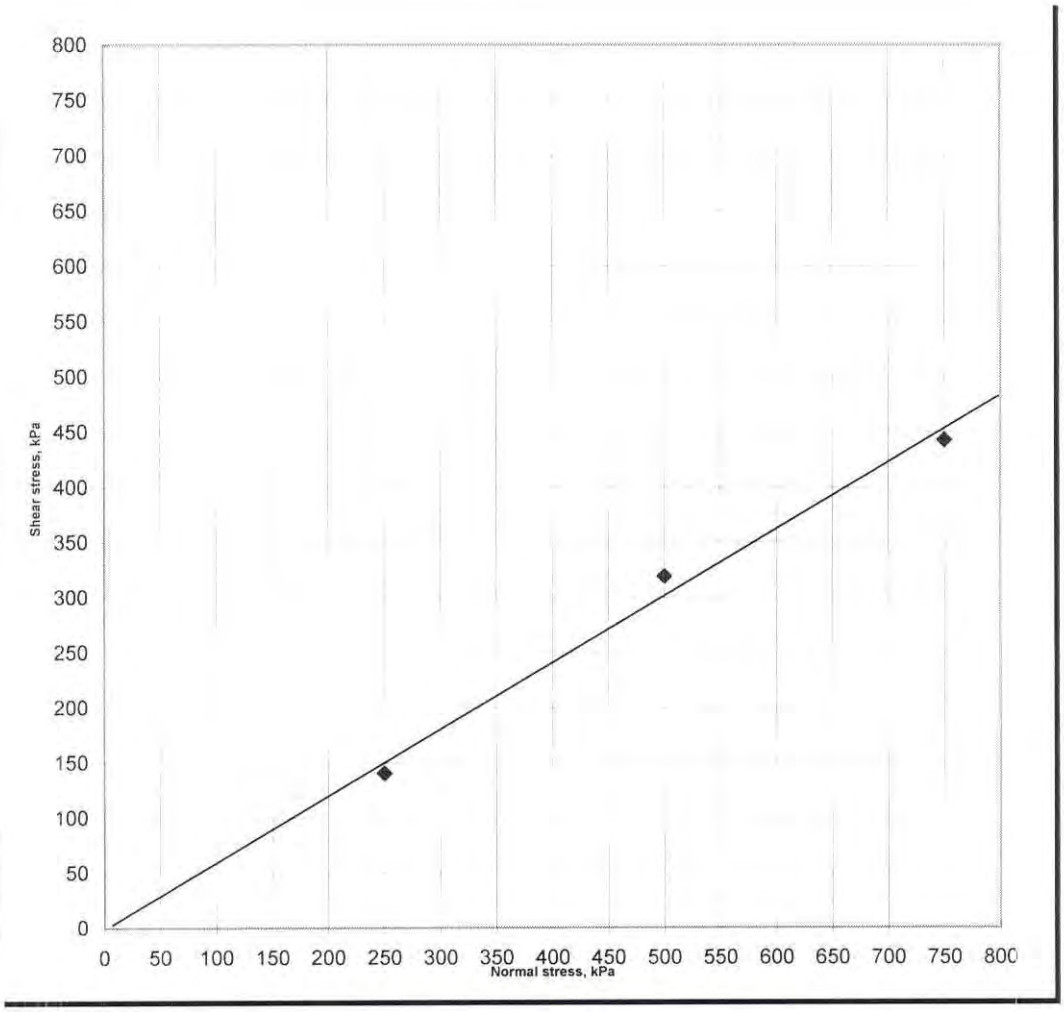




*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Client name & address: 0		**Date received:**	12/1/2006	**K4 SOILS**	
		Date sampled:	1/4/2007		
Project Name: GCOB		**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC936
Dark grey slightly sandy clayey SILT		**Sample size:**	60mmx60mm	**Depth(m):**	46.0-47.0

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual.Mgr)

All samples connected w th this report ,incl ary on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:		**Date received:**	12/1/2006
Irish Drilling		**Date sampled:**	1/4/2007
Project Name:	GCOB	**Date tested:**	1/21/2007
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007
Sample description:		**Sample no/ type:**	C
Grey clayey silty very sandy GRAVEL		**Sample size:**	60mmx60mm

K4 SOILS

BH no: RC936

Depth(m): 55.5-56.5

Test details

Depth within original sample : N/A

Orientation within original sample : N/A

Specimen preparation : <2mm material remoulded

Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number	:	1	2	3
Height	mm :	20	20	20
Length	mm :	60	60	60
Width	mm :	60	60	60
Bulk density	Mg/m^3 :	2.11	2.01	2.08
Moisture content	% :	32	32	32
Dry density	Mg/m^3 :	1.59	1.52	1.57
Particle density	Mg/m^3 :	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa :	300	600	900
Height at end of stage	mm :	20	20	20

Shearing Stage

Applied normal stress	kPa :	300	600	900
Rate of horizontal displacement	mm/min :	1.52	1.52	1.52
Height at end of stage	mm :	17.1	17.2	16.1
CONDITIONS AT FAILURE	*Criterion* :	Maximum shear stress		
Shear stress	kPa :	203	434	642
Horizontal relative displacement	mm :	4.75	7.75	5.25

Final specimen details

Bulk density	Mg/m^3 :	-	-	-
Moisture content	% :	22	17	17
Dry density	Mg/m^3 :	-	-	-

Shear strength parameters

Cohesion intercept,c'	kPa :	0
Angle of shearing resistance,ϕ'	degrees :	36.5

Notes : Specimens tested saturated.

*Set of three specimens

Rapid Shearbox Test

BS 1377 : Part 7 : Clause 4.5.4 : 1990

Determination of shear strength by direct shear (small shearbox apparatus)

Approved by

Initials : kp

Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R (Qual.Mgr)

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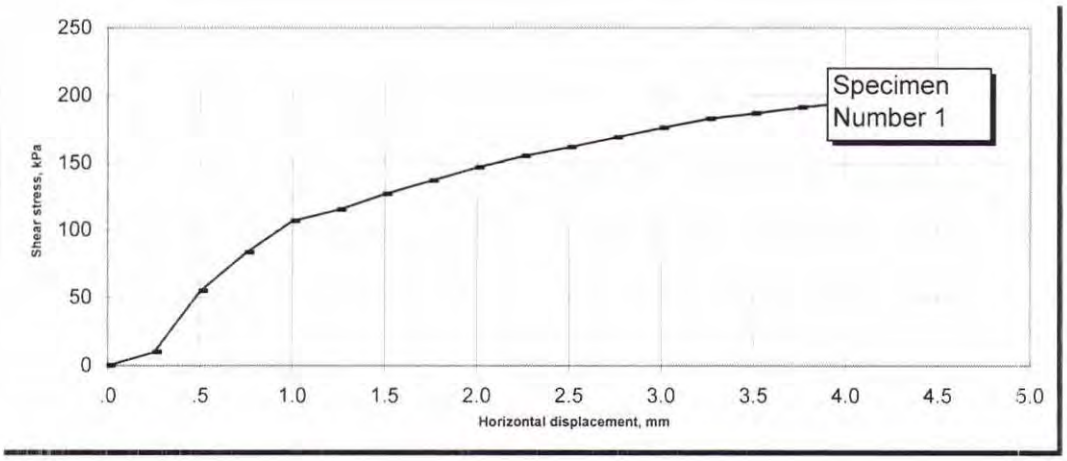
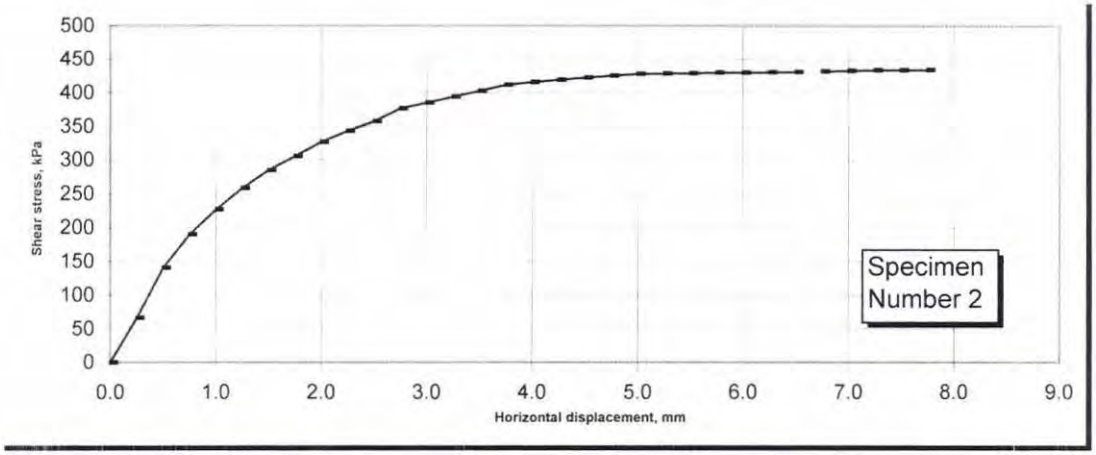
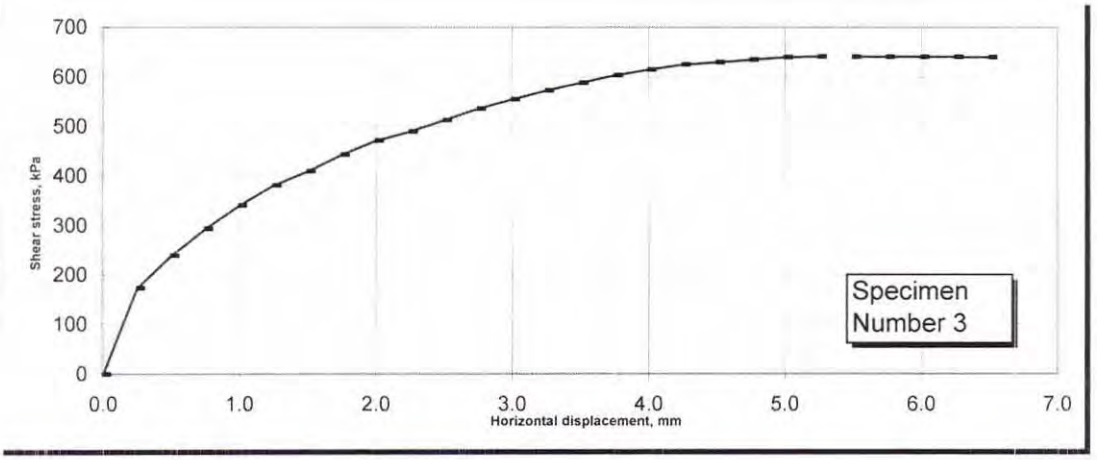
Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC936
Grey clayey silty very sandy GRAVEL		**Sample size:**	**60mmx60mm**	**Depth(m):**	55.5-56.5







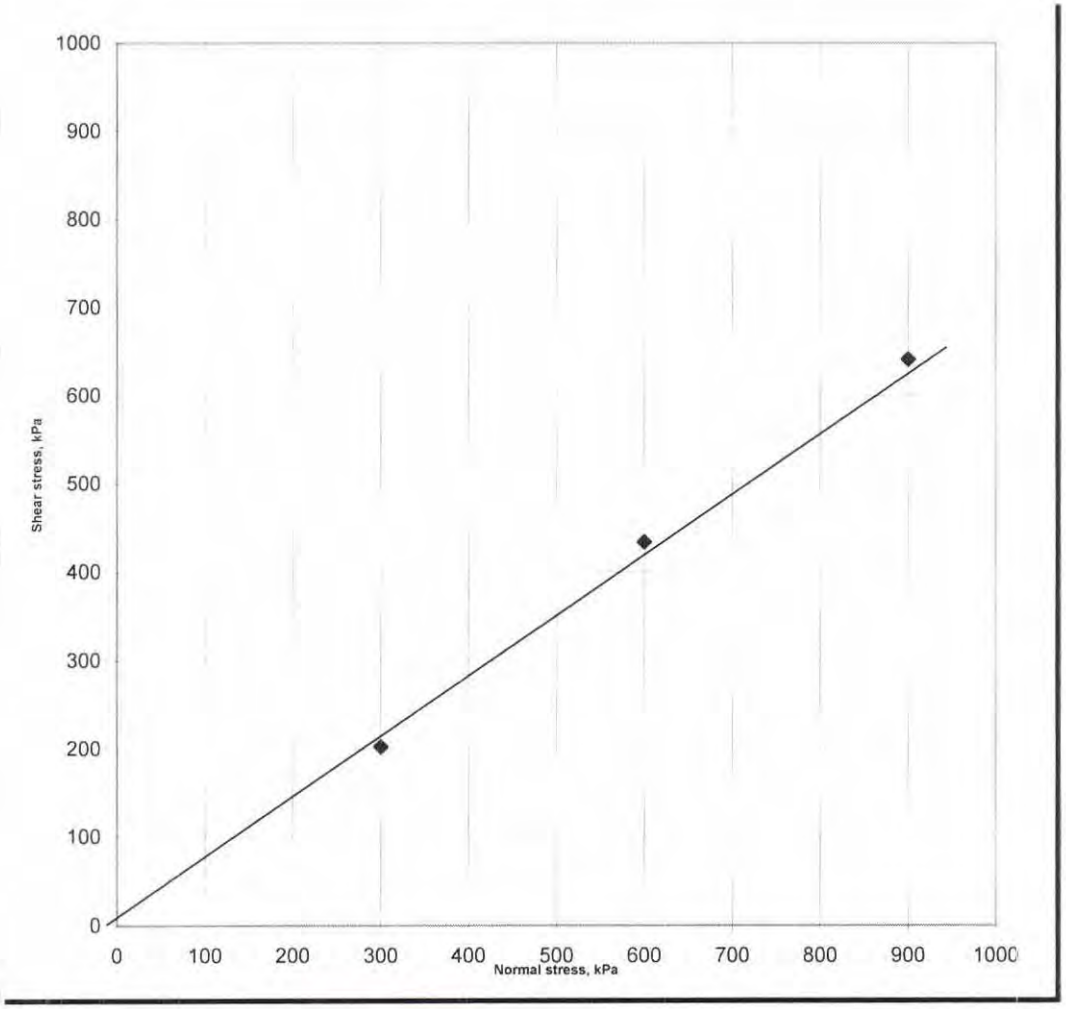
*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R (Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:	**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling	**Date sampled:**	1/4/2007	
Project Name: GCOB	**Date tested:**	1/21/2007	
Project No: - **Our Job / report no:** 4949	**Date reported:**	2/6/2007	
Sample description:	**Sample no/ type:**	C	**BH no:** RC936
Grey clayey silty very sandy GRAVEL	**Sample size:**	**60mmx60mm**	**Depth(m):** 55.5-56.5

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Report by **K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU** Sheet3/4

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R (Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request

Client name & address:		**Date received:**	12/1/2006
Irish Drilling		**Date sampled:**	1/4/2007
Project Name:	GCOB	**Date tested:**	1/21/2007
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007
Sample description:		**Sample no/ type:**	C
Dark grey slightly sandy clayey SILT		**Sample size:**	60mmx60mm

K4 SOILS

BH no: RC937

Depth(m): 26-27

Test details

Depth within original sample : N/A Orientation within original sample : N/A

Specimen preparation : <2mm material remoulded

Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number	:	1	2	3
Height	mm :	20	20	20
Length	mm :	60	60	60
Width	mm :	60	60	60
Bulk density	Mg/m^3 :	1.52	1.49	1.50
Moisture content	% :	29	29	29
Dry density	Mg/m^3 :	1.18	1.16	1.16
Particle density	Mg/m^3 :	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa :	200	400	600
Height at end of stage	mm :	20	20	20

Shearing Stage

Applied normal stress	kPa :	200	400	600
Rate of horizontal displacement	mm/min :	1.52	1.52	1.52
Height at end of stage	mm :	18.7	18.1	16.6
CONDITIONS AT FAILURE	*Criterion* :	Maximum shear stress		
Shear stress	kPa :	163	234	326
Horizontal relative displacement	mm :	3.25	6.75	7.75

Final specimen details

Bulk density	Mg/m^3 :	-	-	-
Moisture content	% :	38	45	38
Dry density	Mg/m^3 :	-	-	-

Shear strength parameters

Cohesion intercept,c'	kPa :	70
Angle of shearing resistance,ϕ'	degrees :	23.5

Notes : Specimens tested saturated.

*Set of three specimens

Rapid Shearbox Test

BS 1377 : Part 7 : Clause 4.5.4 : 1990

Determination of shear strength by direct shear (small shearbox apparatus)

Approved by

Initials : kp

Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R (Qual.Mgr)

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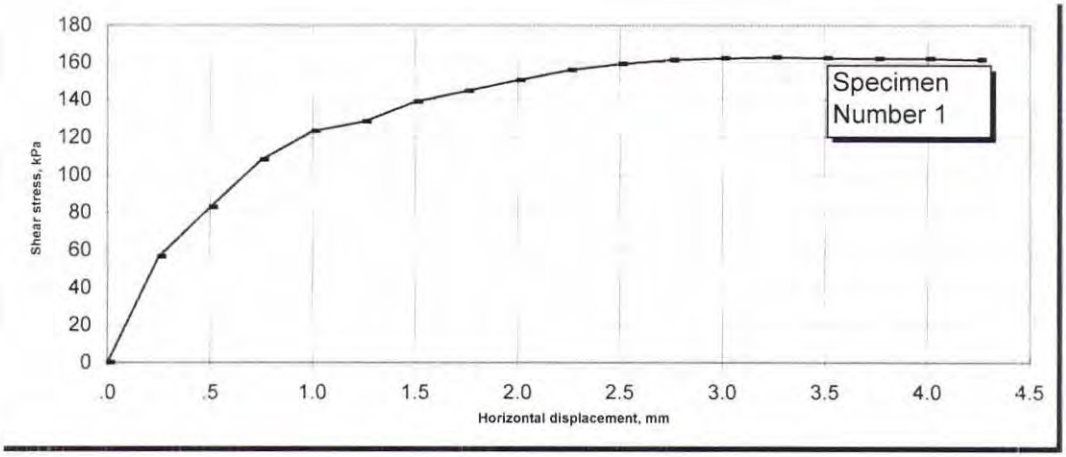
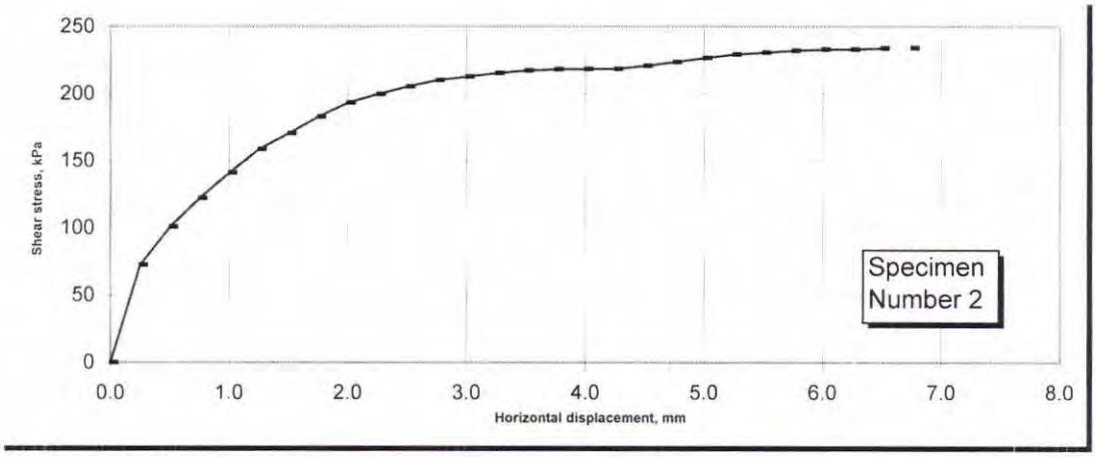
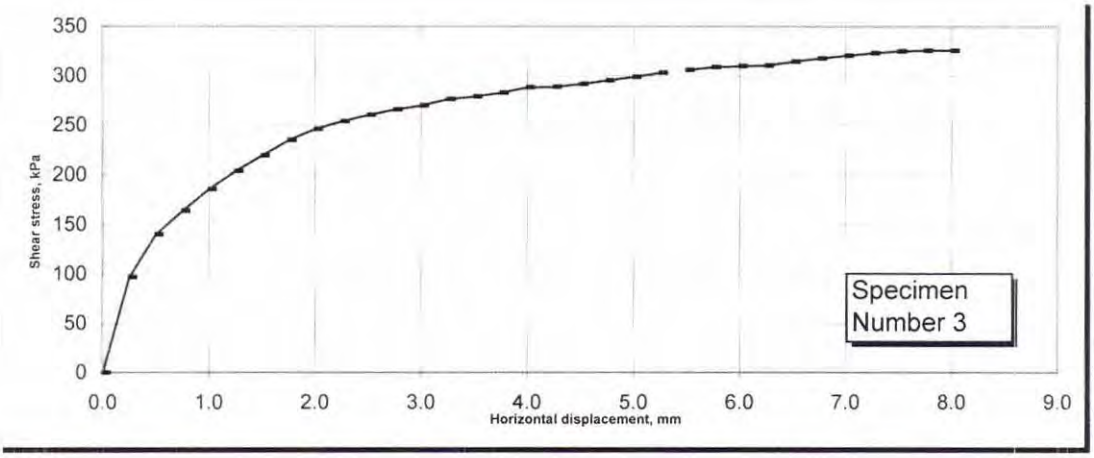
Client name & address:		**Date received:**	12/1/2006
Irish Drilling		**Date sampled:**	1/4/2007
Project Name:	GCOB	**Date tested:**	1/21/2007
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007
Sample description:		**Sample no/ type:**	C
Dark grey slightly sandy clayey SILT		**Sample size:**	60mmx60mm

K4 SOILS

BH no:	RC937
Depth(m):	26-27







*Set of three specimens

Rapid Shearbox Test

BS 1377 : Part 7 : Clause 4.5.4 : 1990

Determination of shear strength by direct shear (small shearbox apparatus)

Approved by	
Initials :	kp
Date :	2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R (Qual.Mgr)

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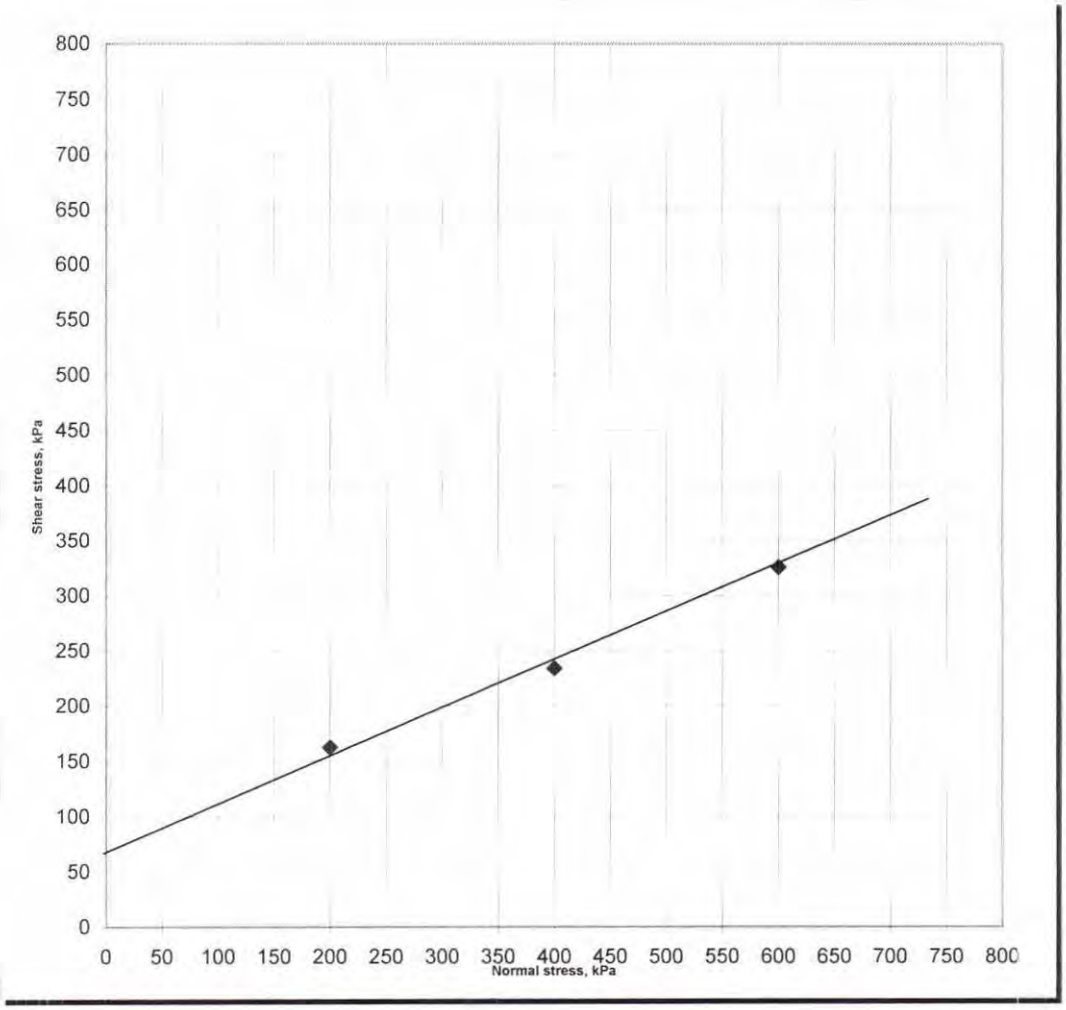
Client name & address:			**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling			**Date sampled:**	1/4/2007	
Project Name:	GCOB		**Date tested:**	1/21/2007	
Project No: -	**Our Job / report no:**	4949	**Date reported:**	2/6/2007	
Sample description:			**Sample no/ type:**	C	**BH no:** RC937
Dark grey slightly sandy clayey SILT			**Sample size:**	**60mmx60mm**	**Depth(m):** 26-27

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Report by **K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU**

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R (Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:			**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling			**Date sampled:**	1/4/2007	
Project Name:	GCOB		**Date tested:**	1/21/2007	
Project No: -	**Our Job / report no:**	4949	**Date reported:**	2/6/2007	
Sample description:			**Sample no/ type:**	C	**BH no:** RC937
Dark grey slightly sandy clayey SILT			**Sample size:**	60mmx60mm	**Depth(m):** 49-50

Test details

Depth within original sample : N/A
Orientation within original sample : N/A
Specimen preparation : <2mm material remoulded
Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number		1	2	3
Height	mm :	20	20	20
Length	mm :	60	60	60
Width	mm :	60	60	60
Bulk density	Mg/m^3 :	1.81	1.80	1.83
Moisture content	% :	14	14	14
Dry density	Mg/m^3 :	1.59	1.58	1.61
Particle density	Mg/m^3 :	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa :	300	600	900
Height at end of stage	mm :	20	20	20

Shearing Stage

Applied normal stress	kPa :	300	600	900
Rate of horizontal displacement	mm/min :	1.52	1.52	1.52
Height at end of stage	mm :	17.6	17.8	17.2
CONDITIONS AT FAILURE	*Criterion* :	Maximum shear stress		
Shear stress	kPa :	198	289	671
Horizontal relative displacement	mm :	5.75	7.50	5.00

Final specimen details

Bulk density	Mg/m^3 :	-	-	-
Moisture content	% :	22	21	18
Dry density	Mg/m^3 :	-	-	-

Shear strength parameters

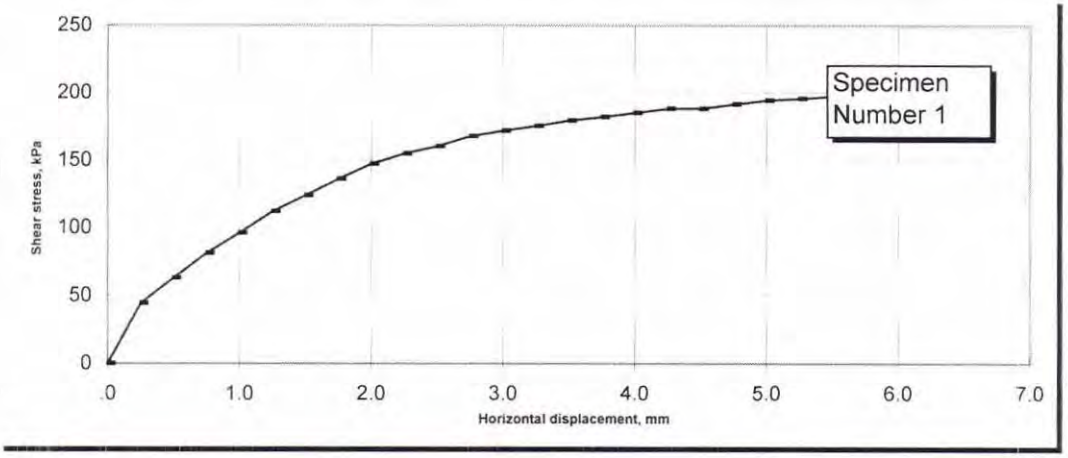
Cohesion intercept,c' kPa : 0
Angle of shearing resistance,ϕ' degrees : 36

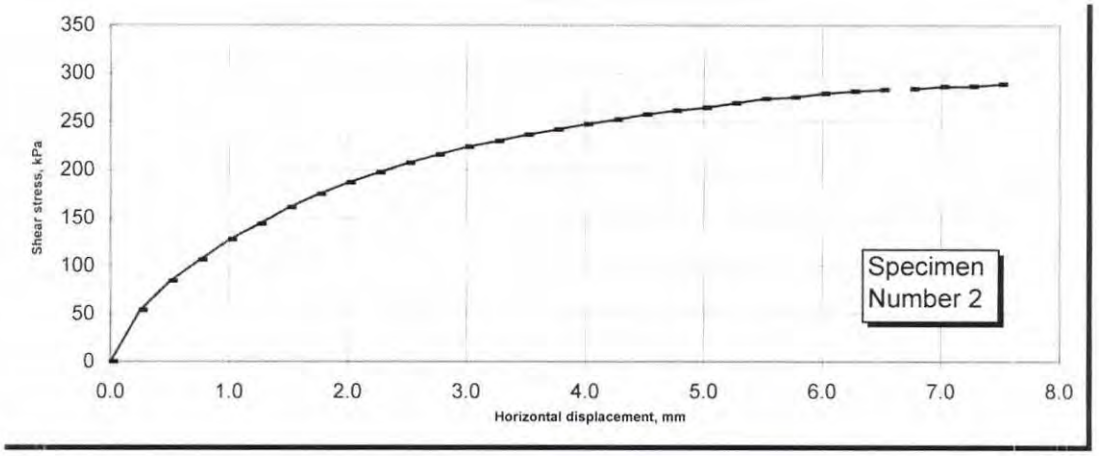
Notes : Specimens tested saturated.

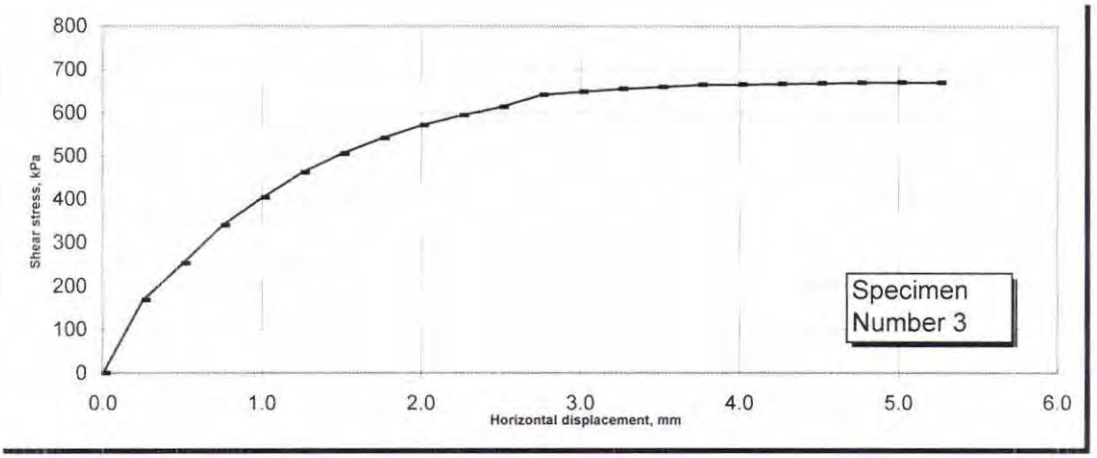
*Set of three specimens	**Rapid Shearbox Test**	Approved by
	BS 1377 : Part 7 : Clause 4.5.4 : 1990	Initials : kp
	Determination of shear strength by direct shear (small shearbox apparatus)	Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R.(Qual.Mgr)
All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC937
Dark grey slightly sandy clayey SILT		**Sample size:**	**60mmx60mm**	**Depth(m):**	49-50







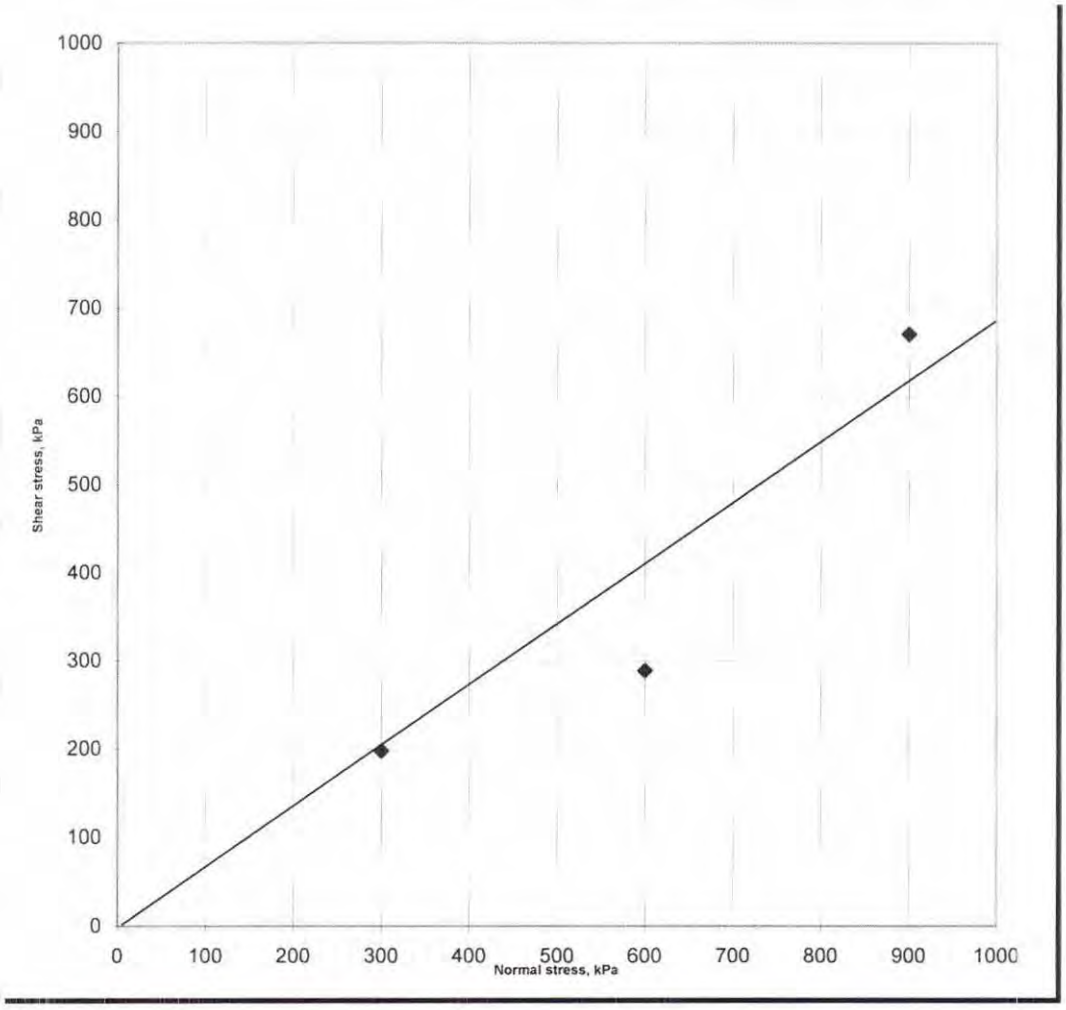
*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R (Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:			Date received:	12/1/2006	K4 SOILS	
Irish Drilling			Date sampled:	1/4/2007		
Project Name:	GCOB		Date tested:	1/21/2007		
Project No: -	Our Job / report no:	4949	Date reported:	2/6/2007		
Sample description:			Sample no/ type:	C	BH no:	RC937
Dark grey slightly sandy clayey SILT			Sample size:	60mmx60mm	Depth(m):	49-50

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	Approved by Initials : kp Date : 2/6/2007

Client name & address:			**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling			**Date sampled:**	1/4/2007	
Project Name:	GCOB		**Date tested:**	1/21/2007	
Project No: -	**Our Job / report no:**	4949	**Date reported:**	2/6/2007	
Sample description:			**Sample no/ type:**	C	**BH no:** RC940
Dark grey clayey very silty SAND			**Sample size:**	60mmx60mm	**Depth(m):** 19.0-20.0

Test details

Depth within original sample : N/A
Orientation within original sample : N/A
Specimen preparation : <2mm material remoulded
Type of Specimen Undisturbed / Remoulded / Compacted

Initial specimen details

Specimen Number	:	1	2	3
Height	mm :	20	20	20
Length	mm :	60	60	60
Width	mm :	60	60	60
Bulk density	Mg/m^3 :	1.65	1.58	1.64
Moisture content	% :	21	21	21
Dry density	Mg/m^3 :	1.36	1.30	1.35
Particle density	Mg/m^3 :	2.65	(assumed)	

Pre-Shearing Stage

Applied normal stress	kPa :	200	400	600
Height at end of stage	mm :	20	20	20

Shearing Stage

Applied normal stress	kPa :	200	400	600
Rate of horizontal displacement	mm/min :	1.52	1.52	1.52
Height at end of stage	mm :	18.6	17.4	18.5
CONDITIONS AT FAILURE	*Criterion* :	Maximum shear stress		
Shear stress	kPa :	143	250	335
Horizontal relative displacement	mm :	3.50	6.00	4.75

Final specimen details

Bulk density	Mg/m^3 :	-	-	-
Moisture content	% :	40	36	35
Dry density	Mg/m^3 :	-	-	-

Shear strength parameters

Cohesion intercept,c'	kPa :	50
Angle of shearing resistance,ϕ'	degrees :	26

Notes : Specimens tested saturated.

*Set of three specimens

Rapid Shearbox Test

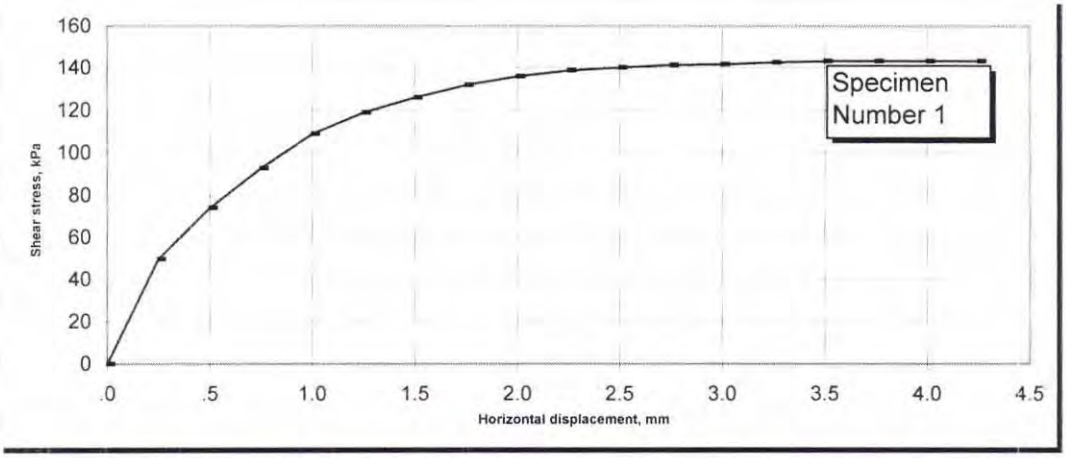
BS 1377 : Part 7 : Clause 4.5.4 : 1990

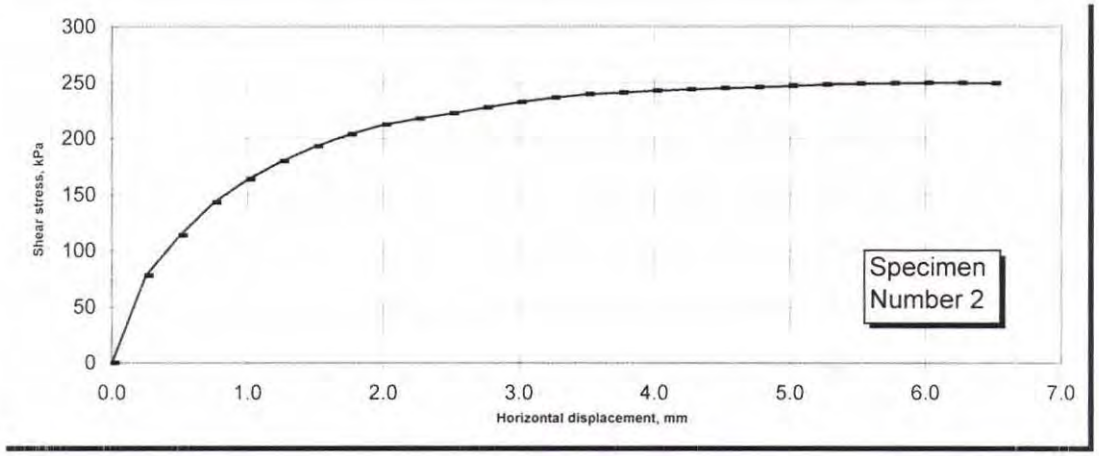
Determination of shear strength by direct shear (small shearbox apparatus)

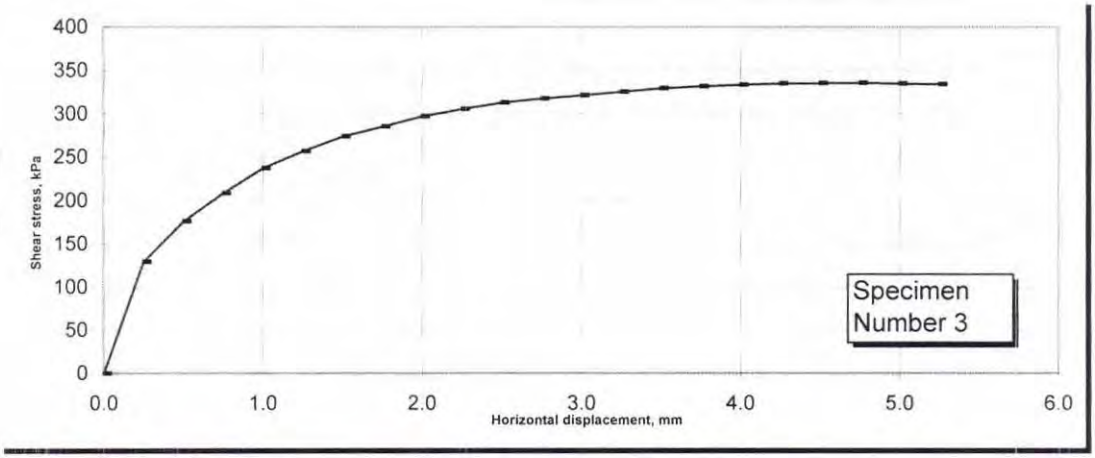
Approved by
Initials : kp
Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R (Qual.Mgr)
All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request.

Client name & address:		**Date received:**	12/1/2006	**K4 SOILS**	
Irish Drilling		**Date sampled:**	1/4/2007		
Project Name:	GCOB	**Date tested:**	1/21/2007		
Project No: -	**Our Job / report no:** 4949	**Date reported:**	2/6/2007		
Sample description:		**Sample no/ type:**	C	**BH no:**	RC940
Dark grey clayey very silty SAND		**Sample size:**	**60mmx60mm**	**Depth(m):**	19.0-20.0







*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual.Mgr)

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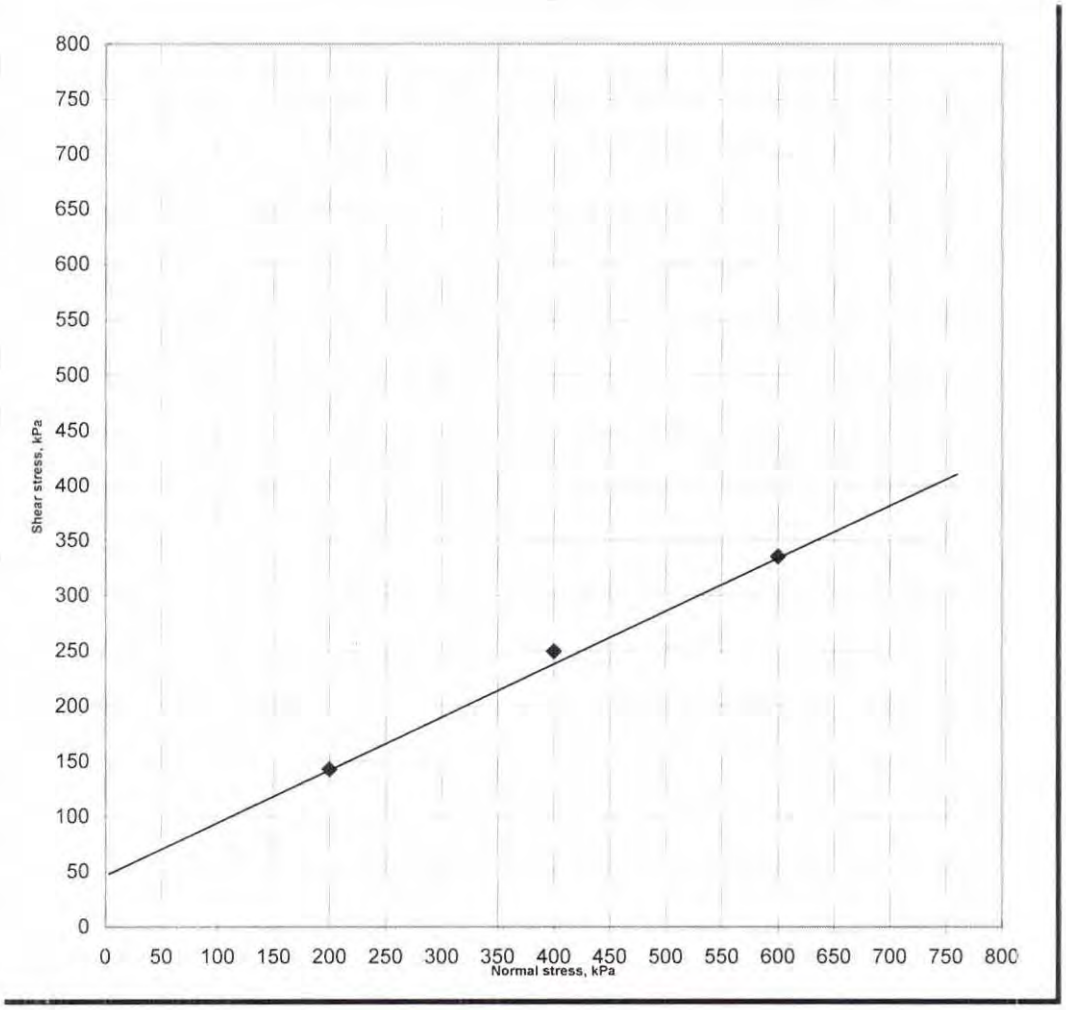
Client name & address:	**Date received:**	12/1/2006	**K4 SOILS**
Irish Drilling	**Date sampled:**	1/4/2007	
Project Name: GCOB	**Date tested:**	1/21/2007	
Project No: - **Our Job / report no:** 4949	**Date reported:**	2/6/2007	
Sample description:	**Sample no/ type:**	C	**BH no:** RC940
Dark grey clayey very silty SAND	**Sample size:**	**60mmx60mm**	**Depth(m):** 19.0-20.0

Shear Stress vs Normal Stress



*Set of three specimens	**Rapid Shearbox Test** BS 1377 : Part 7 : Clause 4.5.4 : 1990 Determination of shear strength by direct shear (small shearbox apparatus)	**Approved by** Initials : kp Date : 2/6/2007

Test Report by **K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU** Sheet3/4

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.A copy of this policy is available on request

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274 Fax: (091) 847687

Contract: N6 Galway City Outer Bypass
Client:
Engineer:
Date: 13/12/2006
Tested by: EAT Checked: DJ

Point Load Tests

Borehole	Depth	D	W	De^2	P	Is MPa	F	$Is_{(50)}$ MPa	UCS MPa	Remarks
RC 510	1.6-1.8	63	63	3969	24.10	6.07	1.110	6.74	165.07	Very Strong
RC 510	3.6-3.87	63	63	3969	25.50	6.42	1.110	7.13	174.66	Very Strong
RC 511	2.5-2.8	63.38	63.4	4017	29.90	7.44	1.113	8.28	202.90	Extremely Strong
RC 513	0.3-0.63	63	63	3969	27.00	6.80	1.110	7.55	184.93	Very Strong
RC 513	1.5-1.8	63	63	3969	21.70	5.47	1.110	6.07	148.63	Very Strong
RC 515	2.85-3.0	63	63	3969	33.80	8.52	1.110	9.45	231.51	Extremely Strong
RC 515	3.15-3.31	63	63	3969	30.40	7.66	1.110	8.50	208.22	Extremely Strong
RC 548	3.25-3.55	63	63	3969	36.50	9.20	1.110	10.20	250.00	Extremely Strong
RC 595	1.7-1.97	63	63	3969	8.95	2.25	1.110	2.50	61.30	Strong
RC 595	2.8-3.0	63	63	3969	4.10	1.03	1.110	1.15	28.08	Moderately Strong
RC 638	2.2-2.36	63.55	63.6	4038.6	17.50	4.33	1.114	4.83	118.26	Very Strong
RC 638	3.75-3.9	63.77	63.8	4066.6	15.25	3.75	1.116	4.18	102.50	Very Strong

Irish Drilling Ltd.

Borehole	Depth	D	W	De^2	P	Is	F	$Is_{(50)}$	UCS	Remarks	
						MPa		MPa	MPa		
RC 830	12.7-13.0										No suitable sample.
RC 830	14.75-14.89	63	63	3969	5.05	1.27	1.110	1.41	34.59	Moderately Strong	
RC 830	17.25-17.49	62	62	3844	3.25	0.85	1.102	0.93	22.82	Moderately Strong	
RC 830	18.6-18.75	62	62	3844	7.85	2.04	1.102	2.25	55.12	Strong	
RC 839	2.3-2.49	62.5	62.5	3906.3	17.85	4.57	1.106	5.05	123.78	Very Strong	
RC 839	3.95-4.36	63	63	3969	17.05	4.30	1.110	4.77	116.78	Very Strong	
RC 839	5.8-6.1	63	63	3969	13.00	3.28	1.110	3.63	89.04	Strong	
RC 839	7.0-7.28	62.5	62.5	3906.3	19.25	4.93	1.106	5.45	133.49	Very Strong	
RC 898	3.0-3.18	62	62	3844	19.30	5.02	1.102	5.53	135.51	Very Strong	
RC 898	3.85-4.24	62.5	62.5	3906.3	18.95	4.85	1.106	5.36	131.41	Very Strong	
RC 903	6.0-6.2	62.5	62.5	3906.3	19.55	5.00	1.106	5.53	135.57	Very Strong	
RC 910	4.3-4.64	63	63	3969	22.30	5.62	1.110	6.23	152.74	Very Strong	
RC 910	7.1-7.33	63	63	3969	19.30	4.86	1.110	5.40	132.19	Very Strong	
RC 912	11.2-11.36	63	63	3969	13.85	3.49	1.110	3.87	94.86	Strong	
RC 912	16.21-16.5	63	63	3969	15.75	3.97	1.110	4.40	107.88	Very Strong	
RC 912	16.9-17.18	62.5	62.5	3906.3	17.40	4.45	1.106	4.92	120.66	Very Strong	
RC 914	7.15-7.36	63	63	3969	7.80	1.97	1.110	2.18	53.43	Strong	
RC 914	9.0-9.31	62.5	62.5	3906.3	19.50	4.99	1.106	5.52	135.22	Very Strong	
RC 914	10.6-10.75	63	63	3969	17.50	4.41	1.110	4.89	119.86	Very Strong	
RC 916	8.3-8.6	63	63	3969	15.90	4.01	1.110	4.45	108.91	Very Strong	
RC 916	10.5-11.0										No suitable sample.
RC 916	11.18-11.21	63	63	3969	22.35	5.63	1.110	6.25	153.08	Very Strong	
RC 916	11.8-12.0	63	63	3969	17.60	4.43	1.110	4.92	120.55	Very Strong	
RC 916	13.5-13.7	63	63	3969	17.80	4.48	1.110	4.98	121.92	Very Strong	

Borehole	Depth	D	W	De^2	P	Is	F	$Is_{(50)}$	UCS	Remarks
						MPa		MPa	MPa	
RC 926	2.73-3.0	63.3	63.3	4006.9	22.95	5.73	1.112	6.37	156.04	Very Strong
RC 926	5.22-5.39	63.38	63.4	4017	8.7	2.17	1.113	2.41	59.04	Strong
RC 926	8.25-8.5	63.35	63.4	4013.2	17.9	4.46	1.112	4.96	121.56	Very Strong
RC 933	11.55-11.71	63.36	63.4	4014.5	18.8	4.68	1.112	5.21	127.64	Very Strong
RC 936	59.0-59.28	47.57	47.6	2262.9	14.1	6.23	0.978	6.09	149.27	Very Strong
RC 936	63.35-63.65	47.47	47.5	2253.4	14.85	6.59	0.977	6.44	157.73	Very Strong
RC 937	78.1-78.23	42.51	42.5	1807.1	15.05	8.33	0.930	7.74	189.67	Very Strong
RC 937	83.56-83.87	42.35	42.4	1793.5	12.15	6.77	0.928	6.29	154.02	Very Strong
RC 940	22.37-22.5	63.59	63.6	4043.7	22.5	5.56	1.114	6.20	151.90	Very Strong
RC 940	24.0-24.31	63.35	63.4	4013.2	17.4	4.34	1.112	4.82	118.16	Very Strong
RC 942	5.05-5.33	63.06	63.1	3976.6	17.95	4.51	1.110	5.01	122.77	Very Strong
RC 942	7.5-7.62	63.63	63.6	4048.8	12.55	3.10	1.115	3.45	84.64	Strong
RC 942	12.0-12.21	63.06	63.1	3976.6	19.7	4.95	1.110	5.50	134.73	Very Strong
RC 942	16.5-16.78	63.02	63	3971.5	15.45	3.89	1.110	4.32	105.77	Very Strong
RC 950	2.71-2.9	63	63	3969	17.65	4.45	1.110	4.93	120.89	Very Strong
RC 950	4.5-4.83	63	63	3969	24.05	6.06	1.110	6.72	164.73	Very Strong
RC 952	2.8-3.0	63	63	3969	11.20	2.82	1.110	3.13	76.71	Strong
RC 952	4.45-4.63	63	63	3969	18.20	4.59	1.110	5.09	124.66	Very Strong
RC 954	2.73-2.89	63	63	3969	17.80	4.48	1.110	4.98	121.92	Very Strong
RC 954	3.52-3.71	63	63	3969	14.00	3.53	1.110	3.91	95.89	Strong
RC 959	2.9-3.06	62.61	62.6	3920	2.10	0.54	1.107	0.59	14.52	Moderately Strong
RC 959	4.0-4.16	62.56	62.6	3913.8	13.60	3.47	1.106	3.84	94.17	Strong
RC 959	5.5-5.7	62.61	62.6	3920	13.60	3.47	1.107	3.84	94.05	Strong
RC 959	6.4-6.63	62.64	62.6	3923.8	14.60	3.72	1.107	4.12	100.89	Very Strong
RC 959	7.75-8.05	62.64	62.6	3923.8	16.40	4.18	1.107	4.63	113.33	Very Strong
RC 959	10.0-10.3	62.79	62.8	3942.6	20.10	5.10	1.108	5.65	138.39	Very Strong

Irish Drilling Ltd.

Borehole	Depth	D	W	De^2	P	Is	F	$Is_{(50)}$	UCS	Remarks	
						MPa		MPa	MPa		
RC 959 A	5.3-6.5										No suitable sample.
RC 959 A	7.8-8.0	61.5	61.5	3782.3	17.00	4.49	1.098	4.93	120.87	Very Strong	
RC 961	0.9-1.03	62.5	62.5	3906.3	6.60	1.69	1.106	1.87	45.77	Moderately Strong	
RC 961	2.0-2.13	62	62	3844	15.15	3.94	1.102	4.34	106.37	Very Strong	
RC 968	1.35-1.5	63	63	3969	3.90	0.98	1.110	1.09	26.71	Moderately Strong	
RC 968	1.68-1.77	63	63	3969	9.70	2.44	1.110	2.71	66.44	Strong	
RC 970	4.5-4.75	61.5	61.5	3782.3	20.90	5.53	1.098	6.07	148.60	Very Strong	
RC 972	3.5-3.65	63.45	63.5	4025.9	18.45	4.58	1.113	5.10	124.98	Very Strong	
RC 972	5.0-5.24	63.73	63.7	4061.5	17.2	4.23	1.115	4.72	115.72	Very Strong	
RC 973	3.1-3.3										No suitable sample:RQD=0
RC 973	4.5-4.73	63.27	63.3	4003.1	22.55	5.63	1.112	6.26	153.43	Very Strong	
RC 977	3.6-3.88	63	63	3969	13.50	3.40	1.110	3.77	92.47	Strong	
RC 977	5.6-5.8	63	63	3969	9.40	2.37	1.110	2.63	64.38	Strong	
RC 979	1.87-2.0	62.69	62.7	3930	17.35	4.41	1.107	4.89	119.75	Very Strong	
RC 979	2.0-2.17	62.64	62.6	3923.8	18.30	4.66	1.107	5.16	126.46	Very Strong	
RC 981	1.84-2.0	63.52	63.5	4034.8	13.20	3.27	1.114	3.64	89.27	Strong	
RC 981	3.07-3.2	63.51	63.5	4033.5	18.65	4.62	1.114	5.15	126.15	Very Strong	Nearest suitable sample
RC 981	3.2-4.7										No suitable sample
RC 982	1.9-2.04	62.5	62.5	3906.3	9.05	2.32	1.106	2.56	62.76	Strong	
RC 982	3.15-3.37	63	63	3969	17.45	4.40	1.110	4.88	119.52	Very Strong	
RC 985	0.8-1.4										No suitable sample.
RC 985	2.33-2.47	63	63	3969	4.85	1.22	1.110	1.36	33.22	Moderately Strong	
RC 986	0.4-1.5										No suitable sample.
RC 986	3.1-3.3	62.5	62.5	3906.3	16.65	4.26	1.106	4.71	115.46	Very Strong	
RC 986	5.73-6.0	62.5	62.5	3906.3	16.60	4.25	1.106	4.70	115.11	Very Strong	

Irish Drilling Ltd

Unconfined Compressive Strength of rock cores

Project Name:		**N6 Galway City Outer Bypass**					Date: **01/12/2006**				
Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Weight (g) IN AIR	Weight (g) IN WATER	Bulk Density Mg/m3	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (Mpa)	
RC 0510	3.06-3.33	63.32	182.74	1537	947	2.605	557	SHATTERED	401.50	127.400	Very Strong
RC 0511	2.8-3.0	63.43	182.20	1531	944	2.608	963	Diagonal shear	247.60	78.340	Strong
RC 0548	3.4-3.59	63.45	156.37	1318	807	2.579	644	Explosive Shear	435.10	137.600	Very Strong
RC 0638	3.17-3.37	63.47	178.40	1500	922	2.595	528	Vertical Shear	234.10	73.950	Strong
RC 0640	2.8-3.0	63.69	160.9	1345	826	2.592	593	Fractured Shear	166.6	52.27	Strong
RC 0687	4.3-4.51	63.54	180.94	1495	910	2.556	526	Explosive Shear	344.60	108.650	Very Strong
RC 0689	5.98-6.26	63.52	192.49	1598	976	2.56	596	Explosive Shear	255.80	80.690	Strong
RC 0694	2.95-3.2	63.60	201.95	1716	1060	2.615	379	Vertical Shear	191.40	60.230	Strong
RC 0694	4.22-4.43	63.48	192.90	1614	989	2.582	618	Explosive Shear	313.80	99.110	Strong
RC 0707	2.85-3.0	*63.24*	*139.44*	1150	694	2.521	581	Diagonal shear	126.30	40.190	Moderately Strong
RC 0733 A	6.55-6.75	63.53	181.90	1491	905	2.544	312	Vertical Shear	194.60	61.360	Strong
RC 0734	4.0-4.26	63.83	180.81	1504	920	2.575	375	Diagonal shear	82.60	25.800	Moderately Strong

Project Name:		N6 Galway City Outer Bypass					Date: 01/12/2006				
Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Weight (g) IN AIR	Weight (g) IN WATER	Bulk Density Mg/m3	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (Mpa)	
RC 0813	10.6-10.73	63.67	153.57	1258	763	2.54	581	Vertical Shear	154.8	48.6	Moderately Strong
RC 0813	5.9-6.4	*63.59*	*124.68*	1023	620	2.538	630	Vertical Shear	117.8	37.08	Moderately Strong
RC 0814	3.73-3.8	*63.36*	*108.87*	893	541	2.54	177	Lateral Shear	81.10	25.710	Moderately Strong
RC 0814	7.5-7.63	*63.38*	*135.04*	1112	673	2.533	223	Diagonal shear	44.40	14.060	Moderately Strong
RC 0817	10.25-10.43	63.45	175.90	1435	869	2.540	359	Vertical Shear	100.30	31.700	Moderately Strong
RC 0817	4.2-4.38	64	164.215	1344	815	2.54	278	Lateral Shear along Vein	30.3	9.41	Moderately Weak
RC 0818	6.21-6.4	*63.62*	*149.29*	1233	753	2.56	1048	Core Exploded	483	151.9	Very Strong
RC 0819	5.74-5.96	62.99	172.91	1432	881	2.598	721	Vertical Shear	236.30	75.790	Strong
RC 0827	14.45-14.75	62.93	178.09	1496	924	2.615	543	Vertical Shear	283.60	91.140	Strong
RC 0910	5.6-5.93	63.96	180.84	1520	942	2.629	610	Explosive Shear	188.90	60.600	Strong
RC 0910	8.72-9.06	63.38	182.82	1551	964	2.642	632	Vertical Shear	141.10	44.710	Moderately Strong
RC 0912	12.0-12.16	*63.29*	*140.50*	1144	688	2.509	481	Vertical Shear	134.80	42.800	Moderately Strong
RC 0912	14.6-15.0	63.27	187.41	1570	973	2.629	548	Vertical Shear	165.00	52.400	Strong
RC 0914	5.66-6.0	63.17	182.90	1549	962	2.639	542	Vertical Shear	120.60	38.470	Moderately Strong
RC 0914	8.64-9.0	63.34	184.70	1560	967	2.631	638	Vertical Shear	161.20	51.150	Strong
RC 0916	11.4-11.65	63.24	177.90	1496	927	2.629	639	Vertical Shear	221.70	70.500	Strong

Project Name:		N6 Galway City Outer Bypass					Date: 01/12/2006				
Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Weight (g) IN AIR	Weight (g) IN WATER	Bulk Density Mg/m3	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (Mpa)	
RC 0916	9.23-9.54	63.28	183.70	1575	987	2.679	356	Vertical Shear	243.80	77.480	Strong
RC 0924	2.95-3.25	*63.55*	*132.45*	1118	690	2.612	444	SHATTERED	408.70	128.800	Very Strong
RC 0924	5.6-5.84	*63.17*	*135.96*	1147	709	2.618	634	SHATTERED	251.40	80.180	Strong
RC 0925	5.02-5.24	*62.97*	*132.38*	1117	688	2.604	393	Explosive Shear	324.70	104.200	Very Strong
RC 0926	5.0-5.22	*63.33*	*136.50*	1145	707	2.614	454	Explosive Shear	245.80	78.013	Strong
RC 0940	21.8-22.0	*63.17*	*134.78*	1131	697	2.533	470	Explosive Shear	215.80	68.830	Strong
RC 0942	13.5-13.77	*63.19*	*133.43*	1119	691	2.614	313	SHATTERED	216.50	69.000	Strong
RC 0942	7.62-7.79	*63.16*	*133.46*	1115	687	2.605	413	Explosive Shear	313.40	99.980	Strong
RC 0950	3.85-4.12	*63.37*	*121.25*	1.032	632	2.58	676	Vertical Shear	202.40	64.150	Strong
RC 0952	1.9-2.11	63.57	183.11	1566	971	2.632	516	SHATTERED	240.80	75.850	Strong
RC 0954	3.3-3.5	63.51	176.50	1495	921	2.605	406	Vertical Shear	293.70	92.670	Strong
RC 0959	6.78-6.95	63.78	180.88	1521	938	2.609	683	Vertical Shear	168.80	52.810	Strong
RC 0968	2.23-2.44	63.37	170.11	1438	884	2.596	672	Diagonal shear	189.20	59.960	Strong
RC 0970	3.29-3.5	62.09	166.06	1263	768	2.552	213	Diagonal shear	71.80	23.700	Moderately Strong

Project Name:		N6 Galway City Outer Bypass					Date: 01/12/2006				
Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Weight (g) IN AIR	Weight (g) IN WATER	Bulk Density Mg/m3	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (Mpa)	
RC 0972	3.3-3.5	*63.30*	*134.37*	1137	701	2.608	860	SHATTERED	403.40	127.970	Very Strong
RC 0973	3.75-3.93	*63.39*	*133.90*	1126	693	2.6	612	Explosive Shear	183.60	127.800	Very Strong
RC 0986	2.7-2.88	*63.11*	*124.43*	1023	621	2.545	404	Vertical Shear	120.80	38.600	Moderately Strong
RC 0988	3.7-3.9	63.17	185.97	1563	968	2.627	652	Vertical Shear	151.8	48.42	Moderately Strong
RC 0990	2.3-2.47	63.84	171.35	1440	893	2.633	1044	Core Exploded	304.1	94.97	Strong
RC 0990	6.1-6.3	63.31	181.1	1520	941	2.625	392	Vertical Shear	139.9	44.42	Moderately Strong
RC 0991	12.6-12.85	63.53	181.59	1528	947	2.629	315	Fractured Shear	71.9	22.67	Moderately Strong
RC 0991	4.5-4.68	63.25	154.26	1294	799	2.614	781	Vertical Shear	266.4	84.76	Strong
RC 0991	7.4-7.58	63.42	160.75	1348	833	2.617	525	Fractured Shear	196.1	62.06	Strong
RC 0993	4.4-4.59	*63.26*	*133.64*	1122	691	2.603	587	Explosive Shear	275.30	87.560	Strong
RC 1002	4.1-4.16	63.17	153.42	1282	789	2.6	605	Vertical Shear	173.10	55.200	Strong
RC 1067	2.86-3.1	63.29	184.30	1558	964	2.623	384	Diagonal shear	83.00	26.370	Moderately Strong
RC 1075	3.81-4.0	63.51	169.09	1419	879	2.629	310	Vertical Shear	291.50	91.990	Strong
RC 1077	3.69-3.92	63.23	183.95	1547	959	2.631	653	Vertical Shear	173.60	55.270	Strong

TEN PERCENT FINES VALUE
BS812 : PART III : 1990

SAMPLE REFERENCE	10% FINES VALUE	DESCRIPTION
RC972	210	Grey GRANITE

		Input by	Date	Checked by	Date		
			21/12/2006		23.1.07		
FUGRO	Project	N6 GCOB				Contract No	IRE065058
						Figure No	Pg 4 of 4

Product Support Laboratory

Tarmac

Tarmac Northern Ltd
Product Support Laboratory
Coxhoe Quarry, Coxhoe
Co. Durham, DH6 4BB

Test Report Number :

Client Details : **Fugro Engineering Services Ltd**

Details of the Submitted Sample :

Sample Number :	C/2104	Client Reference :	IRE 065058
Material :	Rock Cores		
Source :	RC 510		
Sampled at :	1.8m		
Date Received :	05-Jan-07	Date Sampled :	Not Specified

.ıe sample was not accompanied by a certificate of sampling

Test Procedure : BS 812, Testing Aggregate
Part 111:1990, Methods for the Determination of Ten per cent fines Value
Clause 7.1,Aggregates in Dry Condition

Test Results :

Ten percent Fines Value	210	(TFV)

Signature :
(and printed name) C Abbott
Materials Technologist

Date of Test : 10-Jan-07
Date of Report : 29-Jan-07

1) This report only relates to the submitted sample.
2) This report must be reproduced in full.
3) The remainder of the submitted sample will be retained for twenty eight days from the date give above, unless specific arrangements are agreed with the laboratory manager.
4) Test's marked ' Not UKAS' in this report are not included in the UKAS accreditation schedule for this laboratory

Product Support Laboratory

Tarmac Northern Ltd
Product Support Laboratory
Coxhoe Quarry, Coxhoe
Co. Durham, DH6 4BB

Test Report Number :

Client Details : **Fugro Engineering Services Ltd**

Details of the Submitted Sample :

Sample Number :	C/2119	Client Reference :	IRE 065058
Material :	Rock Cores		
Source :	RC 972		
Sampled at :	1.9m		
Date Received :	05-Jan-07	Date Sampled :	Not Specified

The sample was not accompanied by a certificate of sampling

Test Procedure : BS 812, Testing Aggregate
Part 111:1990, Methods for the Determination of Ten per cent fines Value
Clause 7.1,Aggregates in Dry Condition

Test Results :

Ten percent Fines Value	200	(TFV)

Signature :
(and printed name) C Abbott
Materials Technologist

Date of Test : 17-Jan-07
Date of Report : 29-Jan-07

1) This report only relates to the submitted sample.
2) This report must be reproduced in full.
3) The remainder of the submitted sample will be retained for twenty eight days from the date give above, unless specific arrangements are agreed with the laboratory manager.
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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 911
Job No	Date 13-10-06 13-10-06	Ground Level (m) 6.58	Co-Ordinates () E 127,880.7 N 228,219.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				6.08		(0.50) 0.50	Grass over soft peaty TOPSOIL.		
0.50		N50/ 0 (2, 23, 50)		5.88		0.70	OBSTRUCTION - possible large boulder.		
0.70		N75/ 75 (25, 50)					Refusal - possible boulders.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
13-10-06	09.00	0.00	0.00		
13-10-06	13.00	0.70	0.70		

Chiselling			Water Added	
From	To	Hours	From	To
0.5	.7	1		

GENERAL REMARKS

Moved and set up at BH 911a.Borehole backfilled with arisings.

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA.GPJ AGS 3_1.GDT 31/01/07

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 911A
Job No	Date 16-10-06 16-10-06	Ground Level (m) 6.56	Co-Ordinates () E 127,888.4 N 228,239.9	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.50m 2nd: 3rd:	Rose to (@ 20 min.): 1.30m	Sealed at: Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B						Grass over very soft PEAT (H3,B1,F3,R2,W0,N1,TV1,TH0,A0,P0).		
0.50-1.00	B								
0.50		N0 (0, 0, 0, 0, 0, 0)				(1.50)			
			1 ▽ 1 ▼	5.06		1.50			
1.50-2.00	B						Dense grey silty very sandy GRAVEL with subrounded to subangular cobbles and possible boulders.		
1.50	W								
1.50		N39 (4, 5, 8, 10, 10, 11)							
2.50-3.00	B					(2.20)	2.50 medium dense.		
2.50		N29 (4, 7, 8, 7, 6, 8)							
3.50		N50/ 85 (12, 16, 35, 15)		2.86		3.70			
							Refusal - possible rock or boulders.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
16-10-06	09.00	0.00	0.00			1.8	2	0.5			Water strike at 1.50m: rose 200mm in 20mins.Moved and set up at BH 911aa.Borehole backfilled with arisings.
16-10-06	13.00	3.70	3.50			3.3	3.5	1			

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 911AA
Job No	Date 16-10-06 16-10-06	Ground Level (m) 6.57	Co-Ordinates () E 127,881.0 N 228,219.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B			6.07		(0.50) 0.50	Grass over soft peaty TOPSOIL.		
0.50		N50/ 10 (18, 7, 50)		5.77		0.80	OBSTRUCTION - possible large boulder.		
0.80		N75/ 75 (25, 50)					Refusal - possible boulders.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
16-10-06	09.00	0.00	0.00			0.6	.8	1			Moved and set up at BH 911b.Borehole backfilled with arisings.
16-10-06	13.00	0.80	0.80								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 911B
Job No	Date 16-10-06 16-10-06	Ground Level (m) 6.56	Co-Ordinates () E 127,888.5 N 228,239.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.50m 2nd: 3rd:	Rose to (@ 20 min.): 1.30m	Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B			6.06		(0.50) 0.50	Grass over very soft PEAT (H3,B1,F3,R2,W0,N1,TV1,TH0,A0,P0).		
0.50-1.00	B						Medium dense grey silty very gravelly SAND with subrounded to subangular cobbles and possible boulders.Sand is medium to coarse.		
0.50		N27 (2, 4, 8, 8, 5, 6)	1 ▽ 1 ▼			(1.70)	0.50 brown silty very gravelly medium and coarse sand.		
1.50-2.00	B						1.50 becoming dense.		
1.50	W								
1.50		N48 (8, 18, 16, 7, 12, 13)		4.36		2.20			
1.90		N68/ 170 (10, 7, 18, 29, 21)					Refusal - possible rock or boulders.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
16-10-06	09.00	0.00	0.00			1.1	1.3	0.5			Water strike at 1.50m; rose 200mm in 20mins.Borehole backfilled with arisings.
16-10-06	13.00	2.20	1.90			1.7	1.9	1			

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 934
Job No	Date 12-10-06 / 12-10-06	Ground Level (m) 6.31	Co-Ordinates () E 128,266.9 N 228,124.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B						Grass and reeds over very soft PEAT.		
0.50-1.00	B								
0.50		N0 (0, 0, 0, 0, 0, 0)				(2.00)			
1.50-2.00	B								
1.50-1.95	U	no recovery		4.31		2.00			
				3.81		(0.50) 2.50	Very soft white yellow grey slightly sandy calcareous organic SILT with shells.		
2.50-3.00	B						Very soft blue grey slightly sandy slightly gravelly organic SILT/CLAY.		
2.50		N1 (0, 0, 1, 0, 0, 0)							
3.50-4.00	B								
3.50-3.95	U	no recovery							
4.00	D					(3.30)			
4.50-5.00	B								
4.50		N0 (0, 0, 0, 0, 0, 0)							
5.00	D								
5.50		N50/ 255 (1, 1, 2, 8, 18, 22)		0.51		5.80			
				0.21		6.10	OBSTRUCTION - possible boulder.		
6.10		N75/ 75 (25, 50)					Refusal - possible rock or boulders.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
12-10-06	09.00	0.00	0.00		
12-10-06	13.00	6.10	6.00		

Chiselling			Water Added	
From	To	Hours	From	To
5.8	6.1	1.5		

GENERAL REMARKS

Moved and set up at BH 934a.Borehole backfilled with arisings.

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 934A
Job No	Date 12-10-06 / 12-10-06	Ground Level (m) 6.31	Co-Ordinates () E 128,267.0 N 228,125.0	
Contractor IDL	GROUNDWATER STRIKES — Water strikes: 1st: dry 2nd: 3rd: — Rose to (@ 20 min.): — Sealed at:			Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.00-0.50	B						Grass and reeds over very soft PEAT.		
0.50-1.00	B								
0.50-0.95	U	6 blows							
						(2.70)			
1.50-2.00	B								
1.50		N0 (0, 0, 0, 0, 0)							
2.50-3.00	B			3.61		2.70			
2.50-2.95	U	no recovery				(0.60)	Very soft white yellow grey slightly sandy calcareous organic SILT with shells.		
				3.01		3.30			
3.50-4.50	B						Soft grey slightly sandy slightly gravelly organic SILT/CLAY.		
3.50-4.50	P	no recovery				(1.70)			
4.50-5.00	B								
4.50	VANE	HV 18		1.31		5.00			
				0.91		(0.40) 5.40	OBSTRUCTION.		
5.40		N75/ 75 (25, 50)					Refusal - possible rock or boulders.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
12-10-06	09.00	0.00	0.00			5	5.4	1			Falling head permeability test completed at 3.20m depth.Borehole backfilled with arisings.
12-10-06	13.00	5.40	5.40								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 938
Job No	Date 05-10-06 05-10-06	Ground Level (m) 6.40	Co-Ordinates () E 128,340.8 N 228,137.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.50		N8 (7, 4, 3, 3, 1, 1)		5.30		(1.10) 1.10	Grass over possible loose cobbles and boulders.		
1.10		N75/ 75 (25, 50)					Refusal - possible rock or boulders. Boulders 'pushing' ahead of casing - unable to obtain samples.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
05-10-06	09.00	0.00	0.00			0.8	1.1	1			Borehole terminated-pushing boulder ahead of casing.Moved and set up at BH 938a.Borehole backfilled with arisings.
05-10-06	13.00	1.10	1.10								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA GPJ AGS 3_1.GDT 31/01/07

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 938a
Job No	Date 05-10-06 05-10-06	Ground Level (m) 6.38	Co-Ordinates () E 128,340.9 N 228,137.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.50		N2 (2, 2, 1, 1, 0, 0)					Grass over possible loose cobbles and boulders.		
1.50		N1 (1, 0, 0, 1, 0, 0)				(3.50)			
2.50		N1 (0, 1, 0, 0, 0, 1)							
				2.88		3.50			
3.50		N75/ 75 (25, 50)					Refusal - possible rock or boulders. Boulders 'pushing' ahead of casing - unable to obtain samples.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
05-10-06	09.00	0.00	0.00			3.1	3.5	1.5			Borehole terminated-pushing boulder ahead of casing.Moved and set up at BH 938b.Borehole backfilled with arisings.
05-10-06	13.00	3.50	3.50								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA.GPJ AGS 3_1.GDT 31/01/07

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 938b
Job No	Date 05-10-06 05-10-06	Ground Level (m) 6.40	Co-Ordinates () E 128,341.0 N 228,137.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.50		N2 (1, 2, 1, 0, 0, 1)					Grass over possible loose cobbles and boulders.		
1.50		N4 (0, 1, 0, 1, 2, 1)				(3.80)			
2.50		N7 (1, 2, 2, 1, 0, 4)							
3.50		N50/ 85 (6, 11, 37, 13)		2.60		3.80	3.50 becoming very dense.		
3.80		N75/ 75 (25, 50)					Refusal - possible rock or boulders. Boulders 'pushing' ahead of casing - unable to obtain samples.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
05-10-06	09.00	0.00	0.00			3.6	3.8	1			Borehole terminated-pushing boulder ahead of casing.Borehole backfilled with arisings.
05-10-06	13.00	3.80	3.50								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA.GPJ AGS 3_1.GDT 31/01/07

IDL
IRISH DRILLING LTD.
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Telephone: 091 841274
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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 939
Job No	Date 11-10-06 11-10-06	Ground Level (m) 6.34	Co-Ordinates () E 128,323.9 N 228,074.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	B						Grass over very soft PEAT.		
0.50-1.00	B								
0.50		N1 (1, 0, 0, 0, 1, 0)							
1.00	D					(2.30)			
1.50-2.00	B								
1.50-1.95	U	8 blows							
2.00	D			4.04		2.30			
2.50-3.00	B						Stiff grey slightly sandy slightly gravelly SILT with subrounded to subangular cobbles and possible boulders.		
2.50		N21 (4, 6, 5, 5, 5, 6)							
3.00	D								
3.50-4.00	B					(2.65)	3.50 becoming very stiff.		
3.50		N34 (5, 6, 7, 7, 9, 11)							
4.00	D								
4.50		N52/ 290 (8, 10, 10, 11, 16, 15)		1.39		4.95			
							Refusal - possible rock or boulders.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
11-10-06	09.00	0.00	0.00		
11-10-06	13.00	4.50	4.50		

Chiselling			Water Added	
From	To	Hours	From	To
4.2	4.5	1		

GENERAL REMARKS

Borehole backfilled with arisings.

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA.GPJ AGS 3_1.GDT 31/01/07

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 943
Job No	Date 10-10-06 10-10-06	Ground Level (m) 6.54	Co-Ordinates () E 128,327.0 N 228,109.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				6.04		(0.50) 0.50	Grass and reeds over very soft brown PEAT.		
							Borehole abandoned - very unsafe ground conditions (rig sinking).		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
10-10-06	09.00	0.00	0.00								Rig sinking on soft groun - Moved and set up at BH 943a.Borehole backfilled with arisings.
10-10-06	13.00	0.50	0.50								

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

AGS3 UK BH GALWAYBYPASSN6_SA.GPJ AGS 3_1.GDT 31/01/07

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BOREHOLE LOG

Project				BOREHOLE No
N6 Galway City Outer Bypass				BH 943A
Job No	Date 10-10-06 11-10-06	Ground Level (m) 6.54	Co-Ordinates () E 128,326.5 N 228,109.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 9.00m 2nd: 3rd:	Rose to (@ 20 min.): 3.20m	Sheet 1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.50	D						Grass and reeds over very soft PEAT/ORGANIC SILT.		
0.50-1.00	B								
0.50	VANE								
0.50		HV 10							
1.00	D								
1.50-2.50	B								
1.50-2.50	P	no recovery							
2.50	D								
3.00-3.50	B		1						
3.00	VANE								
3.00		HV 16							
3.50	D					(7.20)			
4.00-5.00	B								
4.00-5.00	P								
5.00	D								
5.50-6.00	B								
5.50	VANE								
5.50		HV 16							
6.00	D								
6.50-7.50	B								
6.50-7.50	P	no rcovery							
				-0.66		7.20			
							Soft grey slightly sandy slightly gravelly organic SILT.		
7.50	D								

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
10-10-06	09.00	0.00	0.00		

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Water strike at 8.00m: rose to 3.20m in 20mins.Borehole backfilled with arisings.

All dimensions in metres Scale 1:50	Client Galway County Council	Method/ Plant Used Dando 2000	Bit Design	Logged By RK

IDL AGS3 UK BH GALWAYBYPASSN6_SA.GPJ IDL TP TEMPLATE.GDT 09/02/07

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 517
Job No	Date 14-10-06 14-10-06	Ground Level (m) 41.80	Co-Ordinates () E 121,141.5 N 223,493.7	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 3 2 1 0			
1	1 1 1 1 1			
2	1 1 2 4 3			
3	6 10 8 16 11			
4	25			for 30mm.
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 518
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	41.00	E 121,154.9 N 223,495.2	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	2 2 1 2			
1	1 1 0 1 2			
2	1 2 3 8			for 20mm.
3	12 25			
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 519
Job No	Date 14-10-06 14-10-06	Ground Level (m) 42.00	Co-Ordinates () E 121,139.8 N 223,514.3	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 2 2 2 1			
	2 2 17			for 90mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 520
Job No	Date 14-10-06 14-10-06	Ground Level (m) 42.00	Co-Ordinates () E 121,152.9 N 223,515.1	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	4 5 4 3			
1	2 2 2 1 1			
2	2 1 2 2 5			
	8 14 10 25			for 10mm.
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 521
Job No	Date 14-10-06 14-10-06	Ground Level (m) 42.60	Co-Ordinates () E 121,139.1 N 223,533.0	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 3 2 2 1 / 1 2 3 5 14 / 25			for 100mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 522
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	42.30	E 121,152.3 N 223,535.0	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 3 2 2 13			
1	25			for 40mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 523
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	42.80	E 121,137.8 N 223,555.7	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 2 2 1 1 1 1 0 1 2 1 2 4 6 10 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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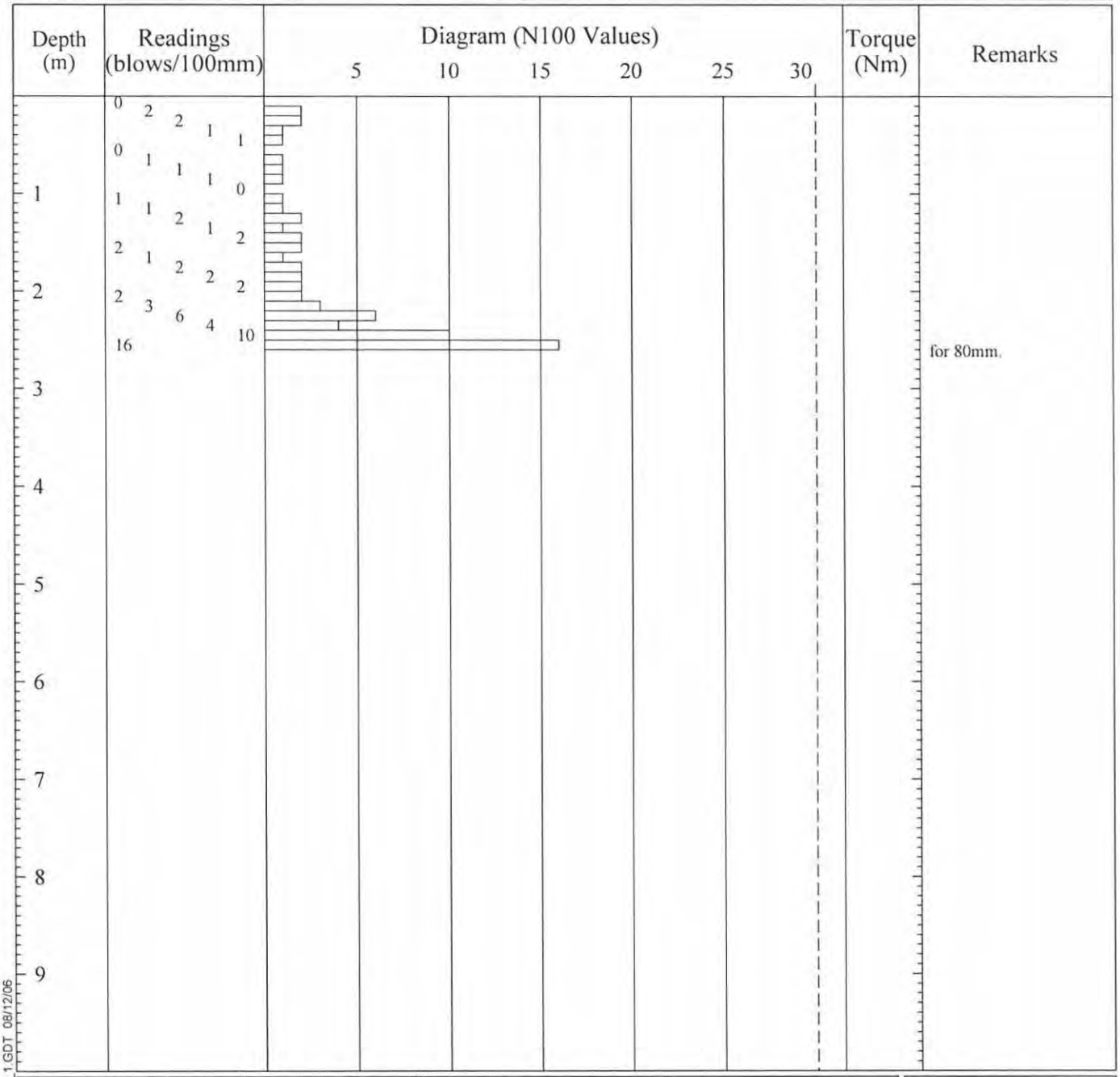
DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 524
Job No	Date 14-10-06 14-10-06	Ground Level (m) 42.60	Co-Ordinates () E 121,150.4 N 223,555.0	
Contractor IDL				Sheet 1 of 1



Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 526
Job No	Date 14-10-06 14-10-06	Ground Level (m) 43.20	Co-Ordinates () E 121,137.5 N 223,574.1	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	3 2 2 2			
1	1 2 1 1			
2	0 1 2 2 1			
3	1 2 3 6 11			for 70mm.
4	25			
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 527
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	43.50	E 121,150.8 N 223,575.4	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	5 4 2 1			
1	2 2 1 2 2			
2	2 3 4 5 2			
3	3 2 3 2 2			
4	1 2 1 1 2			
5	3 8 14			for 60mm.
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 528
Job No	Date 14-10-06 14-10-06	Ground Level (m) 43.70	Co-Ordinates () E 121,136.1 N 223,595.3	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	3 2 2 1			
1	1 1 1 2 1			
2	1 2 3 2 2			
3	4 12 25			for 30mm.
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 529
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	43.40	E 121,149.1 N 223,597.2	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	2 1 1 2			
1	2 1 2 1 3			
2	4 2 2 2 3			
3	2 6 12 25			for 60mm.
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 530
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	43.90	E 121,135.0 N 223,614.6	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 2 3 5 4 2 4 11 25			for 60mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 531
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	44.60	E 121,149.5 N 223,615.4	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 5 4 10 25			for 20mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 532
Job No	Date 14-10-06 14-10-06	Ground Level (m) 45.80	Co-Ordinates () E 121,134.3 N 223,635.8	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 3 2 1 2 / 2 1 2 9 14 / 25			for 20mm.

Hammer Wt (kg)	4.2		GENERAL REMARKS
Hammer Drop (mm)	320		Macintosh probing carried out.No access for DPH Rig.
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 533
Job No	Date 14-10-06 14-10-06	Ground Level (m) 45.40	Co-Ordinates () E 121,148.4 N 223,636.0	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 5 4 2 3			
1	10 25			for 20mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 534
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	46.00	E 121,132.7 N 223,654.6	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 2 1 2			
1	1 1 2 3 7			
	11 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

IDL
IRISH DRILLING LTD.
LOUGHREA, CO. GALWAY
Telephone: 091 841274
Fax: 091 847687

DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 535
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	46.70	E 121,147.8 N 223,656.2	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 5 4 9 25			for 80mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 536
Job No	Date 14-10-06 14-10-06	Ground Level (m) 46.20	Co-Ordinates () E 121,132.3 N 223,674.9	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	3 1 2 2			
1	1 2 1 1			
1	2 4 9 8			
10	13 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 537
Job No	Date 14-10-06 14-10-06	Ground Level (m) 46.20	Co-Ordinates () E 121,145.7 N 223,675.7	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 4 2 1 1 / 1 2 3 14 25			for 90mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 538
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	46.50	E 121,130.9 N 223,696.7	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 3 3 2 2 4 10 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 539
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	46.00	E 121,145.3 N 223,697.8	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 2 1 1 0			
1	0 1 0 1 1			
2	1 2 1 1 2			
3	1 1 2 1 2			
4	2 4 12 25			for 80mm.
5				
6				
7				
8				
9				

Hammer Wt (kg)	v
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 540
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	47.00	E 121,130.1 N 223,717.8	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 5 4 5 6 15 25			for 80mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 541
Job No	Date 14-10-06 14-10-06	Ground Level (m) 46.60	Co-Ordinates () E 121,143.3 N 223,717.7	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 3 2 2 1 / 1 2 1 1 2 / 1 2 3 10 25			for 50mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 542
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	47.20	E 121,129.7 N 223,736.2	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 2 1 0 1 2 2 3 3 8 11 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 543
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	47.20	E 121,143.8 N 223,738.2	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 3 4 3 2 5 6 17 25			for 70mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 544
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	48.70	E 121,128.0 N 223,757.3	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 2 2 1 1			
1	2 2 1 2 3			
	11 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 545
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	14-10-06 14-10-06	48.90	E 121,141.7 N 223,757.7	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 2 2 1 1			
1	2 2 1 2 4 11 25			for 30mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 547
Job No	Date 14-10-06 14-10-06	Ground Level (m) 49.30	Co-Ordinates () E 121,140.4 N 223,778.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 3 2 2 2			
1	4 11 25			for 20mm.
2				
3				
4				
5				
6				
7				
8				
9				

Hammer Wt (kg)	4.2
Hammer Drop (mm)	320
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

Macintosh probing carried out.No access for DPH Rig.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Macintosh	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1102
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	26-09-06 26-09-06	9.20	E 131,206.6 N 228,897.6	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 1 1 0			
1	1 1 0 1 1			
2	0 2 1 2 2			
3	2 1 2 3 2			
4	3 3 6 7 3			
5	3 8 7 10 11			
6	16 13 12 8 7			
7	25			for 30mm.
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1103
Job No	Date 03-10-06 03-10-06	Ground Level (m) 8.97	Co-Ordinates () E 131,217.3 N 228,897.1	
Contractor IDL				Sheet 1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	1 0 0 0			
1	0 1 0 1			
2	1 1 2 2			
3	2 3 7 5			
4	9 25 1 0			for 50mm.
5	1 0 1 0			
6	0 2 1 3			
7	3 4 6 5			
8	4 3 3 4			
9	4 4 4 3			

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1103
Job No	Date 03-10-06 03-10-06	Ground Level (m) 8.97	Co-Ordinates () E 131,217.3 N 228,897.1	
Contractor IDL				Sheet 2 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
	5 5 7 10 4 25			
11				
12				
13				
14				
15				
16				
17				
18				
19				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1105
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.40	Co-Ordinates () E 131,195.1 N 228,877.8	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 0 0 0 0			
1	0 0 0 0 0			
2	1 1 1 2 2			
3	2 1 2 2 2			
4	2 2 2 4 4			
5	5 10 9 4 3			
6	4 4 4 4 6			
7	7 7 9 9 9			
8	13 13 14 15 13			
9	14 14 12 14 10			
	25			for 40mm.

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1106
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.37	Co-Ordinates () E 131,204.5 N 228,876.4	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 0 0 0 0			
	0 0 0 0 0			
	0 0 0 0 0			
2	2 1 1 2 1			rods fell under own weight.
	1 2 2 6 4			
3	4 10 4 4 6			
	7 8 10 9 10			
4	10 13 12 25			
5				
6				
7				
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1107
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.33	Co-Ordinates () E 131,214.1 N 228,874.4	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	0 0 0 0 0			
2	0 0 0 0 0			
3	1 0 0 0 0			
4	1 3 2 2 1			
5	1 1 2 1 2			
6	2 3 7 4 4			
7	3 3 4 5 12			
8	25			for 60mm.
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1108
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.53	Co-Ordinates () E 131,195.0 N 228,857.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	0 0 1 0 0			
	0 1 1 1 2			
2	2 1 2 2 2			
	2 2 2 2 3			
3	2 2 8 5 3			
	4 4 6 4 5			
4	5 5 5 5 5			
	5 5 5 5 5			
5	7 6 7 6 6			
	6 6 6 11 7			
6	25			for 20mm.
7				
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1109
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.41	Co-Ordinates () E 131,201.4 N 228,855.9	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	1 0 1 0 1			
2	0 1 0 2 2			
3	2 1 1 3 2			
4	3 2 5 6 5			for 20mm.
5	5 7 7 5 2			
6	3 3 3 3 3			
7	7 8 25			
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1110
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	03-10-06 03-10-06	9.38	E 131,211.5 N 228,854.9	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 1			
1	0 0 0 0 0			
2	0 1 0 0 0			
3	0 1 0 1 2			
4	2 2 1 1 1			
5	1 2 3 8 7			
6	4 4 7 4 4			
7	5 5 6 6 7			
8	9 10 9 10 13			
9	8 25			for 30mm.

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1112
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.33	Co-Ordinates () E 131,188.9 N 228,836.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 1			
1	0 0 1 0 0			
2	0 1 0 1 0			
3	1 0 1 0 1			
4	1 1 2 3 3			
5	4 4 3 4 3			
6	4 4 4 5 4			
7	4 5 5 5 5			
8	5 5 5 6 6			
9	9 7 6 7 8			
	25			for 60mm.

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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LOUGHREA, CO. GALWAY
Telephone: 091 841274
Fax: 091 847687

DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1113
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.45	Co-Ordinates () E 131,198.6 N 228,835.7	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
	0 0 1 0 0			
1	0 1 1 1 1			
	1 1 1 1 2			
2	1 3 2 1 2			
	2 2 1 2 2			
3	1 5 3 2 2			
	3 3 2 2 3			
4	5 3 3 4 4			
	4 4 4 4 4			
5	4 4 4 5 6			
	6 7 6 7 6			
6	6 6 7 8 9			
	8 8 9 9 10			
7	8 9 9 10 11			
	12 11 6 25			for 20mm.
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1114
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.49	Co-Ordinates () E 131,208.6 N 228,834.0	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 1			
	0 1 0 0 0			
1	1 1 1 1 2			
	5 2 2 3 4			
2	3 3 4 4 4			
	5 10 12 6 5			
3	5 5 6 7 6			
	6 6 10 8 10			
4	25			for 80mm.
5				
6				
7				
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1115
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.67	Co-Ordinates () E 131,186.9 N 228,815.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	1 0 0 1			
1	0 0 0 1 0			
2	0 1 0 1 0			
3	0 1 1 3 2			
4	1 1 1 1 1			
5	2 3 3 2 2			
6	2 4 5 3 2			
7	2 3 6 7 3			
8	4 3 3 4 5			
9	4 4 4 4 4			
	4 4 5 5 5			
	5 6 6 8 25			for 30mm.

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1116
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.63	Co-Ordinates () E 131,195.4 N 228,814.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
0	0 1 0 1 0			
1	0 1 0 0 1			
0	0 0 0 1 0			
2	0 1 0 1 0			
1	1 1 0 1 0			
3	1 1 2 2 1			
2	1 2 2 2			
4	2 2 2 8 2			
2	3 3 3 3			
5	3 3 2 1 2			
3	2 4 3 3			
6	3 4 4 4 6			
4	8 25			for 50mm.
7				
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1117
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.50	Co-Ordinates () E 131,204.8 N 228,813.5	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	0 0 0 0 0			
2	0 0 0 0 0			
3	0 0 0 0 0			
4	0 0 0 0 0			
5	0 1 2 5 5			
6	5 6 10 8 9			
7	7 7 6 3 2			
8	1 2 2 2 2			
9	3 2 3 2 3			
	4 4 3 4 4			
	3 3 4 3 5			
	3 4 3 5 4			
	4 4 4 4 4			
	4 3 3 4 2			
	2 3 3 2 3			
	2 3 4 4 4			
	5 5 5 7 25			for 40mm.

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1119
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.83	Co-Ordinates () E 131,183.7 N 228,796.7	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 1			
1	0 0 0 1 0			
2	0 0 0 0 0			
3	0 0 0 0 2			
4	1 1 2 3 2			
5	2 2 2 2 2			
6	1 2 3 4 6			
7	5 5 12 25			for 70mm.
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1120
Job No	Date 03-10-06 03-10-06	Ground Level (m) 9.42	Co-Ordinates () E 131,192.4 N 228,795.2	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	0 1 0 0 0			
	0 0 0 1 0			
	0 1 0 1 0			
	0 1 0 1 0			
2	0 1 0 1 0			
	0 1 0 1 0			
	1 0 1 0 1			
3	1 1 1 1 1			
	1 1 1 1 1			
4	1 1 1 1 1			
	0 1 2 2 3			
5	4 3 3 9 7			
	25			for 40mm.
6				
7				
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1121
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	03-10-06 03-10-06	9.24	E 131,202.9 N 228,794.0	
Contractor				Sheet
IDL				1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	1 0 0 0			
1	0 0 0 0			
	1 0 0 0			
	0 1 0 0			
2	0 1 0 0			
	0 0 1 0			
	0 0 1 0			
3	0 1 0 0			
	1 0 0 1			
	0 0 1 0			
4	0 1 1 0			
	1 0 1 0			
5	0 1 1 1			
	0 1 0 1			
6	0 2 1 3			
	3 3 3 3			
7	3 4 6 5			
	4 4 4 4			
8	4 3 3 4			
	4 4 4 3			
9	5 4 5 4			
	4 3 4 5			

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1121
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	03-10-06 03-10-06	9.24	E 131,202.9 N 228,794.0	
Contractor				Sheet
IDL				2 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
	5 5 7 10 4 25			
11				
12				
13				
14				
15				
16				
17				
18				
19				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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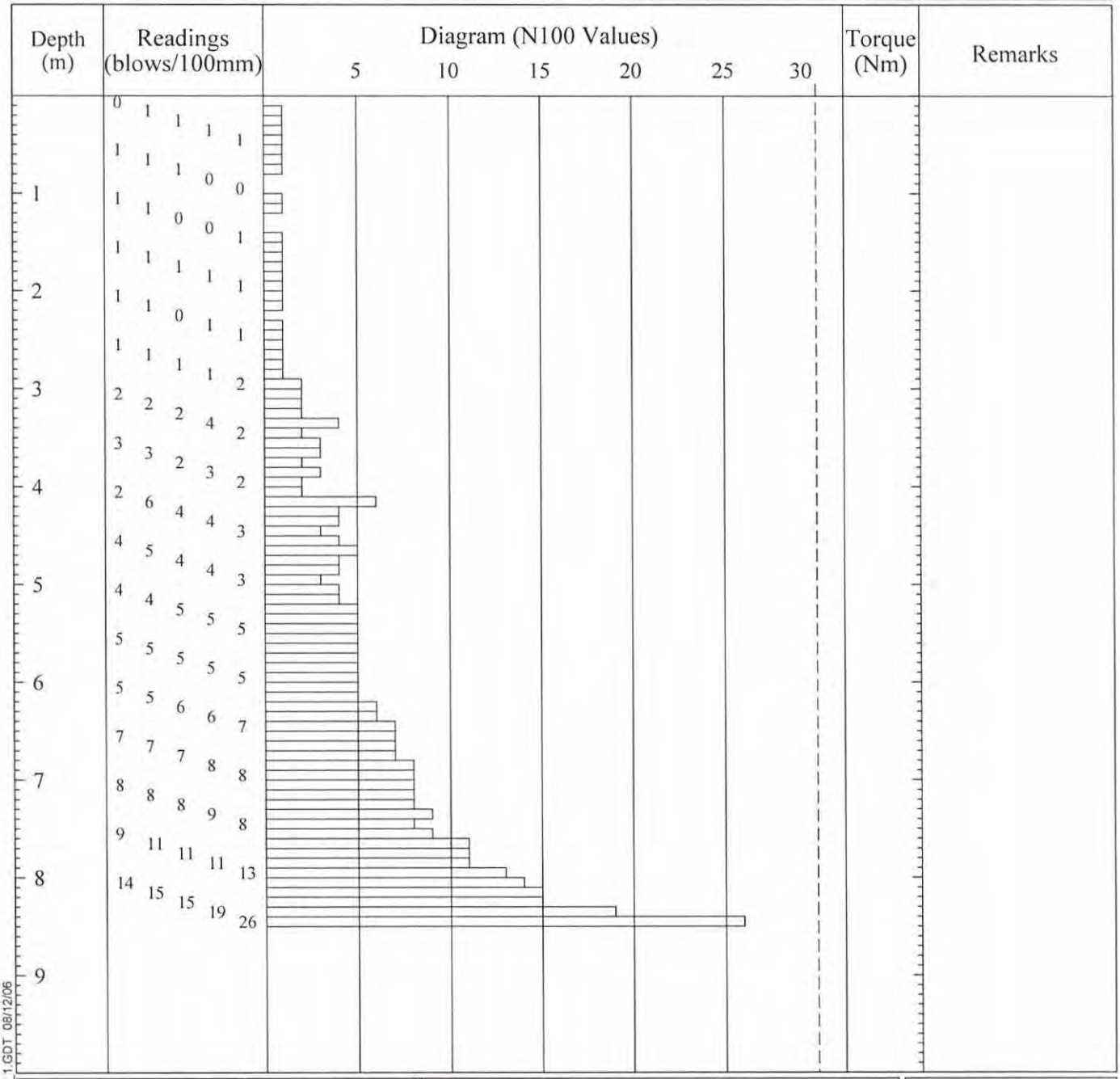
DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1123
Job No	Date 18-10-06 18-10-06	Ground Level (m) 9.80	Co-Ordinates () E 131,179.9 N 228,776.3	
Contractor IDL				Sheet 1 of 1



Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1124
Job No	Date 18-10-06 18-10-06	Ground Level (m) 9.50	Co-Ordinates () E 131,189.8 N 228,774.9	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	0 0 0 0 0			
2	0 1 0 0 0			
3	0 0 0 0 0			
4	0 1 0 1 0			
5	1 0 1 1 2			
6	3 9 12 25			for 60mm.
7				
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1124A
Job No	Date 18-10-06 18-10-06	Ground Level (m) 9.50	Co-Ordinates () E 131,190.0 N 228,775.0	
Contractor IDL				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
1	0 0 0 0 0			
2	0 1 0 0 1			
3	0 0 1 0 1			
4	0 3 6 15 7			for 30mm.
5	25			
6				
7				
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1125
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.50	E 131,199.9 N 228,773.7	
Contractor				Sheet
IDL				1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
	0 0 0 0 0			
1	0 1 0 0 0			
	0 1 0 0 1			
	0 0 0 0 0			
2	0 1 0 0 0			
	0 0 0 0 0			
3	0 1 0 0 0			
	0 1 0 0 1			
	0 0 1 0 1			
4	0 1 1 1 1			
	1 0 1 1 0			
5	1 1 1 1 1			
	1 0 1 0 1			
6	0 1 1 1 1			
	1 1 1 1 1			
7	1 1 1 1 1			
	1 2 1 2 1			
8	1 2 2 2 2			
	2 2 3 3 3			
9	3 3 4 4 3			
	4 3 3 4			

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1125
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.50	E 131,199.9 N 228,773.7	
Contractor				Sheet
IDL				2 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
11	3 4 3 4 3 4 4 3 4 3 4 5 5 6 6			
12	7 7 7 8 25			for 60mm.
13				
14				
15				
16				
17				
18				
19				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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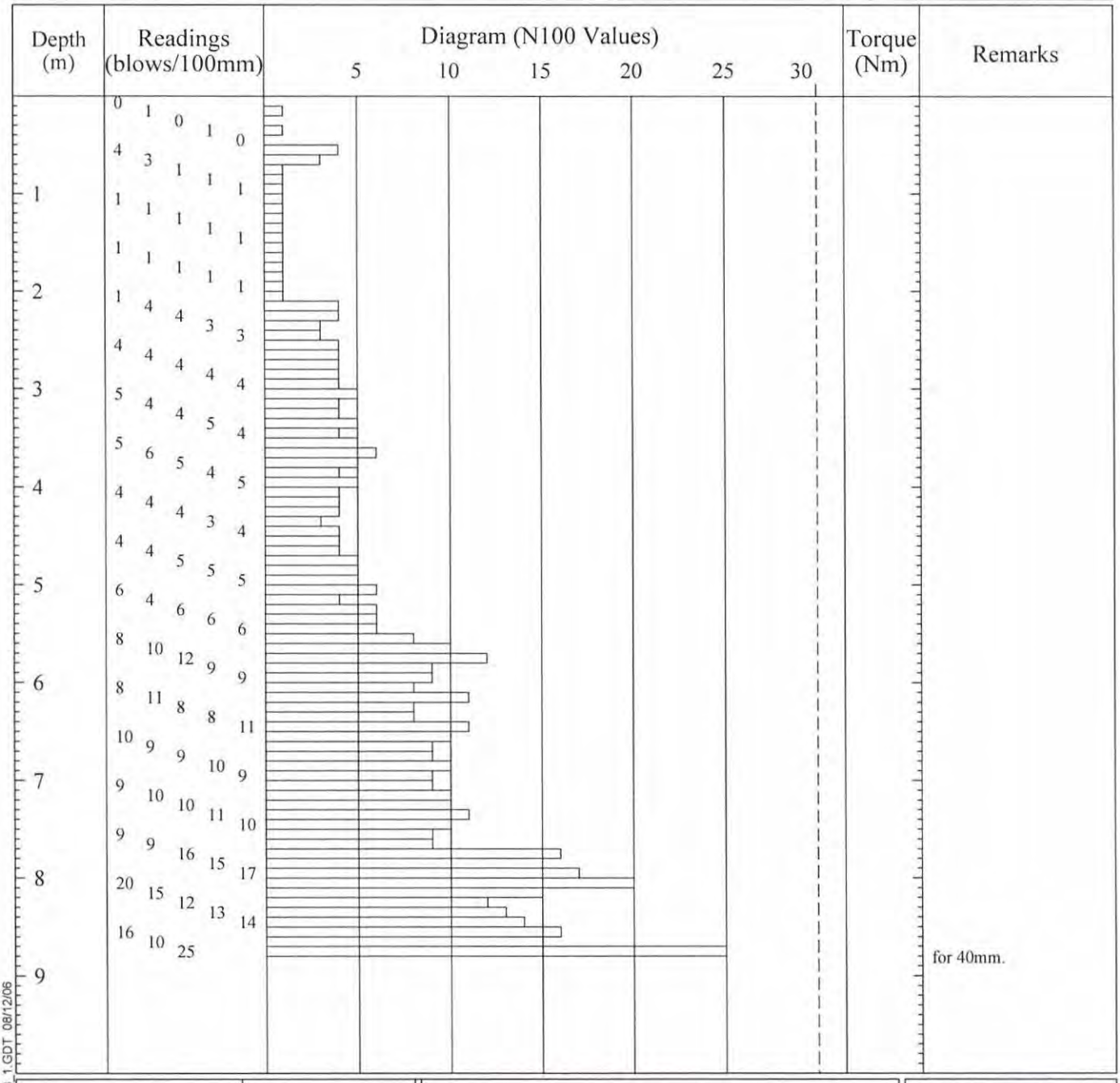
DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1126
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	10.20	E 131,177.5 N 228,756.5	
Contractor				Sheet
IDL				1 of 1



Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1127
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.40	E 131,187.5 N 228,755.3	
Contractor				Sheet
IDL				1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 0			
	0 0 0 0 0			
1	1 0 1 2 1			
	2 2 1 2 1			
2	2 1 2 2 6			
	6 3 4 4 3			
3	4 4 4 4 4			
	4 5 5 5 5			
4	7 6 7 6 7			
	6 6 6 7 7			
5	8 8 12 10 25			for 90mm.
	1 0 1 0 1			
6	0 1 1 1 1			
	1 1 1 1 1			
7	1 1 1 1 1			
	1 2 1 2 1			
8	1 2 2 2 2			
	2 2 3 3 3			
9	3 3 4 4 3			
	4 3 3 4			

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1127
Job No	Date 18-10-06 18-10-06	Ground Level (m) 9.40	Co-Ordinates () E 131,187.5 N 228,755.3	
Contractor IDL				Sheet 2 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
11	3 4 3 4 3 / 4 4 3 4 3 / 4 5 5 6 6			
12	7 7 7 8 25			for 60mm.
13				
14				
15				
16				
17				
18				
19				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1128
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.50	E 131,197.1 N 228,754.3	
Contractor				Sheet
IDL				1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 0 0 0 0			
0	1 0 0 0			
1	0 0 1 0 0			
0	0 0 0 0			
2	0 0 1 1 0			
1	0 0 0 1 0			
3	0 1 1 0 1			
1	0 1 1 2			
4	5 6 11 11 14			
15	14 15 13 9			
5	8 6 9 11 11			
7	7 7 5 6			
6	6 7 7 6 7			
7	6 7 7 8			
7	7 10 7 7			
7	7 7 7 7			
8	6 7 7 7 6			
7	7 8 7 7			
9	7 7 7 7 7			
7	11 8 10			

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1128
Job No	Date 18-10-06 18-10-06	Ground Level (m) 9.50	Co-Ordinates () E 131,197.1 N 228,754.3	
Contractor IDL				Sheet 2 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
11	8 9 10 10 9 13 13 15 15 11 20			for 80mm
12				
13				
14				
15				
16				
17				
18				
19				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1129
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	11.10	E 131,173.0 N 228,736.5	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	1 1 1 1			
1	2 1 2 1 2			
	1 1 0 1 1			
2	0 2 3 3 3			
	3 3 5 4 4			
3	4 4 4 4 4			
	5 5 9 6 7			
4	7 7 7 7 6			
	7 7 8 14 10			
5	12 12 12 12 11			
	12 13 10 10 12			
6	12 12 12 11 12			
	13 11 12 12 12			
7	12 13 15 19 25			
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1130
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.50	E 131,182.8 N 228,733.8	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
0	0 1 0 0 1			
	0 0 0 1 0			
1	0 1 1 1 1			
	1 0 1 0 1			
2	1 1 1 2 3			
	2 2 2 2 16			
3	12 3 2 3 2			
	3 5 4 4 3			
4	4 4 6 5 12			
	12 7 11 8 7			
5	6 6 6 7 8			
	7 20 12 9 12			
6	16 21 13 12 11			
	10 10 25			
7				
8				
9				

Hammer Wt (kg)	50		GENERAL REMARKS
Hammer Drop (mm)	500		
Cone Dia (mm)			
Cone Type			
Damper			

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS 3_1.GDT 08/12/06

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DYNAMIC PROBE LOG

Project				PROBE No
N6 GCOB				DP 1131
Job No	Date	Ground Level (m)	Co-Ordinates ()	
	18-10-06 18-10-06	9.30	E 131,192.6 N 228,731.5	
Contractor				Sheet
IDL				1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)	Torque (Nm)	Remarks
1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 1	5 10 15 20 25 30		rods fell under own weight.
2	0 0 0 1 0 1 2 2 5 5			
3	3 5 5 3 5 5 7 6 8 7			
4	9 8 8 7 8 8 7 9 9 9			
5	10 10 11 10 11 12 12 20 21 14			
6	14 15 15 16 16 14 15 16 18 18			
7	19 25			
8				
9				

Hammer Wt (kg)	50
Hammer Drop (mm)	500
Cone Dia (mm)	
Cone Type	
Damper	

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used DPH Rig	Logged By

AGS3 DYNAMIC PROBE N6GCOBDP.GPJ AGS3_1.GDT 08/12/06

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 01
Job No	Date 06-10-06 09-10-06	Ground Level (m) 16.14	Co-Ordinates () E 128,703.9 N 227,927.7	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00 0.50	0 (-) -	NA	15.64		(0.50) 0.50	0.00 - 0.50		Open hole drilling - no recovery.		
1.40	100 (57) 50	1 10				0.50 - 13.80 Closely spaced to 2.8m, medium spaced to 7.6m, then widely spaced, dipping 30 to 32o, undulating, locally irregular, smooth, with a little grey silt.		Very strong fresh grey thickly bedded fine to coarse grained slightly sandy LIMESTONE with some shelly debris.		
2.90	100 (98) 53	6								
4.40	100 (99) 96	3 2								
6.00	100 (94) 88	4				5.15 to 5.42m: Joint: subvertical, planar, locally irregular, stepped, rough, with a little greenish brown silt, open.				
7.60	100 (98) 83	1 3			(13.30)					
9.20	100 (96) 95	1								
	100	3								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 13.80m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 01
Job No	Date 06-10-06 09-10-06	Ground Level (m) 16.14	Co-Ordinates () E 128,703.9 N 227,927.7	
Contractor IDL				Sheet 2 of 2

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
10.80	(96) 95	1						Very strong fresh grey thickly bedded fine to coarse grained slightly sandy LIMESTONE with some shelly debris. *(continued)*	
12.20	100 (99) 98	1							
13.80	100 (99) 98	0 0	2.34		13.80			BH terminated at 13.8m bgl on RE's Instruction.	

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 13.80m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 02
Job No	Date 04-10-06 04-10-06	Ground Level (m) 13.37	Co-Ordinates () E 128,749.2 N 228,066.3	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00						0.00 - 1.80		Open hole drilling - no recovery. Drillers comment: gravel.		
	0 (-) -	NA			(1.80)					
1.80	30		11.57		1.80					
2.00	(-) -					1.80 - 3.80 Possible weathered rock?		Possible weathered LIMESTONE. Recovered as angular with occasional subangular limestone gravel and cobbles and a little light brown silt.		
	72 (-) -									
2.90		NA			(2.00)					
	50 (-) -									
3.80			9.57		3.80					
	100 (95) 54	6				3.80 - 15.20 Medium spaced to 7.6m, then widely spaced, dipping 24 to 26 degs, irregular, locally undulating, rough, with a little light brown silt. 11.70 - 11.70 with a little shelly debris. 3.81 to 4.0m: Joint: subvertical, planar, smooth, minor iron stain, open. 4.80 to 5.8m: Joint: subvertical, planar, stepped, smooth, with a little grey silt and minor iron stain, open. Non-intact. 5.80 to 6.0m: as subangular limestone gravel. 6.70 to 6.8m: as orange brown slightly sandy silt. 7.20 to 7.35m: as orange brown slightly sandy silt with some subangular limestone gravel. 7.50 to 7.65m: Joint: subvertical, undulating, rough, with greenish grey silt smear, open.		Very strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE.		
4.60										
	100 (49) 0	NI								
5.60										
	100 (12) 0									
6.00										
	100 (73) 63	4								
		1								
7.60		NI								
		4								
	100 (87) 78	1								
9.20										
		6			(11.40)					
	100					9.80 to 10.15m: Joint: subvertical,				

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 15.00m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 02
Job No	Date 04-10-06 04-10-06	Ground Level (m) 13.37	Co-Ordinates () E 128,749.2 N 228,066.3	
Contractor IDL				Sheet 2 of 2

RUN DETAILS					STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
10.80	(98) 50	3				planar, smooth, with a little brown silt and minor iron stain, open. 9.90 to 10.75m: Joint: subvertical, undulating, tight. Drilling induced - open.	Very strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE. *(continued)*	
12.30	100 (99) 98	1				11.25 to 11.7m: Joint: subvertical, undulating, tight, with brown silt smear along fracture.		
13.80	100 (99) 95	3 / 1				15.20 - 15.20 with some shelly debris.		
15.20	100 (97) 95	2	-1.83		15.20		BH terminated at 15.2m bgl on RE's Instruction.	

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 15.00m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 03
Job No	Date 05-10-06 05-10-06	Ground Level (m) 6.70	Co-Ordinates () E 128,953.6 N 227,941.5	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill	
0.00 0.50	0 (-) -	NA	6.20		(0.50) 0.50	0.00 - 0.50	Open hole drilling - no recovery.			
1.10	100 (56) 50	3				0.50 - 12.10 Medium spaced, dipping 38 to 40degs, irregular, rough, with black silt smear and greenish grey silt.	Very strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE.			
2.60	47 (0) 0	NR/NI				1.10 to 2.6m: Joint: Probable area of core loss as washout of fines during drilling. Non-intact as dark grey slightly gravelly silt.				
3.90	100 (99) 98	1 6				3.35 to 3.7m: Joint: subvertical, irregular, rough, with a grey gravelly silt smear and minor iron stain, open.planar, stepped, smooth, with a little grey silt and minor iron stain, open.				
5.00	100 (63) 25	3 NI				4.60 to 5.3m: Joint: subvertical, undulating, smooth, with a greyish brown slightly sandy gravelly silt comprising 50% of core diameter.				
6.10	100 (51) 20	3 NI				5.80 to 6.2m: Joint: subvertical, irregular, smooth, with orange brown gravelly silt with some subangular limestone gravel, open.				
8.30	100 (86) 78	5 3			(11.60)					
9.10	100 (99) 98	1				8.30 - 8.30 with some shelly debris.				
	100 (93)	2								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 12.00m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				MW 03
Job No	Date 05-10-06 05-10-06	Ground Level (m) 6.70	Co-Ordinates () E 128,953.6 N 227,941.5	
Contractor IDL				Sheet 2 of 2

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
10.70	90	1					Very strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE. *(continued)*		
12.10	100 (96) 68	8	-5.40		12.10	11.15 to 11.4m: Joint: subvertical, undulating, locally irregular, rough, with grey silt smear to 11.35, then greenish brown slightly sandy gravelly silt, wide to 11.25m, then open.	BH terminated at 12.1m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 12.00m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

IDL AGS3 UK.DH N6GCOB_ROTARY2006.GPJ IDL TP TEMPLATE.GDT 09/02/07

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 507
Job No	Date 30-11-06 30-11-06	Ground Level (m) 14.58	Co-Ordinates () E 121,271.7 N 222,595.3	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00		NI	13.98		(0.60) 0.60	0.00 - 0.60 Weathered rock.	Weathered GRANITE. Recovered as subangular biotite granite gravel and cobbles.		
1.50	80 (69) 61	1				0.60 - 8.10 Medium spaced, dipping 38 to 40deg's, planar, locally irregular, stepped, polished, smooth with dark brown iron stain, locally talcose.	Extremely strong slightly weathered granular black grey pink and white fine to medium grained BIOTITE GRANITE with pink feldspar phenocrysts up to 60mm in size.		
3.10	100 (93) 86	3							
4.70	100 (91) 90	2				3.30 to 3.55m: Joint: subvertical, undulating, stepped, smooth, with a little medium grained sand and minor iron stain, open.			
6.00	100 (99) 96	1			(7.50)	4.80 to 4.95m: Joint: subvertical, undulating, tight. 5.00 to 5.25m: Joint: subvertical, undulating, tight.			
7.60	100 (92) 76	0				6.50 to 6.6m: Joint: dipping 60deg's, undulating, tight.			
8.10	100 (99) 92	1	6.48		8.10				
							BH terminated at 8.1m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												19mm piezometer installed to 8.10m depth.Pinkish grey water flush returns observed.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 508
Job No	Date 29-11-06 29-11-06	Ground Level (m) 16.34	Co-Ordinates () E 121,278.2 N 222,682.1	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00	0		16.04		0.30	0.00 - 0.30	No recovery.		
0.30	(-)	NA							
	-					0.30 - 7.50 Medium spaced to 4.9m, then widely spaced, dipping 24 to 26deg's, undulating, locally irregular, smooth with a little brown silt smear.	Very strong slightly weathered granular dark grey groundmass with much black biotite and pink and white feldspar phenocrysts fine to medium grained BIOTITE GRANITE with pink feldspar phenocrysts up to 50mm in size.		
	100 (88) 75	1							
1.50		4				1.25 to 1.32m: Joint: dipping 52deg's, planar, locally irregular, smooth, with a brown silt smear and minor iron stain, open.			
	100 (95) 49					1.80 to 1.9m: Joint: dipping 60deg's, planar, locally irregular, smooth, with a brown silt smear and minor iron stain, open.			
2.60		6				2.05 to 2.5m: Joint: subvertical, undulating, stepped, smooth, with a little medium grained sand and minor iron stain, open.			
	100 (90) 61	9							
4.25					(7.20)	3.50 - 3.50 becoming extremely strong.			
		4							
	100 (99) 91								
6.00		1				5.70 - 5.70 subvertical pink fine grained microgranite.			
	100 (99) 99	0							
7.50		0	8.84		7.50				
							BH terminated at 7.5m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Pinkish grey water flush returns observed.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 510
Job No	Date 21-11-06 21-11-06	Ground Level (m) 23.72	Co-Ordinates () E 121,305.3 N 222,811.2	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00	72 (46) 44	NI	22.72		(1.00) 1.00	0.00 - 1.00		Probable weathered GRANITE. Recovered as subangular and angular granite gravel and cobbles.		
1.80		2				1.00 - 9.00 Widely spaced, dipping 28deg's, undulating, locally irregular, smooth.		Very strong slightly weathered granular grey white pink and black fine to medium grained BIOTITE GRANITE.		
3.30	100 (94) 81	3				2.35 to 2.41m: Joint: dipping 54deg's, planar, stepped, rough, with a little light brown sand and iron stain and smear, open				
4.70	100 (99) 98	1								
6.20	100 (99) 98	1			(8.00)					
7.80	100 (97) 83	4				6.30 - 6.30 milky white quartz vein.				
9.00	100 (99) 98	1	14.72		9.00			BH terminated at 9.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 511
Job No	Date 18-10-06 18-10-06	Ground Level (m) 28.29	Co-Ordinates () E 121,277.9 N 222,913.1	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00 0.50	0 (-) -	NA	27.79		(0.50) 0.50	0.00 - 2.30		Open hole drilling - no recovery. Drillers comment: boulders.		
1.20	57 (-) -	NA	25.99		(1.80) 2.30			Subangular occasional subrounded granite with rare limestone GRAVEL & COBBLES.		
2.50	34 (12) 8	2				2.30 - 7.20 Medium spaced to 4.7m then widely spaced, dipping 42 to 48deg's, irregular, smooth, with a little creamish brown clay. 2.80 - 2.80 extremely strong. 3.00 - 3.00 strong. 3.45 to 3.65m: 'V' shaped joint: subvertical, irregular, smooth, with cream clay smear, open. 3.65 to 4.0m: Non-intact. 4.00 - 4.00 highly weathered as subangular gravel.		Very strong slightly weathered black speckled white grey and pink fine to medium grained BIOTITE GRANITE.		
3.30	100 (99) 98	1								
		NI								
	100 (83) 66	3			(4.90)					
5.70		3								
	100 (87) 82	2								
7.20			21.09		7.20					
								BH terminated at 7.2m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												50mm standpipe installed to 7.20m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 513
Job No	Date 20-11-06 20-11-06	Ground Level (m) 33.74	Co-Ordinates () E 121,224.4 N 223,113.0	
Contractor IDL				Sheet 1 of 1

RUN DETAILS					STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend / Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00	0							
0.30	(-)	NA	33.44	0.30	0.00 - 0.30	No recovery. Drillers comment: granite.		
	-				0.30 - 5.00 Widely spaced to 1.8m, then very widely spaced.	Very strong fresh granular grey white pink and black fine to medium grained BIOTITE GRANITE.		
	100 (37) 27	0						
1.30					0.95 to 1.35m: Joint: subvertical, planar, rough, with minor iron stain, open.			
	100 (99) 98	6			1.30 - 1.30 strong moderately weathered.			
1.80								
	100 (99) 98	1		(4.70)	1.85 - 1.85 strong moderately weathered.			
3.40								
	100 (99) 98	0						
		1						
5.00			28.74	5.00				
						BH terminated at 5.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 515
Job No	Date 17-11-06 17-11-06	Ground Level (m) 39.78	Co-Ordinates () E 121,162.3 N 223,394.3	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA DESCRIPTION		Geology	Instrument/ Backfill
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	Discontinuities / Detail	Main		
0.00 / 0.60	0 (-) -	NA	39.18		(0.60) 0.60	0.00 - 0.60	Open hole drilling - no recovery. Drillers comment: granite.		
1.50	56 (0) 0	NR/NI	37.78		(1.40) 2.00	0.60 - 2.00 Core loss possibly due to residual weathering of rock with subsequent washout of fines.	Probable weathered GRANITE. Recovered as subrounded granite gravel and cobbles.		
3.00	100 (65) 55	2				2.00 - 5.00 Medium spaced, dipping 40 to 42deg's, undulating, locally irregular, smooth, with a grey clay smear.	Extremely strong slightly weathered granular pink grey green and black fine to medium grained BIOTITE GRANITE with some finely disseminated pyrite.		
4.10	100 (90) 82	NI 3			(3.00)	3.05 to 3.11m: Non-intact as greenish grey sandy gravelly clay.			
5.00	100 (96) 91	2	34.78		5.00				
							BH terminated at 5.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												50mm standpipe installed to 5.00m depth. White grey water flush returns observed.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 715
Job No	Date 29-11-06 29-11-06	Ground Level (m) 29.05	Co-Ordinates () E 124,126.3 N 224,797.1	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA DESCRIPTION		Geology	Instrument/ Backfill
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	Discontinuities Detail	Main		
0.00	47 (15) 0	NR/NI				0.00 - 0.90 Weathered rock.	Weathered GRANITE. Recovered as angular and subangular biotite granite gravel and cobbles and a little fine and medium grained quarts sand.		
1.70		NI	26.75		(2.30) 2.30	0.90 - 2.30 to 2.3m: Non-intact: as angular to subangular granite gravel and cobbles.			
3.50	100 (56) 14	9				2.30 - 6.10 Closely spaced to 5.1m, then medium spaced, dipping 40 to 42deg's, planar, locally irregular, rough, with a little greenish grey sandy clay.	Very strong slightly weathered granular pink grey white and black fine to medium grained BIOTITE GRANITE.		
		20							
5.10	100 (69) 14	12			(3.80)				
		3							
6.10	100 (99) 50	NI	22.95		6.10	5.60 to 6.1m: Joint: subvertical, undulating, locally irregular, smooth, with a very soft greenish grey talcose smear, open.Non-intact-fractured rock.	BH terminated at 6.1m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												Pinkish grey water flush returns observed.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 910
Job No	Date 22-11-06 22-11-06	Ground Level (m) 6.50	Co-Ordinates () E 127,875.0 N 228,239.7	
Contractor IDL				Sheet 1 of 2

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
0.00	0 (-) -				(1.50)	0.00 - 4.30	Open hole drilling - no recovery. Drillers comment: peat.	
1.50			5.00		1.50			
2.60	18 (-) -	NA			(2.80)		Limestone BOULDERS with a little grey slightly sandy silt.	
4.10	67 (-) -		2.20		4.30			
5.60	100 (83) 82	0				4.30 - 10.10 Widely spaced, dipping 40deg's, planar, locally irregular, smooth, with a little brown silt.	Very strong fresh grey thinly bedded fine to coarse grained slightly sandy LIMESTONE.	
		1						
7.10	100 (99) 92	2				5.93 - 5.93 strong.		
8.60	100 (93) 82	4			(5.80)	7.55 to 7.67m: Joint: dipping 72deg's, irregular, locally planar, smooth, with a brown silt smear, open.		
		0						
	100 (99) 97	1				9.06 - 9.06 strong.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	90mm standpipe installled to 4.60m depth for televiewer.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 910
Job No	Date 22-11-06 22-11-06	Ground Level (m) 6.50	Co-Ordinates () E 127,875.0 N 228,239.7	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.10			-3.60		10.10			BH terminated at 10.1m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	90mm standpipe installled to 4.60m depth for televiewer.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 912
Job No	Date 21-11-06 21-11-06	Ground Level (m) 6.59	Co-Ordinates () E 127,882.7 N 228,229.5	
Contractor IDL				Sheet 1 of 2

RUN DETAILS				STRATA					
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
0.00						0.00 - 11.20		Open hole drilling - no recovery. Drillers comment: peat and boulders.	
	13 (-) -				(3.00)				
3.00			3.59		3.00				
	33 (-) -							Subangular limestone GRAVEL & COBBLES.	
4.50									
	60 (-) -				(3.20)				
5.00		NA							
	16 (-) -								
6.20			0.39		6.20				
	8 (-) -	(17)						Light brown slightly silty uniformly graded fine to medium grained SAND.	
7.40									
	63 (-) -				(5.00)				
9.00									
	100 (-) -								

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

50mm standpipe installed to 12.30m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 912
Job No	Date 21-11-06 21-11-06	Ground Level (m) 6.59	Co-Ordinates () E 127,882.7 N 228,229.5	
Contractor IDL				Sheet 2 of 2

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
10.50		NA	-4.61		11.20	11.20 - 11.20 with some limestone cobbles.	Light brown slightly silty uniformly graded fine to medium grained SAND. *(continued)*		
11.70	83 (30) 23	8				11.20 - 19.50 Closely spaced to 12.0m, then medium spaced, dipping 20 to 22deg's, undulating, locally irregular, rough, with a little brown silt.	Very strong slightly weathered grey thinly bedded fine and medium grained slightly sandy bioclastic LIMESTONE.		
13.30	100 (95) 74	3			(2.40)	11.36 - 11.36 strong.			
		2	-7.01		13.60	12.16 - 12.16 moderately strong. 12.60 to 12.7m: Joint: dipping 60deg's, undulating, locally irregular, rough, with brown sandy silt smear, open.			
	52 (47) 41	NR	-7.71		(0.70) 14.30	12.75 to 13.2m: Joint: vertical, undulating, 2mm thick brown silt infill, tight.	CAVITY.		
15.00		1				13.60 - 13.60 strong moderately weathered. 13.60 - 14.30 CAVITY.	Very strong slightly weathered grey thinly bedded fine and medium grained slightly sandy bioclastic LIMESTONE.		
16.50	100 (99) 97	2				14.45 - 14.45 very strong moderately weathered.			
		1				15.00 - 15.00 strong.			
18.00	100 (99) 94	2			(5.20)	17.60 to 18.0m: Joint: subvertical, planar, tight, open as drilling induced.			
19.50	100 (99) 90	2				18.30 to 18.75m: Joint: subvertical, undulating, stepped, rough, with a little brown silt, open.			
		0	-12.91		19.50				
							BH terminated at 19.5m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 12.30m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933
Job No	Date 06-10-06 06-10-06	Ground Level (m) 6.42	Co-Ordinates () E 128,273.4 N 228,130.8	
Contractor IDL				Sheet 1 of 2

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00	()	NA	3.42		(3.00)	0.00 - 3.00		Open hole drilling - no recovery.		
3.00					3.00					
	10 (-) -	(5)			(3.90)	3.00 - 12.00		Grey SILT.		
6.00			-0.48		6.90					
	60 (-) -	(12)								
7.20								Grey slightly sandy gravelly SILT/CLAY with some subangular to subrounded limestone gravel and cobbles.		
	83 (-) -	NA								
8.40					(3.60)					
	42 (-) -									
9.30		(61/225)								
	58 (-)									

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls polydrill used to assist drilling.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933
Job No	Date 06-10-06 06-10-06	Ground Level (m) 6.42	Co-Ordinates () E 128,273.4 N 228,130.8	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.50	-		-4.08		10.50					
	87 (-) -	(50/150)			(1.50)			Grey subangular limestone COBBLES and BOULDERS with some dark brown silt.		
12.00			-5.58		12.00					
								Borehole terminated on R.E. instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls polydrill used to assist drilling.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 1 of 9

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail / Main	Geology	Instrument/ Backfill
0.00	0 (-) -				(3.00)	0.00 - 10.00 — Open hole drilling - no recovery. Drillers comment: peat.		
3.00			3.47		3.00			
	0 (-) -	NA			(3.00)	Open hole drilling - no recovery. Drillers comment: peat and marl.		
6.00			0.47		6.00			
7.50	40 (-) -	(50/150)			(4.40)	Greyish brown slightly sandy gravelly SILT/CLAY with subangular to subrounded limestone gravel and cobbles (TILL).		
9.00	67 (-) -	(82)						
9.70	42 (-) - 75 (-)	(48)						

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 2 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.10	-					10.00 - 20.00				
	100 (-)		-3.93		10.40					
10.60	-							Light greyish brown poorly sorted silty sandy quartz GRAVEL. Gravel is subangular to subrounded.		
	83 (-)				(2.10)					
11.80	-	(72)								
	28 (-)									
12.50	-		-6.03		12.50					
		(77)	-6.43		12.90			Dark brown organic SILT.		
	90 (-)							Limestone COBBLES & BOULDERS.		
13.60	-									
	75 (-)									
14.00	-									
	89 (-)				(3.10)					
14.90	-									
		NA								
	100 (-)									
	-		-9.53		16.00					
16.50			-10.03		(0.50) 16.50			Light greyish brown poorly sorted silty/clayey sandy quartz GRAVEL. Gravel is subangular to subrounded.		
		(44)				17.20 - 17.20 orange brown.		Brown slightly sandy SILT.		
	67 (-)									
18.00	-				(2.30)					
	100 (-)									
	-		-12.33		18.80	18.80 - 18.80 orange brown.				
19.50								Light grey moderately sorted silty quartz GRAVEL. Gravel is subangular to subrounded.		
		(46)								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 3 of 9

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
21.00	67 (-) -	NA			20.00 - 30.00			Light grey moderately sorted silty quartz GRAVEL. Gravel is subangular to subrounded. *(continued)*		
22.50	20 (-) -									
24.00	20 (-) -									
25.50	40 (-) -									
27.00	26 (-) -				(14.20)					
28.50	6 (-) -									
30.00	27 (-) -									

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 4 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
31.50	27 (-) -					30.00 - 40.00		Light grey moderately sorted silty quartz GRAVEL. Gravel is subangular to subrounded. *(continued)*		
33.00	40 (-) -		-26.53		33.00					
34.50	100 (-) -							Dark brown slightly sandy organic SILT.		
36.00	100 (-) -	NA				37.40 - 37.40 slightly gravelly.				
37.50	100 (-) -				(6.00)					
39.00	93 (-) -		-32.53		39.00					
	100 (-) -							Dark brown organic SILT.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 5 of 9

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
40.50						40.00 - 50.00		Dark brown organic SILT. *(continued)*		
42.00	100 (-) -									
43.50	100 (-) -									
45.00	93 (-) -									
46.50	100 (-) -	NA			(12.00)					
48.00	100 (-) -									
49.50	100 (-) -									

Drilling Progress and Water Observations								Rotary Flush			
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns

GENERAL REMARKS

25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 6 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
51.00	100 (-) -		-44.53		51.00	50.00 - 52.50 51.00 - 51.00 with black woody fragments.		Dark brown organic SILT. *(continued)*		
52.50	100 (-) -	NA	-46.03		(1.50) 52.50	52.50 - 52.50 becoming light brown.		Dark brown organic SILT thinly interbedded with fine grained light brown fine grained sand.		
54.00	100 (34) 0	12	-46.83		(0.80) 53.30	52.50 - 60.00		POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
		NI	-47.13		53.60			Dark brown slightly sandy organic SILT.		
55.50	93 (60) 51	10	-48.53		(1.40) 55.00			POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
57.00	100 (31) 15	NI	-49.63		(1.10) 56.10			Orange brown slightly gravelly SILT.		
58.50	87 (14) 11	15	-51.43		(1.80) 57.90	57.00 - 57.00 moderately weak highly weathered greenish grey gravel sized clasts.		POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
60.00	100 (0) 0	NI			(2.20)			Greenish grey mottled orange slightly gravelly silty SAND.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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IDL
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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 7 of 9

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
		NI	-53.63	60.10	60.00 - 70.00		POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
	100 (38) 27	3	-54.23	(0.60) 60.70					
61.50		NI	-55.03	(0.80) 61.50			Greenish grey mottled orange silty sandy GRAVEL.		
		3	-55.43	61.90			POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
	87 (41) 28	NI	-56.23	(0.80) 62.70			Orange brown silty GRAVEL.		
63.00		0					POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
	93 (60) 58	1	-57.53	(1.30) 64.00					
			-57.63	64.10			Orange brown slightly sandy SILT.		
64.50		NI	-57.73	64.20			POSSIBLE INTERBEDDED LIMESTONE ROCK? Recovered as strong slightly weathered grey fine and medium grained slightly sandy LIMESTONE.		
		0			64.20 - 64.20 limestone clasts becoming granule to small pebble grade.				
	87 (53) 38	NI	-59.13	(1.40) 65.60			Orange brown mottled grey gravelly SILT.		
66.00							Thickly interbedded orange greenish brown sandy gravelly non-calcareous SILT/CLAY with subangular limestone cobble and boulder sized clasts.		
	93 (43) 14								
67.50									
	100 (0) 0	NI							
69.00									
	100 (0) 0								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 8 of 9

RUN DETAILS						STRATA DESCRIPTION			Geology	Instrument/ Backfill
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	Discontinuities	Detail	Main		
70.50						70.00 - 78.30		Thickly interbedded orange greenish brown sandy gravelly non-calcareous SILT/CLAY with subangular limestone cobble and boulder sized clasts. *(continued)*		
72.00	63 (0) 0				(12.70)					
73.00	100 (50) 0									
75.00	63 (45) 0	NR/NI								
77.00	40 (15) 0									
78.80	33 (25) 23		-71.83		78.30	77.00 REDUCED TO NQ CORE SIZE.				
79.80	76 (63) 29	2 NR 9				78.30 - 80.00 Closely spaced to 81.0m, then medium spaced, dipping 18 to 22deg's, undulating, smooth, with a little grey silt. 78.90 to 79.2m: Possible area of core loss with subsequent washout of fines during drilling.		Strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 933A
Job No	Date 20-10-06 01-11-06	Ground Level (m) 6.47	Co-Ordinates () E 128,266.8 N 228,132.3	
Contractor IDL				Sheet 9 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
81.00	100 (88) 53	26				80.00 - 88.00 Closely spaced to 81.0m, then medium spaced, dipping 18 to 22deg's, undulating, smooth, with a little grey silt.		Strong slightly weathered grey thickly bedded fine to coarse grained LIMESTONE. *(continued)*		
82.50	100 (97) 91	3								
84.00	100 (99) 96	3								
85.50	100 (81) 50	3			(9.70)					
87.00	100 (99) 86	7								
88.00	100 (99) 82	8								
		4								
		5	-81.53		88.00					
								BH terminated at 88.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

25gls polydrill used to assist drilling.Reduced to NQ drilling from 77m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 1 of 7

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
29-09 0.00	()	NA			(3.60)	0.00 - 3.60		Open hole drilling - no recovery.		
3.60			2.61		3.60					
29-09	100 (-) -				(1.70)	3.60 - 30.20		Very strong grey fresh limestone BOULDERS.		
5.10			0.91		5.30					
29-09	33 (-) -							Grey slightly sandy gravelly SILT/CLAY with subangular limestone cobbles and boulders.		
6.00								6.00m: grey sandy very silty gravel.		
29-09	100 (-) -									
7.60										
29-09	100 (-) -	(50/150)								
9.00										
29-09	93 (-)	(47/75)								

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
29-09-06	09.00	0.00	0.00				

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 2 of 7

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail / Main	Geology	Instrument/ Backfill
10.60	-				(10.20)	Grey slightly sandy gravelly SILT/CLAY with subangular limestone cobbles and boulders. *(continued)*		
29-09 11.10	100 (-) -							
29-09 12.00	74 (-) -					12.00 - 12.00 rods filling with sand.		
29-09 13.50	100 (-) -							
29-09 15.00	60 (-) -							
29-09 16.50	43 (-) -		-9.29		15.50	Greyish white poorly sorted subangular coarse grained quartz SAND thickly interbedded with light pink brown slightly sandy SILT.		
29-09 18.00	40 (-) -	NA				grey silty gravelly sand.		
29-09 19.50	44 (-) -							
29-09								

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
29-09-06	17.00	15.00	3.00				
02-10-06	09.00	15.00	3.00				

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 3 of 7

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail / Main	Geology	Instrument/ Backfill
21.00	27 (-) -					Greyish white poorly sorted subangular coarse grained quartz SAND thickly interbedded with light pink brown slightly sandy SILT. *(continued)*		
29-09 22.50	50 (-) -				(14.20)			
29-09 24.00	62 (-) -							
29-09 25.50	57 (-) -					24.00m: grey slightly silty gravelly sand.		
29-09 27.00	47 (-) -							
29-09 28.50	53 (-) -							
29-09 30.00	40 (-) -		-23.49		29.70	Orange brown SILT.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 4 of 7

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
29-09			-23.99		30.20 (0.50)				
	87 (77) 30	3				30.20 - 33.00 Medium to 32.0m,then closely spaced,irregular,rough,grey slightly sandy silt,dipping 3-12 deg's.	Possible very strong moderately weathered limestone (Possible boulder belt) - recovered as subangular limestone COBBLES and BOULDERS with some grey slightly sandy silt.		
31.50		12			(2.80)				
29-09	100 (62) 22	28							
33.00			-26.79		33.00				
29-09	100 (-) -					33.00 - 56.70	Grey slightly silty gravelly fine to coarse grained SAND (poorly sorted).		
34.50					(3.00)		34.00m: grey very gravelly very silty sand.		
29-09	80 (-) -								
36.00			-29.79		36.00				
29-09	100 (-) -		-30.29		(0.50) 36.50		Orange brown thinly laminated SILT.		
			-30.99		(0.70) 37.20		Greyish white poorly sorted fine to coarse grained quartz SAND.		
37.50							Angular limestone COBBLES and BOULDERS.		
29-09	100 (-) -		-32.49		(1.50) 38.70				
39.00							Dark brown organic SILT with some mica.		
29-09	100 (-) -								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 5 of 7

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'ed Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
40.50								Dark brown organic SILT with some mica. *(continued)* 40.00m: grey slightly sandy silt.		
29-09 42.00	100 (-) -				(6.10)					
29-09 43.50	100 (-) -									
29-09 45.00	100 (-) -		-38.59		44.80					
		NA	-38.64		44.85			Grey slightly silty fine grained SAND.		
29-09 46.50	100 (-) -							Dark brown organic SILT with some mica. 46.00m: dark grey slightly sandy silt.		
29-09 48.00	100 (-) -				(4.05)					
29-09 49.50	100 (-) -		-42.69		48.90					
29-09	100							Grey slightly sandy gravelly SILT/CLAY with subangular limestone cobbles and boulders.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
02-10-06	17.00	42.00	3.00									Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.
03-10-06	09.00	42.00	3.00									

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 6 of 7

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
50.50	(-) -						Grey slightly sandy gravelly SILT/CLAY with subangular limestone cobbles and boulders. *(continued)*	
29-09 52.00	63 (-) -					50.80 - 50.80 50.8-52m: with black organic silt.	51.00m: dark grey slightly gravelly very sandy silt.	
29-09 53.00	50 (-) -				(7.80)			
29-09 54.00	35 (-) -							
29-09 55.50	100 (-) -					54.00 - 54.00 54-56.7m: grey mottled orange and orange brown.		
29-09 56.70	100 (-) -		-50.49		56.70		55.50m: grey silty very sandy gravel.	
29-09 58.10	100 (94) 75	8				56.70 - 69.00 Medium spaced,irregular,locally undulating,smooth,minor iron stain,some grey silt,dipping 32-36 deg's.	Very strong slightly weathered grey apparently massive fine to coarse grained LIMESTONE.	
29-09 59.00	50 (33) 21	1 NR/NI				58.30 -59.0m: probable area of core loss as residual rock or infilled cavity with subsequent washout of fines during drilling.		
29-09 60.00	100 (99) 98	2				58.30 - 58.30 58.3-58.9m: recovered as subangular limestone gravel and cobble clasts with a little orange brown slightly gravelly silt.		

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
03-10-06	17.00	51.00	3.00				
04-10-06	09.00	51.00	3.00				
04-10-06	17.00	58.10	52.00				
05-10-06	09.00	58.10	52.00				

Rotary Flush

From	To	Type	Returns

GENERAL REMARKS

Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

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N6 Galway City Outer Bypass				RC 936
Job No	Date 29-09-06 05-10-06	Ground Level (m) 6.21	Co-Ordinates () E 128,268.8 N 228,117.1	
Contractor IDL				Sheet 7 of 7

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
29-09	100 (99) 98	2						Very strong slightly weathered grey apparently massive fine to coarse grained LIMESTONE. *(continued)*		
61.50		1								
29-09	100 (95) 82	3								
63.00					(12.30)					
29-09	100 (99) 94	1								
64.50		2				64.30 -64.39m: joint; undulating,stepped,rough,minor orange stain,open,dipping 59 deg's.				
29-09	100 (99) 83	2				65.60 -65.65m: joint: irregular,smooth,some brown silt,minor orange iron stain,open.				
66.00										
29-09	100 (99) 96	2								
67.50		4				67.20 - 67.20 67.2-67.35m: strong,moderately weathered,pebbly. 67.45 -67.55m: joint; subvertical,undulating,locally irregular,smooth,orange iron stain and smear,open.				
29-09	100 (81) 54	7				68.20 -68.35m: joint: subvertical,irregular,rough,orange silt and some orange iron stain and smear,open. 68.20 - 68.20 68.2-68.6m: strong,moderately weathered,pebbly.				
69.00			-62.79		69.00			BH terminated at 69.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
05-10-06	17.00	69.00	52.00				

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Reduced to NQ drilling from 52m.13gls polydrill used to assist drilling.50mm standpipe installed to 28m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ/NQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 1 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00						0.00 - 6.00		Open hole drilling - no recovery.		
	()	NA			(6.00)					
6.00			0.26		6.00					
6.40	75 (-)	(5)				6.00 - 42.60		Grey subangular limestone COBBLES and BOULDERS.		
7.00	43 (-)									
	44 (-)				(2.50)					
8.60			-2.24		8.50					
9.00	88 (-)	(50/77)						Pinkish grey well sorted slightly silty fine grained SAND. 9.00m: grey slightly silty gravelly sand.		
	58 (-)				(1.80)					

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden. 19mm piezometer installed to 36m depth. Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 2 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.50			-4.04		10.30					
12.00	73 (-) -	(98)			(3.10)			Dark brown organic SILT thinly interbedded with brown thinly laminated slightly silty fine grained micaceous sand. 11.00m: dark grey very sandy silt.		
13.50	100 (-) -		-7.14		13.40					
15.00	40 (-) -	(21)	-8.64		(1.50) 14.90			Dark brown organic slightly sandy SILT thickly interbedded with brown slightly silty slightly sandy coarse quartz gravel.		
16.60	73 (-) -	(41)			(3.10)			Dark brown thinly interlaminated organic SILT and fine grained sand thickly interbedded with thin beds of silty sandy quartz gravel. 16.00m: dark grey slightly gravelly very sandy silt.		
18.00	64 (-) -	(71)	-11.74		18.00					
19.50	100 (-) -	(49/75)	-12.54		(0.80) 18.80			Dark brown organic SILT.		
		(66)			(1.80)			Black dry amorphous PEAT (appears coalified and with strong organic odour). 19.00m: dark grey slightly gravelly very sandy silt.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden. 19mm piezometer installed to 36m depth. Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 3 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	83 (-) -		-14.34		20.60					
21.00		(73)						Dark brown organic SILT thinly interlaminated with fine grained sand thickly interbedded with light and brownish grey fine grained SAND (apparent dip of laminations;30-32 deg's).		
22.50	100 (-) -									
24.00	100 (-) -	(77)								
25.50	100 (-) -	(84) NA			(7.50)			26.00m: dark grey slightly sandy silt.		
27.00	100 (-) -									
28.50	100 (-) -		-21.84		28.10			Dark brown organic SILT thinly interbedded with fine to medium grained SAND (apparent dip of laminations:40-42 deg's).		
30.00	100 (-) -				(2.60)	28.90 - 28.90 slightly gravelly.				

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 4 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	100 (-) -		-24.44		30.70					
31.50								Dark brown organic SILT thinly interlaminated with black organic fragments thickly interbedded with dark brown slightly silty fine grained sand.		
	100 (-) -				(3.40)			32.00m: dark grey slightly sandy silt.		
33.00										
	93 (-) -		-27.84		34.10					
34.50								Greyish white moderately sorted slightly silty quartz GRAVEL. Gravel is subrounded,fine to coarse.		
	87 (-) -		-28.84		(1.00) 35.10					
36.00								Black organic PEAT with some wood fragments thinly interbedded with dark brown silty fine grained sand,dipping 52-56 deg's.		
	100 (-) -				(2.40)	leaf and wood fragments.		36.00m: dark grey slightly gravelly slightly sandy organicsilt.		
37.50			-31.24		37.50					
	67 (-) -							Dark brown thinly laminated organic SILT widely interbedded with moderately sorted subrounded medium to coarse gravel.		
39.00					(2.70)					
	93 (-) -									

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 5 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			-33.94		40.20					
40.50								Greyish white poorly sorted subrounded quartz GRAVEL thinly interlaminated with blackwood fragments.		
	93 (-) -				(1.80)					
42.00			-35.74		42.00					
					(0.60)			Dark brown organic SILT.		
	100 (24) 18		-36.34		42.60	42.60 - 48.30 Possible weathered rock or boulders/till.Core loss possibly due to washout of fines during drilling process.		Possible limestone. Recovered as limestone boulders with some grey sandy gravelly silt/clay.Limestone is very strong,slightly weathered,grey.		
43.50										
	47 (16) 0									
45.00										
	100 (60) 47	NR/NI			(5.70)					
46.50										
	100 (61) 42									
47.70										
	93 (34) 30		-42.04		48.30	mottled orange.				
49.30						48.30 - 77.50 orange brown.		Dark brown organic SILT with some mica. 49.00m: dark grey slightly sandy silt.		
					(2.30)					

Drilling Progress and Water Observations								Rotary Flush			
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns

GENERAL REMARKS

Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 6 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	56 (-) -		-44.34		50.60			Dark brown organic SILT with some mica. *(continued)*		
52.00					(2.50)			Orange brown slightly gravelly SILT.		
	87 (-) -		-46.84		53.10		dark grey.			
53.50			-47.24		53.50			Black amorphous PEAT.		
	80 (-) -				(2.60)			Grey subangular limestone COBBLES and BOULDERS with some brown slightly sandy gravelly silt/clay.		
55.00			-49.84		56.10					
56.50	80 (-) -							Black slightly gravelly slightly silty amorphous PEAT with some black wood fragments.		
58.00	87 (-) -		-51.94		(2.10) 58.20					
	100 (-) -		-52.64		(0.70) 58.90			Orange brown SILT with some subrounded mudstone gravel (from 58.7m).		
59.50					(1.10)			Grey subangular limestone COBBLES.		
	60		-53.74		60.00					

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 7 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
60.50	(-) -		-54.24		(0.50) 60.50			Orange brown SILT with some subrounded mudstone gravel.		
	100 (-) -		-54.84		(0.60) 61.10			Grey subangular limestone BOULDER.		
62.00			-55.94		(1.10) 62.20			Dark grey SILT with some subangular cream cherty gravel.		
63.50	80 (-) -	NA						Grey brown rounded to subrounded and occasionally subangular mudstone and chert limestone GRAVEL .Moderately sorted with some brown silt and rare cobbles.		
65.00	43 (-) -				(5.30)					
66.00	55 (-) -									
67.50	10 (-) -		-61.24		67.50					
69.00	93 (-) -					reduced to NQ drilling.		Brown SILT thinly interlaminated with pale brownish grey fine sand and rare limestone cobbles.		
	73 (-) -									

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 8 of 9

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
70.50								Brown SILT thinly interlaminated with pale brownish grey fine sand and rare limestone cobbles. *(continued)*		
72.00	60 (-) -				(8.50)					
73.50	11 (-) -									
75.00	63 (-) -									
76.50	37 (-) -		-69.74		76.00					
78.00	63 (35) 31	1	-71.24		(1.50) 77.50	77.50 - 87.00 Medium (wide from 82.5m),undulating,locally irregular,rough,light brown silty sand,dipping 10-12 deg's. 78.40 -78.52m: joint: irregular,rough,open,some brown silt and mica.		Orange brown thinly laminated SILT. Very strong fresh grey thinly bedded fine to medium grained slightly sandy bioclastic micaceous LIMESTONE.		
79.50	100 (95) 83	2								
		3								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 937
Job No	Date 11-10-06 19-10-06	Ground Level (m) 6.26	Co-Ordinates () E 128,331.6 N 228,100.7	
Contractor IDL				Sheet 9 of 9

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
81.00	100 (99) 95	2						Very strong fresh grey thinly bedded fine to medium grained slightly sandy bioclastic micaceous LIMESTONE. *(continued)*		
82.50	100 (99) 95	3			(9.50)	81.45 -81.57m: joint: irregular,rough,open,some brown silt and mica.				
		3								
84.00	100 (99) 96	1								
85.50	100 (99) 98	1								
		1								
87.00	100 (99) 95	0	-80.74		87.00					
								Borehole terminated on R.E. instruction.		

Drilling Progress and Water Observations								Rotary Flush			
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns

GENERAL REMARKS

Sand blocking up drill rods. 80lts polydrill used to assist drilling and recover overburden.19mm piezometer installed to 36m depth.Reduced to NQ drilling from 67.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 940
Job No	Date 27-09-06 28-09-06	Ground Level (m) 6.20	Co-Ordinates () E 128,345.1 N 228,116.1	
Contractor IDL				Sheet 1 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00						0.00 - 6.00		Open hole drilling - no recovery.		
	()	NA			(6.00)					
		(5)								
6.00			0.20		6.00					
		(4)				6.00 - 21.70 7.00 - 7.00 driller's observation:very soft grey silt.		Grey SILT.		
	38 (-) -	(7)			(2.10)	borehole cased to 7.0m to seal silt layer.				
			-1.90		8.10					
			-2.10		8.30			Grey sandy SILT.		
9.00								Dark brown organic SILT.		
	83 (-) -	(12)								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls polydrill used to assist drilling.19mm standpipe piezometer installed to 25.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 940
Job No	Date 27-09-06 28-09-06	Ground Level (m) 6.20	Co-Ordinates () E 128,345.1 N 228,116.1	
Contractor IDL				Sheet 2 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.50					(3.70)			Dark brown organic SILT. *(continued)* dark grey brown slightly sandy silt.		
	93 (-) -	(39)								
12.00			-5.80		12.00					
	76 (-) -	(43)						Dark brown slightly sandy organic SILT.Sand is fine.		
13.50										
	100 (-) -	(49) NA								
15.00					(6.00)					
	100 (-) -	(55)								
16.50										
	77 (-) -	(57)								
18.00			-11.80		18.00					
	81 (-) -	(67)						Dark brown organic SILT thinly interbedded with thin laminations of grey fine grained sand.		
19.50					(2.20)			dark grey very silty sand.		
		(56)								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												2gls polydrill used to assist drilling.19mm standpipe piezometer installed to 25.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 940
Job No	Date 27-09-06 28-09-06	Ground Level (m) 6.20	Co-Ordinates () E 128,345.1 N 228,116.1	
Contractor IDL				Sheet 3 of 3

RUN DETAILS						STRATA DESCRIPTION				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	Discontinuities / Detail	Main	Geology	Instrument/ Backfill	
	100 (-) -		-14.00		20.20					
			-14.40		20.60		Dark brown organic SILT.			
21.00							Grey limestone GRAVEL and COBBLES with some grey sandy silt.			
		(72/79)			(1.10)	100mm of orange brown silt recovered.				
	100 (55) 49		-15.50		21.70					
		1				21.70 - 25.50 Medium spaced,undulating,locally irregular,rough,dipping 20-22 deg's. 22.05 -22.12m: joint: irregular,rough,some brown silt,open,dipping 58 deg's.	Very strong slightly weathered grey thickly bedded fine to coarse grained bioclastic LIMESTONE.			
22.50		1								
	100 (99) 97	1			(3.80)					
24.00										
	100 (99) 95	2				24.50 -24.57m: joint: undulating,smooth,grey silt smear,open,dipping 52 deg's.				
25.50		1	-19.30		25.50					
							Borehole terminated on R.E. instruction.			

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls polydrill used to assist drilling.19mm standpipe piezometer installed to 25.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 942
Job No	Date 26-09-06 27-09-06	Ground Level (m) 6.25	Co-Ordinates () E 128,366.2 N 228,119.0	
Contractor IDL				Sheet 1 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00						0.00 - 3.50		Open hole drilling - no recovery.		
	()	NA			(3.50)					
3.50			2.75		3.50					
	50 (-) -	NA			(1.20)	3.50 - 4.70		Grey subangular limestone GRAVEL and COBBLES.		
4.40			1.55		4.70					
	81 (75) 69	2				4.70 - 9.60 Medium,undulating,locally irregular,rough,some grey silt,dipping 30 deg's.		Very strong slightly weathered grey thinly bedded fine to coarse grained bioclastic LIMESTONE.		
6.00		3								
	100 (93) 70	4				6.60 -6.75m: joint: undulating,smooth,grey silt smear,open,dipping 70 deg's.				
7.50		3			(4.90)	7.25 -7.40m; joint: subvertical,undulating,rough,orange brown sandy silt smear,wide. 7.40 - 7.40 strong,slightly weathered,pebbly.				
	100 (77) 62	6				7.79 - 7.79 strong. 7.90 -8.15m: joint: subvertical,planar,smooth,greenish orange brown sandy silt infill,open.				
9.00		2	-3.35		9.60					
	86 (37) 32					9.60 - 11.40 cavity.				

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 20m depth.1gls polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 942
Job No	Date 26-09-06 27-09-06	Ground Level (m) 6.25	Co-Ordinates () E 128,366.2 N 228,119.0	
Contractor IDL				Sheet 2 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
10.50		NI/NR			(1.80)			CAVITY 9.60-10.60m: orange brown sandy silt/clay (150mm recovered). 10.60-11.30m: light brown moderately sorted silty quartz sand. 11.30-11.40m; orange brown silt. *(continued)*		
	83 (40) 37		-5.15		11.40					
12.00		1				11.40 - 20.00 Medium,undulating,locally irregular,rough,some grey silt,dipping 30 deg's.		Very strong slightly weathered grey thinly bedded fine to coarse grained bioclastic LIMESTONE.		
	100 (99) 95	3								
13.50		3								
	100 (97) 93	2				13.77 - 13.77 strong.				
15.00										
	100 (99) 95	2			(8.60)	15.50 -15.65m: joint: planar,stepped,smooth,orange silt smear,open,dipping 70 deg's.				
16.50		3								
	100 (97) 81	3				16.80 -16.85m: joint: irregular,stepped,smooth,brown silt smear,open,dipping 52 deg's. 16.90 -17.1m: joint: subvertical,irregular,stepped,smooth,brown silt smear.				
18.00						17.13 -17.2m: joint: subvertical,irregular,stepped,smooth,brown silt smear.				
	100 (96) 77	3				18.80 -19.25m: joint: vertical,undulating,locally irregular,rough,brown silt infill,open.				
19.50		3								
20.00	100 (99) 99		-13.75		20.00					

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

50mm standpipe installed to 20m depth.1gls polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 942
Job No	Date 26-09-06 27-09-06	Ground Level (m) 6.25	Co-Ordinates () E 128,366.2 N 228,119.0	
Contractor IDL				Sheet 3 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
								Borehole terminated on R.E. instruction.		

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

50mm standpipe installed to 20m depth. 1gls polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 950
Job No	Date 29-09-06 29-09-06	Ground Level (m) 17.25	Co-Ordinates () E 128,648.9 N 228,008.1	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00 0.50	0 (-) -	NA	16.75		(0.50) 0.50	0.00 - 0.50		Open hole drilling - no recovery.		
1.00	90 (-) -	NA			(0.90)	0.50 - 1.40		Angular to subrounded limestone and rare granite gravel and cobbles.		
1.40	90 (-) -		15.85		1.40	1.40 - 13.00 Medium spaced, dipping 24 to 26deg's, undulating, locally irregular, smooth, with a little brown silt.		Very strong fresh grey thickly bedded fine to coarse grained LIMESTONE.		
2.90	100 (94) 77	3 3								
4.50	100 (95) 84	4 8				3.60 to 3.7m: Joint: dipping 60deg's, planar, rough, with a grey silt smear. 4.12 - 4.12 strong.				
5.80	100 (79) 70	3				5.60 to 6.15m: Joint: subvertical, undulating, locally irregular, rough, with grey gravelly silt, wide.				
7.50	100 (98) 75	5 2			(11.60)	6.20 to 6.3m: Joint: dipping 60deg's, irregular, stepped, smooth, with a light brown silt smear, open.				
9.20	100 (98) 95	2 2								
	100	2								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Water flush returns lost at 3.50m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 950
Job No	Date 29-09-06 29-09-06	Ground Level (m) 17.25	Co-Ordinates () E 128,648.9 N 228,008.1	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.80	(96) 95	1						Very strong fresh grey thickly bedded fine to coarse grained LIMESTONE. *(continued)*		
	100 (97) 93	1								
13.00		1	4.25		13.00					
								BH terminated at 13.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Water flush returns lost at 3.50m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 952
Job No	Date 02-10-06 02-10-06	Ground Level (m) 15.19	Co-Ordinates () E 128,698.2 N 228,007.2	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA DESCRIPTION				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00	0 (-) -	NA	14.49		(0.70) 0.70	0.00 - 0.70		Open hole drilling - no recovery.		
1.20	50 (-) -	NA	13.79		(0.70) 1.40	0.70 - 1.40		Angular to subangular limestone and granite gravel and cobbles.		
3.20	90 (84) 68	4 4				1.40 - 11.00 Medium spaced to 7.3m, then widely spaced, dipping 24 to 26deg's, undulating, locally irregular, smooth, with a brown silt smear.		Strong fresh grey thickly bedded fine to coarse grained LIMESTONE.		
4.80	100 (99) 91	3 3				4.63 - 4.63 very strong.				
6.20	100 (93) 90	2								
7.70	100 (96) 91	2 2			(9.60)					
9.20	100 (99) 98	1								
	100	3								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Water flush returns lost at 4.00m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 952
Job No	Date 02-10-06 02-10-06	Ground Level (m) 15.19	Co-Ordinates () E 128,698.2 N 228,007.2	
Contractor IDL				Sheet 2 of 2

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
11.00	(98) 87	0	4.19		11.00	10.30 to 10.45m: Joint: subvertical, undulating, locally irregular, smooth, with a little light brown silt and minor iron stain, open.	Strong fresh grey thickly bedded fine to coarse grained LIMESTONE. *(continued)*		
							BH terminated at 11.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	
												Water flush returns lost at 4.00m.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 954
Job No	Date 03-10-06 03-10-06	Ground Level (m) 14.19	Co-Ordinates () E 128,796.4 N 228,022.7	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00	0 (-) -	NA	12.59		(1.60) 1.60	0.00 - 1.60		Open hole drilling - no recovery. Drillers comment: gravel.		
2.30	100 (14) 0	NA	11.99		(0.60) 2.20	1.60 - 2.20		Subangular limestone gravel.		
3.30	100 (90) 82	3				2.20 - 10.00 Widely spaced, dipping 22 to 26deg's, irregular, locally undulating, rough, with a grey silt smear. 2.89 - 2.89 very strong.		Strong fresh grey thickly bedded fine to coarse grained LIMESTONE.		
4.00	100 (99) 94	2								
5.60	100 (84) 75	4								
		2								
7.20	100 (96) 92	1			(7.80)					
		1								
8.80	100 (95) 93	2								
10.00	100 (98) 28	NI	4.19		10.00	8.80 to 9.15m: Joint: vertical, undulating, locally planar, smooth, with a brown silt smear, open. Non-intact (possible drilling induced). 9.20 to 10.0m: Joint: subvertical,				

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 8.80m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 954
Job No	Date 03-10-06 03-10-06	Ground Level (m) 14.19	Co-Ordinates () E 128,796.4 N 228,022.7	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
						planar. locally undulating, smooth, with a light brown silt smear, open. Non-intact.	BH terminated at 10.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 8.80m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 959
Job No	Date 27-10-06 27-10-06	Ground Level (m) 18.51	Co-Ordinates () E 129,166.6 N 228,074.2	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00	62 (11) 0	NR/NI	17.41		(1.10) 1.10	0.00 - 1.00		Open hole drilling - no recovery. Drillers comment: broken rock.		
1.60	100 (96) 56	6				1.00 - 15.00 Medium spaced, dipping 32 to 36deg's, undulating, locally irregular, rough, with a brown silt smear. 1.01 to 1.3m: Joint: subvertical, undulating, smooth, with a brown silt smear, wide. 1.32 to 2.9m: Joint: vertical, planar, locally irregular, stepped, rough, with orange brown silt smear and minor iron stain, open. 3.06 - 3.06 moderately strong. 3.20 to 3.65m: Joint: subvertical, planar, locally irregular, rough, with a little brown silt and minor iron stain, open. 4.16 - 4.16 strong. 4.80 to 5.2m: Non-intact as subangular limestone gravel. 5.25 to 5.5m: Joint: subvertical, undulating, locally irregular, rough, with a little light greyish brown silt and minor iron stain, open. 5.70 - 5.70 strong. 5.80 to 6.1m: Joint: subvertical, undulating, smooth, with a little brown silt, open. 6.50 to 6.6m: Joint: dipping 60deg's, undulating, smooth, with a light orange brown silt smear, open.		Very strong slightly weathered grey very thickly bedded fine to coarse grained slightly sandy LIMESTONE with some shelly debris.		
3.20	100 (99) 85	5								
4.60	100 (88) 67	4								
5.90	100 (47) 15	1								
7.40	100 (98) 84	NI 6								
9.00	100 (99) 96	3			(13.90)					
	100 (99)	2 2 1				9.00 - 9.00 thickly bedded.				

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 959
Job No	Date 27-10-06 27-10-06	Ground Level (m) 18.51	Co-Ordinates () E 129,166.6 N 228,074.2	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.60	96	2						Very strong slightly weathered grey very thickly bedded fine to coarse grained slightly sandy LIMESTONE with some shelly debris. *(continued)*		
12.20	100 (99) 96	1				10.95 to 11.15m: Joint: subvertical, planar, tight - drilling induced open?				
13.60	100 (99) 92	1								
15.00	100 (99) 98	1	3.51		15.00					
								BH terminated at 15.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 959 A
Job No	Date 21-11-06 21-11-06	Ground Level (m) 6.67	Co-Ordinates () E 129,030.8 N 228,002.9	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00	43 (-) -		5.17		(1.50) 1.50	0.00 - 5.30		Subrounded limestone GRAVEL & COBBLES.		
			4.97		1.70			Dark grey angular to subangular limestone coarse grained GRAVEL.		
2.00	25 (-) -	NA			(3.60)			Subrounded limestone GRAVEL & COBBLES.		
3.50	93 (-) -									
5.00	100 (39) 0		1.37		5.30	5.30 - 8.00 Possible weathered rock or boulders.		Weathered LIMESTONE. Recovered as very strong slightly weathered grey limestone gravel cobbles and boulders.		
6.50	100 (66) 44	NI			(2.70)					
8.00			-1.33		8.00			BH terminated at 8.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

IDL AGS3 UK DH N6GCOB_ROTARY2006.GPJ IDL TP TEMPLATE GDT 12/02/07

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 961
Job No	Date 26-10-06 26-10-06	Ground Level (m) 16.61	Co-Ordinates () E 129,198.1 N 228,090.2	
Contractor IDL				Sheet 1 of 2

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00	60 (42) 24	NA	16.01		(0.60) 0.60	0.00 - 0.60	No recovery.		
1.20		4				0.60 - 8.70 Medium spaced, dipping 26 to 30deg's, undulating, locally irregular, rough, with a brown silt smear.	Very strong slightly weathered grey thickly bedded fine and medium grained slightly sandy LIMESTONE.		
2.50	100 (99) 92	5				1.03 - 1.03 moderately strong.			
3.70	100 (93) 43	4				3.00 to 3.5m: Joint: subvertical, undulating, locally planar, smooth, with a greenish grey silt, open.			
4.70	100 (99) 71	13							
6.30	100 (96) 89	6			(8.10)				
7.70	100 (97) 87	5							
9.30	100 (79) 53	3							
		3							
		6	7.91		8.70				
		12	7.31		(0.60) 9.30	8.70 - 9.30 Closely spaced, dipping 18deg's, undulating, smooth.	Strong slightly weathered black thinly laminated pyritic LIMESTONE.		
10.00	100 (7) 0	NI	6.61		(0.70) 10.00	9.30 - 10.00 Non-intact,completely weathered rock.	Very weak completely weathered dark grey SILTSTONE with much finely disseminated pyrite.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

IDL AGS3 UK DH N6GCOB_ROTARY2006.GPJ IDL TP TEMPLATE.GDT 12/02/07

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 961
Job No	Date 26-10-06 26-10-06	Ground Level (m) 16.61	Co-Ordinates () E 129,198.1 N 228,090.2	
Contractor IDL				Sheet 2 of 2

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
								BH terminated at 10.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

IDL AGS3 UK DH N6GCOB_ROTARY2006.GPJ IDL TP TEMPLATE.GDT 12/02/07

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 968
Job No	Date 25-10-06 25-10-06	Ground Level (m) 16.30	Co-Ordinates () E 129,297.7 N 228,210.1	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00						0.00 - 5.00 Closely spaced to 1.5m, then medium spaced, dipping 24 to 26deg's, undulating, locally irregular, rough, with a brown silt smear.	Strong fresh grey thinly bedded fine grained LIMESTONE.		
	100 (95) 65	7							
1.50		5				1.50 - 1.50 moderately strong.			
	100 (74) 54	NI				1.80 to 2.0m: Joint: subvertical, undulating, smooth, with a light greyish brown silt, wide.Non-intact-fractured rock.			
2.00									
	100 (99) 71	6			(5.00)				
3.00						2.80 to 3.4m: Joint: subvertical, planar, locally irregular, smooth, with a light greenish gey silt, open.			
		9							
	100 (93) 52								
		6							
5.00			11.30		5.00				
							BH terminated at 5.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

IDL AGS3 UK DH N6GCOB_ROTARY2006.GPJ IDL TP TEMPLATE.GDT 12/02/07

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 970
Job No	Date 24-11-06 24-11-06	Ground Level (m) 16.62	Co-Ordinates () E 129,413.2 N 228,286.6	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
0.00	45 (14) 0	NA	15.22		(1.40) 1.40	0.00 - 1.40		Subangular limestone and granite COBBLES.		
2.00		9				1.40 - 9.00 Closely spaced to 5.0m, then medium spaced, dipping 20 to 24deg's, undulating, locally irregular, smooth, with a little brown silt.		Very strong slightly weathered grey thinly bedded fine and medium grained slightly sandy LIMESTONE.		
3.50	100 (47) 19	12				3.00 - 3.00 moderately weathered 'bleached' white.				
5.00	93 (73) 43	7				3.50 - 3.50 moderately strong.				
6.50	100 (84) 64	8			(7.60)					
8.00	100 (67) 56	4				6.10 to 6.4m: Joint: subvertical, planar, smooth, with a little grey silt, open.				
9.00	100 (99) 97	5	7.62		9.00					
		7						BH terminated at 9.0m bgl on RE's Instruction.		
		2								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 972
Job No	Date 20-10-06 20-10-06	Ground Level (m) 12.33	Co-Ordinates () E 129,496.4 N 228,263.0	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	DESCRIPTION: Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
0.00 0.50	0	NA	11.83		(0.50) 0.50	0.00 - 0.50		Open hole drilling - no recovery.		
1.20	100 (44) -	NI/NR			(1.40)	0.50 - 1.90 possible washout of fines during drilling process.		Grey subangular limestone GRAVEL and COBBLES (possible rock or overburden).		
2.20	70 (40) 11		10.43		1.90	1.90 - 7.40 Close(medium from 5.0m),undulating,locally irregular,rough,light greyish brown silty sand,dipping 22-24 deg's.		Very strong slightly weathered grey thickly bedded fine grained LIMESTONE.		
2.80	100 (62) 23	12								
3.80	80 (74) 59	6								
5.00	80 (24) 10	NI/NR 11			(5.50)	3.50 -3.56m; joint: irregular,rough,light brown sandy smear,open. 3.60 -4.20m: probable area of core loss-possible residual rock. 4.40 -5.00m: joint: subvertical,undulating,locally irregular,rough,light grey silt smear,open.				
5.80	100 (80) 76	7								
7.40	100 (95) 94	1 1	4.93		7.40			Borehole terminated on R.E. instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 7.40m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 973
Job No	Date 20-10-06 20-10-06	Ground Level (m) 12.60	Co-Ordinates () E 129,513.5 N 228,248.1	
Contractor IDL				Sheet 1 of 1

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00 0.50	0	NA	12.10		(0.50) 0.50	0.00 - 0.50		Open hole drilling - no recovery.		
1.30	44 (-) -	NA			(2.60)	0.50 - 3.10		Recovered as grey subangular limestone GRAVEL and COBBLES interbedded with clay bands.		
1.80	60 (-) -									
2.70	67 (-) -									
3.30	72 (31) 0		9.50		3.10					
4.50	100 (99) 83	4				3.10 - 7.10 Medium,irregular,smooth,light greyish brown silt,dipping 30-34 deg's. 3.10 -3.3m: joint: subvertical,planar,stepped,smooth,light brown silt smear,open.		Very strong slightly weathered grey thickly bedded fine grained LIMESTONE.		
5.50	100 (95) 77	4			(4.00)	4.73 -4.76m: joint: irregular,smooth,light brown silty sand,open. 4.80 -4.88m: joint: planar,rough,brown sand,open,dipping 62 deg's.				
7.10	100 (97) 90	2 2	5.50		7.10					
								Borehole terminated on R.E. instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 7.00m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used GoTract	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 977
Job No	Date 19-10-06 19-10-06	Ground Level (m) 16.34	Co-Ordinates () E 129,640.9 N 228,382.6	
Contractor IDL				Sheet 1 of 1

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
0.00	26 (-) -	NA			(2.60)	0.00 - 2.60	Subangular limestone gravel and cobbles with a little light brown silt and iron stain and smear.	
1.00								
	44 (-) -							
2.00								
	83 (-) -							
2.60			13.74		2.60			
	100 (86) 54	7 / 6				2.60 - 6.70 Closely spaced, dipping 24 to 26deg's, undulating, locally irregular, smooth, with a light orange brown silt smear. 3.40 to 3.5m: Joint: vertical, undulating, rough, with orange brown silt smear and iron stain, wide. 4.00 to 4.75m: Joint: subvertical, undulating, rough, with some orange brown silt and iron stain, open. 4.30 to 4.50m: non-intact,recovered as subangular to angular limestone gravel with some orange brown silt. 4.75 - 4.75 moderately strong moderately weathered.	Strong slightly weathered grey thickly bedded fine to coarse grained slightly sandy LIMESTONE.	
4.20								
	100 (84) 65	2 / NI / 2 / 1			(4.10)			
5.80								
	100 (93) 83	2						
6.70			9.64		6.70	6.40 to 6.55m: Joint: subvertical, planar, tight - drilling induced open?	BH terminated at 6.7m bgl on RE's Instruction.	

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	50mm standpipe installed to 6.70m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 979
Job No	Date 24-10-06 24-10-06	Ground Level (m) 24.80	Co-Ordinates () E 129,777.2 N 228,556.5	
Contractor IDL				Sheet 1 of 1

RUN DETAILS					STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
0.00 0.50	0 (-) -	NA	24.30		(0.50) 0.50	0.00 - 0.50	Open hole drilling - no recovery. Drillers comment: broken rock.	
1.40	77 (64) 23	NR/NI				0.50 - 4.20 Medium spaced, dipping 38 to 40deg's, undulating, smooth, with a brown silt smear.	Very strong slightly weathered grey thinly bedded fine and medium grained LIMESTONE.	
2.00	100 (66) 63	NI				1.40 to 1.55m: Non-intact,grey mottled orange very gravelly silt/clay. 1.55 - 1.55 grey mottled orange very gravelly silt/clay.		
2.70	85 (70) 61	2			(3.70)	2.50 to 2.7m: Probable area of core loss as washout of fines during drilling?		
3.20	100 (66) 52	NI 3				2.80 - 2.80 moderately weathered.		
4.20	100 (93) 63	6	20.60		4.20			
							BH terminated at 4.2m bgl on RE's Instruction.	

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1104
Job No	Date 29-11-06 30-11-06	Ground Level (m) 9.39	Co-Ordinates () E 131,197.5 N 228,895.3	
Contractor IDL				Sheet 1 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00						0.00 - 2.00		Open hole drilling - no recovery.		
	0 (-) -	NA			(2.00)					
2.00			7.39		2.00					
	30 (-) -					2.00 - 17.00		Grey slightly sandy gravelly SILT/CLAY with some assorted limestone cobbles and boulders.		
3.00										
	20 (-) -									
4.00										
	67 (-) -	(50/150)								
4.50										
	25 (-) -									
6.00		(NA)								
	21 (-) -									
7.50										
	21 (-) -									
9.00		(45)								
	26 (-) -				(15.00)					
10.00										

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 19.70m.2gls of polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1104
Job No	Date 29-11-06 30-11-06	Ground Level (m) 9.39	Co-Ordinates () E 131,197.5 N 228,895.3	
Contractor IDL				Sheet 2 of 3

RUN DETAILS				STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
11.50	100 (-) -	(50/150)					Grey slightly sandy gravelly SILT/CLAY with some assorted limestone cobbles and boulders. *(continued)*	
13.00	44 (-) -							
14.50	100 (-) -	NA				13.20 - 13.20 becoming orange brown slightly gravelly.		
15.50	100 (-) -							
17.00	100 (-) - 100		-7.61		17.00			
17.30	(86) 0	3				17.00 - 20.00 Medium spaced, dipping 38 to 40deg's, planar, locally irregular, rough, with orange brown silt smear. 17.60 to 18.2m: Joint: subvertical, undulating, locally irregular, rough, with greyish brown silt, open. 17.80 to 18.0m: non-intact,fractured rock. 18.75 to 18.95m: Joint: subvertical, undulating, locally irregular, rough, with greyish brown mottled orange silt, wide.	Strong slightly weathered grey thinly bedded fine and medium grained slightly sandy LIMESTONE.	
18.50	100 (77) 49	NI			(3.00)			
20.00	100 (71) 60	6 5	-10.61		20.00			

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 19.70m.2gls of polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1104
Job No	Date 29-11-06 30-11-06	Ground Level (m) 9.39	Co-Ordinates () E 131,197.5 N 228,895.3	
Contractor IDL				Sheet 3 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
								BH terminated at 20.0m bgl on RE's Instruction.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	19mm standpipe piezometer installed to 19.70m.2gls of polydrill used to assist drilling.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1118
Job No	Date 28-11-06 29-11-06	Ground Level (m) 9.72	Co-Ordinates () E 131,185.2 N 228,809.2	
Contractor IDL				Sheet 1 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
0.00	0 (-) -	NA			(3.00)	0.00 - 3.00		Open hole drilling - no recovery.		
3.00			6.72		3.00					
	8 (-) -	(2)				3.00 - 18.20		Grey slightly sandy gravelly SILT/CLAY with assorted limestone cobbles and boulders.		
5.00										
	0 (-) -	(3)								
6.50										
	39 (-) -	NA								
8.00										
	75 (-) -	(31)								
9.00										
	44 (-) -									

Drilling Progress and Water Observations							
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

2gls of polydrill used to assist drilling.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1118
Job No	Date 28-11-06 29-11-06	Ground Level (m) 9.72	Co-Ordinates () E 131,185.2 N 228,809.2	
Contractor IDL				Sheet 2 of 3

RUN DETAILS						STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
10.50								Grey slightly sandy gravelly SILT/CLAY with assorted limestone cobbles and boulders. *(continued)*		
11.30	100 (-) -				(15.20)					
12.00	64 (-) -									
13.50	100 (-) -									
15.00	100 (-) -	NA								
16.00	56 (-) -									
17.00	100 (-) -									
18.00	90 (-) -		-8.48		18.20					
19.20	100 (63) 54	2				18.30 - 22.30 Medium spaced, dipping 38 to 40deg's, planar, locally irregular, rough, with orange brown silt smear. 19.00 to 19.2m: Non-intact: as orange brown mottled orange slightly sandy silt. 19.20 - 19.20 orange brown mottled orange slightly sandy gravelly silt.		Strong fresh grey thinly bedded fine and medium grained slightly sandy LIMESTONE.		
	100 (81)	NI 10								

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls of polydrill used to assist drilling.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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DRILLHOLE LOG

Project				DRILLHOLE No
N6 Galway City Outer Bypass				RC 1118
Job No	Date 28-11-06 29-11-06	Ground Level (m) 9.72	Co-Ordinates () E 131,185.2 N 228,809.2	
Contractor IDL				Sheet 3 of 3

RUN DETAILS					STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
20.50	61	1			(4.10)	19.30 to 19.7m: Joint: subvertical, undulating, locally irregular, rough, with a little orange brown silt, open. 19.70 - 19.70 slightly weathered.	Strong fresh grey thinly bedded fine and medium grained slightly sandy LIMESTONE. *(continued)* BH terminated at 22.3m bgl on RE's Instruction.	
	100 (73) 46	NI			(2.30)	21.00 to 21.3m: Joint-upper: dipping 54deg's, irregular, rough, wide, with orange brown silt infill. 21.30 - 21.30 orange brown silt. 21.10 to 21.3m: Joint-lower: dipping 72deg's, irregular, rough, wide, with orange brown silt infill, wide.		
22.30		7	-12.58		22.30	21.55 to 21.75m: Joint: subvertical, undulating, rough, with orange brown silt, wide. 21.95 to 22.05m: Joint: dipping 60deg's, irregular, rough, with orange brown silt, wide. 22.10 to 22.16m: Non-intact: as subrounded limestone gravel with orange brown silt.		

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	2gls of polydrill used to assist drilling.Borehole backfilled with cement bentonite grout.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used County Tractor	Bit Design HQ	Logged By EAT

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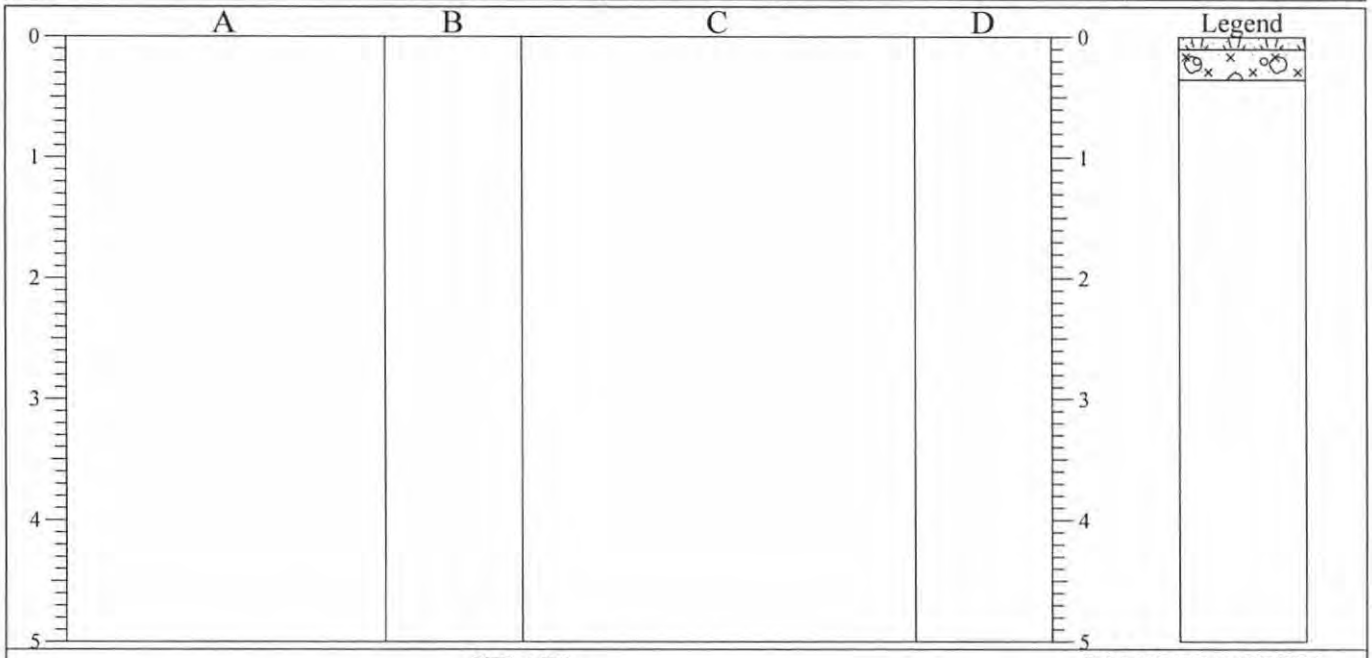
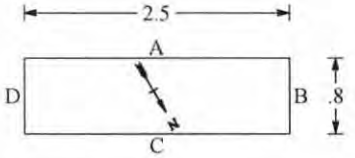
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 502
Job No	Date 29-09-06 29-09-06	Ground Level (m) 6.89	Co-Ordinates () E 121,047.4 N 222,494.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA				SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Topsoil with many roots and fibres.			0.00-0.35	J	
0.10-0.35		Soft dark brown slightly sandy gravelly SILT with many sub-angular to angular cobbles and some boulders.Boulders up to 500mm long.					
0.35		TP abandoned at 0.35m bgl on RE's instruction. Refusal - presumed rock.Dark and light grey mottled white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex60	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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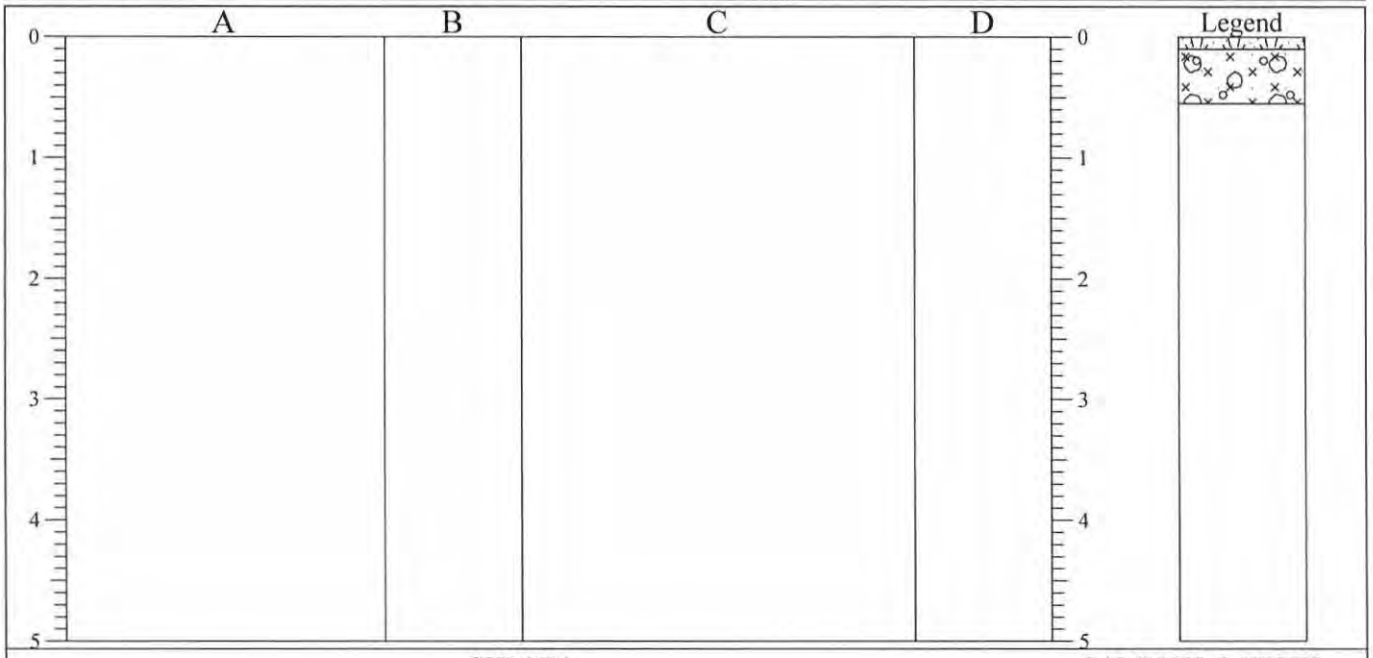
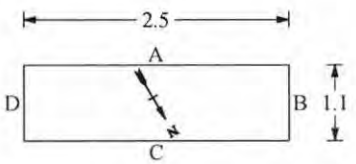
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 503
Job No	Date 29-09-06 29-09-06	Ground Level (m) 8.21	Co-Ordinates () E 121,155.2 N 222,492.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1



STRATA					SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Topsoil with many roots and fibres.			0.00-0.55	J	
0.10-0.55		Soft dark brown slightly sandy gravelly SILT with many sub-angular to angular cobbles and some boulders.Boulders up to 450mm long.					
0.55		Refusal - presumed rock. Dark and light grey mottled white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex60	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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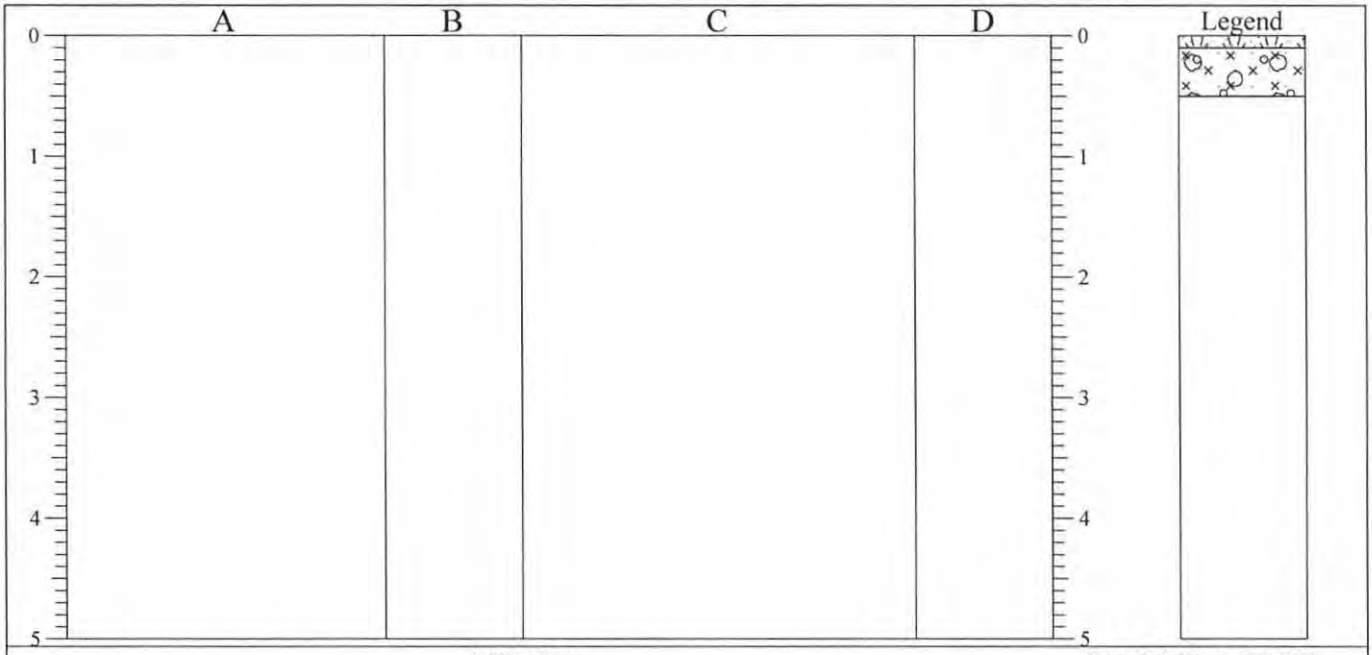
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 506
Job No	Date 29-09-06 29-09-06	Ground Level (m) 12.82	Co-Ordinates () E 121,272.7 N 222,567.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

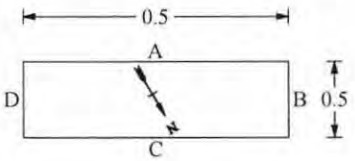


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Topsoil with many roots and fibres.			0.00-0.50	J	
0.10-0.50		Soft dark brown slightly sandy gravelly SILT with many sub-angular to angular cobbles and some boulders.Boulders up to 400mm long.					
0.50		Refusal - presumed rock. Dark and light grey mottled white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.No access for excavator-hand dug pit only.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used	Bit Design	Logged By TS

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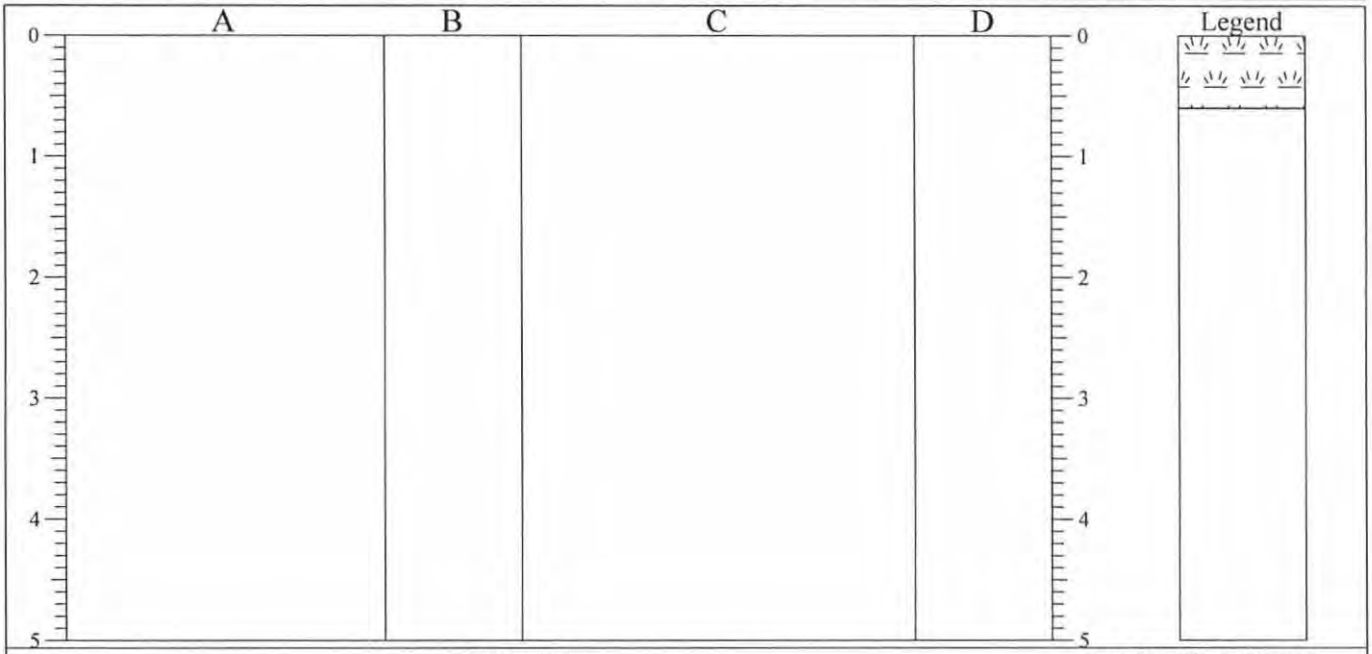
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 509
Job No	Date 29-09-06 29-09-06	Ground Level (m) 21.70	Co-Ordinates () E 121,293.9 N 222,779.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.30m Rose to (@ 20 min.): 0.14m Sealed at: 2nd: 3rd:		Sheet 1 of 1

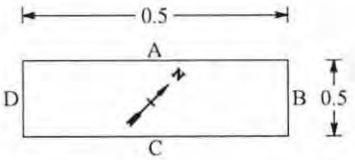


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Very soft dark brown fibrous PEAT (H5,B3,F3,R2,W0,N1,TV1,TH2,A0,P0).			0.00-0.50	J	
		0.30 - 0.30 with some subrounded to subangular cobbles and boulders.Boulders up to 300mm long.			0.30	W	
0.60		0.40 - 0.40 becoming sandy.					
		Refusal - presumed rock. Dark and light grey mottled white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation.Water strike at 0.30m-rose to 0.14m in 20mins.No access for excavator-hand dug pit only.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used	Bit Design	Logged By TS

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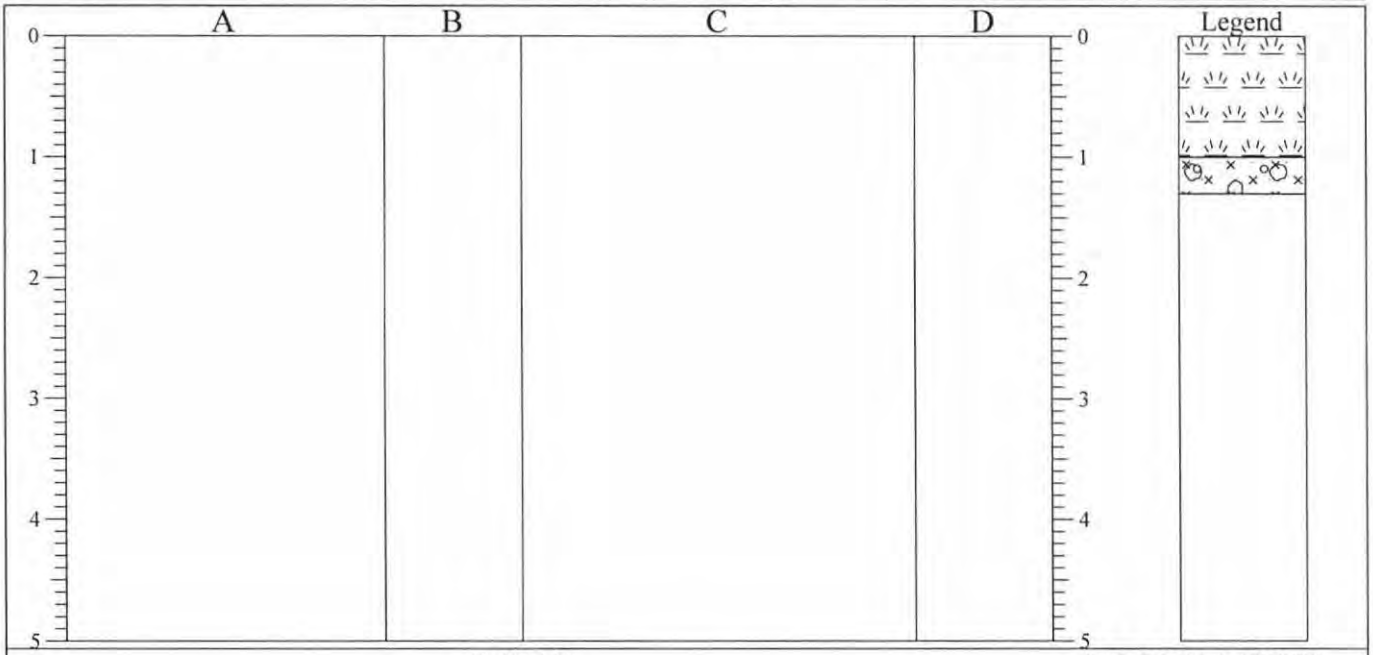
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 512
Job No	Date 29-09-06 29-09-06	Ground Level (m) 29.30	Co-Ordinates () E 121,279.8 N 223,000.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

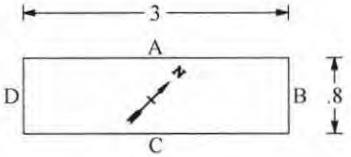


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.00		MADE GROUND - recovered as topsoil with many roots and dark brown slightly sandy gravelly silt with many angular to subangular cobbles and some boulders. Boulders up to 300mm long.			0.00-0.80	J	
					0.80-1.30	B	
1.00-1.30		MADE GROUND - recovered as brown gravelly clay with grey brown gravelly very silty sand with many rounded rounded to angular boulders (boulders flat,up to 450mm long).			0.80-1.30	J	
1.30		Refusal - presumed rock.Grey mottled brown and white granite.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex60	Bit Design	Logged By TS

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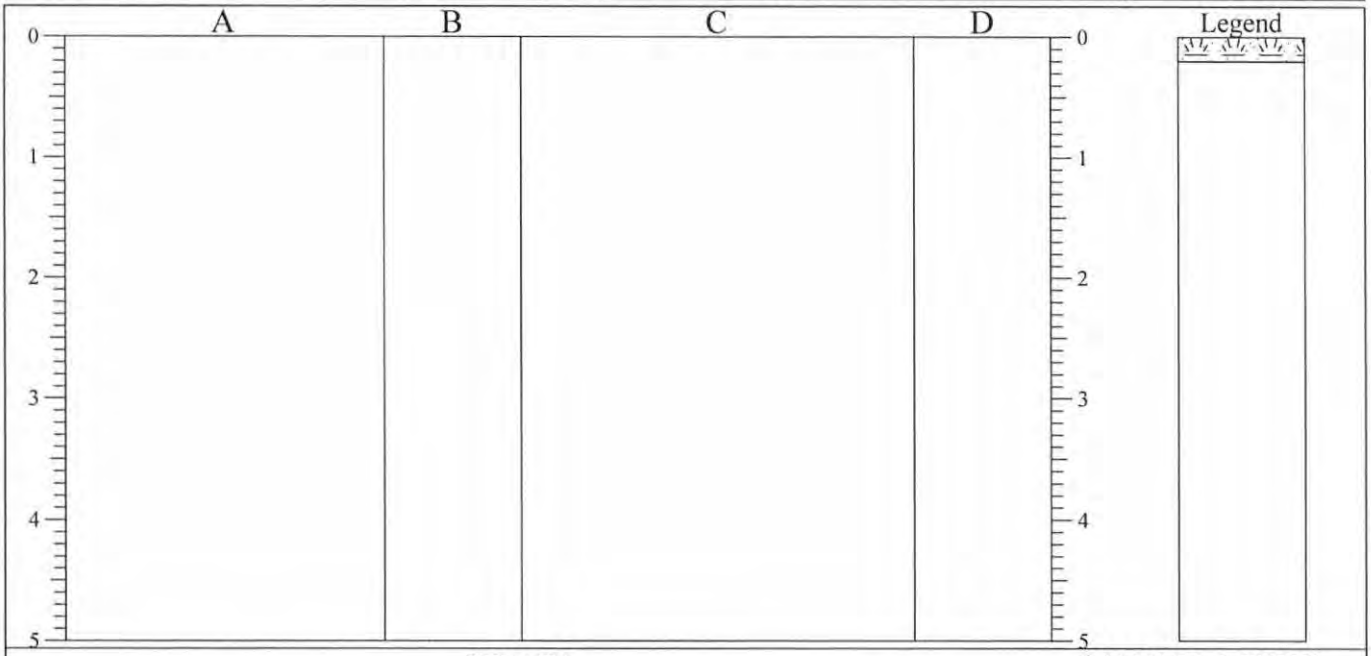
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 514
Job No	Date 29-09-06 29-09-06	Ground Level (m) 37.30	Co-Ordinates () E 121,209.1 N 223,170.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

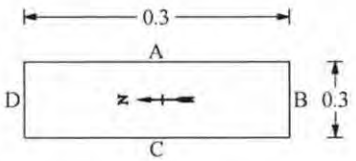


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		Soft dark brown slightly sandy SILT with many roots (TOPSOIL).			0.00-0.20	J	
0.20		Refusal - presumed rock.Grey and brown mottled white granite.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.No access for excavator-hand dug pit only.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex60	Bit Design	Logged By TS

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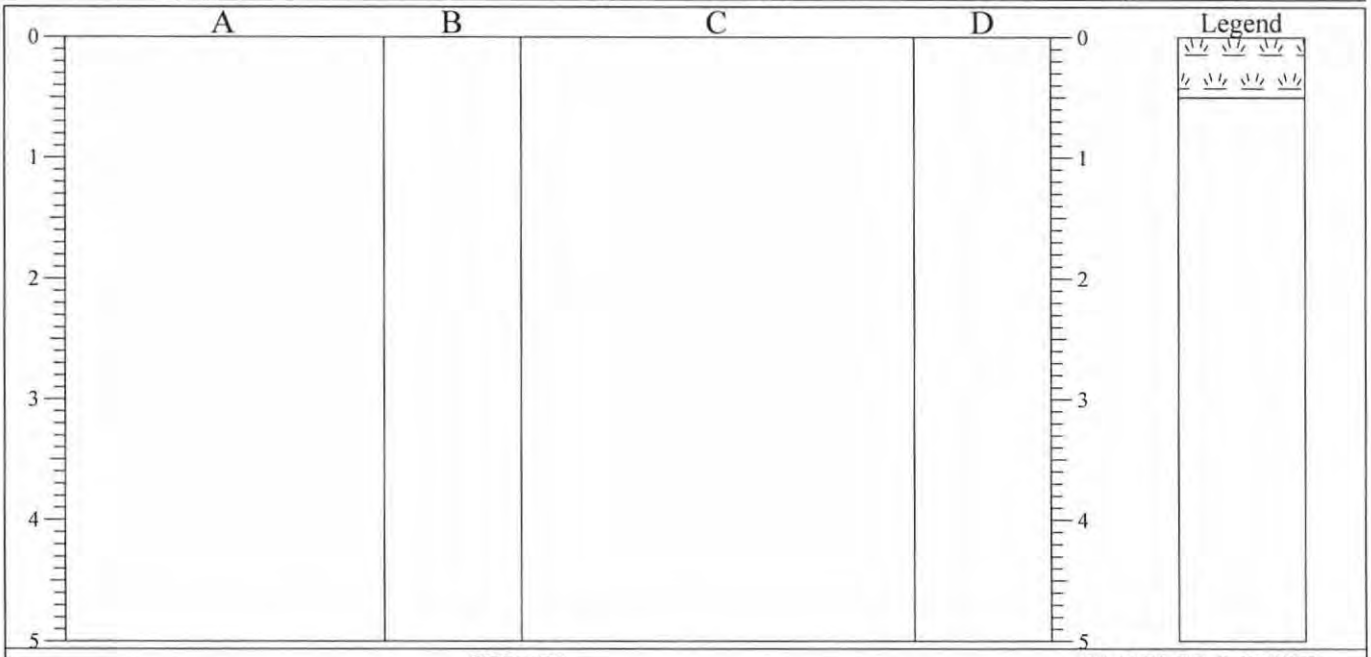
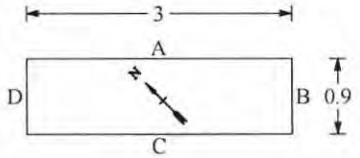
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 516
Job No	Date 28-09-06 28-09-06	Ground Level (m) 41.20	Co-Ordinates () E 121,156.7 N 223,443.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.50		Very soft dark brown fibrous PEAT (H2,B1,F2,R1,W0,N1,TV1,TH2,A0,P1).			0.00-0.50	J	
0.50		Refusal - presumed rock.Grey white brown GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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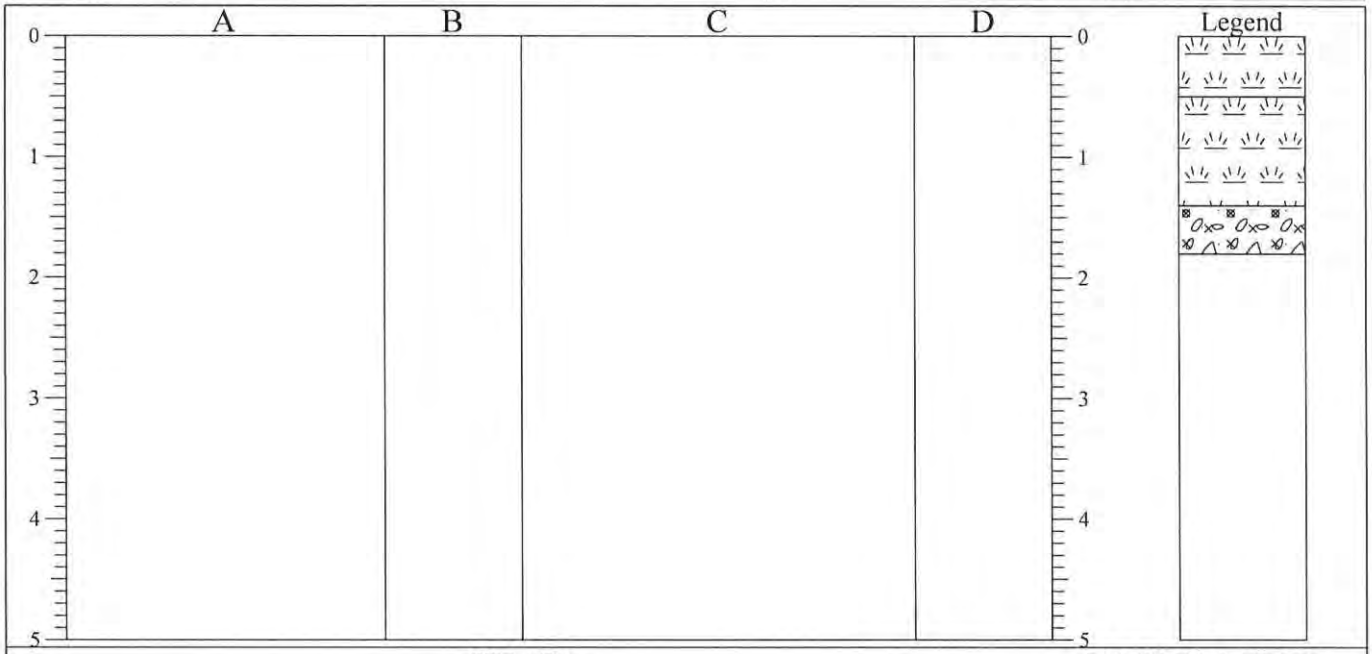
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 525
Job No	Date 28-09-06 28-09-06	Ground Level (m) 42.87	Co-Ordinates () E 121,137.2 N 223,556.8	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.18m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

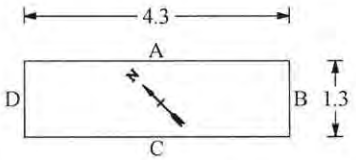


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.50		Very soft dark brown PEAT (H3,B1,P3,W0,N0,TV1,TH2,A0,P0).		▼	0.00-0.50	J	
0.50-1.40		Very soft dark brown PEAT (H1,B3,F3,W0,N1,TV0,TH0,A0,P1,R2).			0.50-1.50	B	
1.40-1.80		Grey brown silty very sandy GRAVEL with many subrounded to angular cobbles and subangular to angular boulders and traces of peat. Boulders up to 400mm long.			1.50-1.80	B	
1.80		Refusal - presumed rock.Brown grey GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation.Water strike at 0.18m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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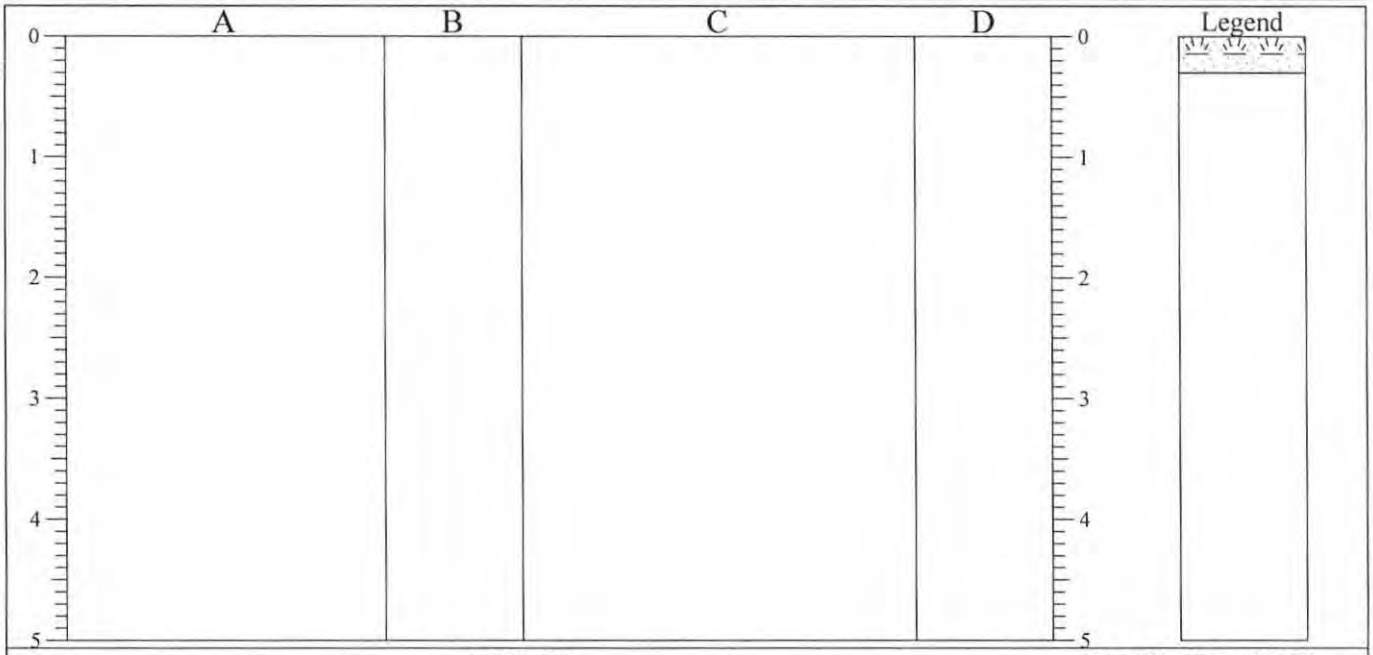
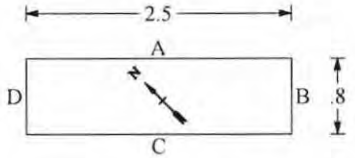
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 713
Job No	Date 06-10-06 06-10-06	Ground Level (m) 29.67	Co-Ordinates () E 124,068.9 N 225,085.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft dark brown slightly sandy gravelly SILT/CLAY with roots and many angular cobbles (TOPSOIL).			0.15-0.30	J	
0.30		Refusal - possible intact rock.Pink orange brown mottled grey white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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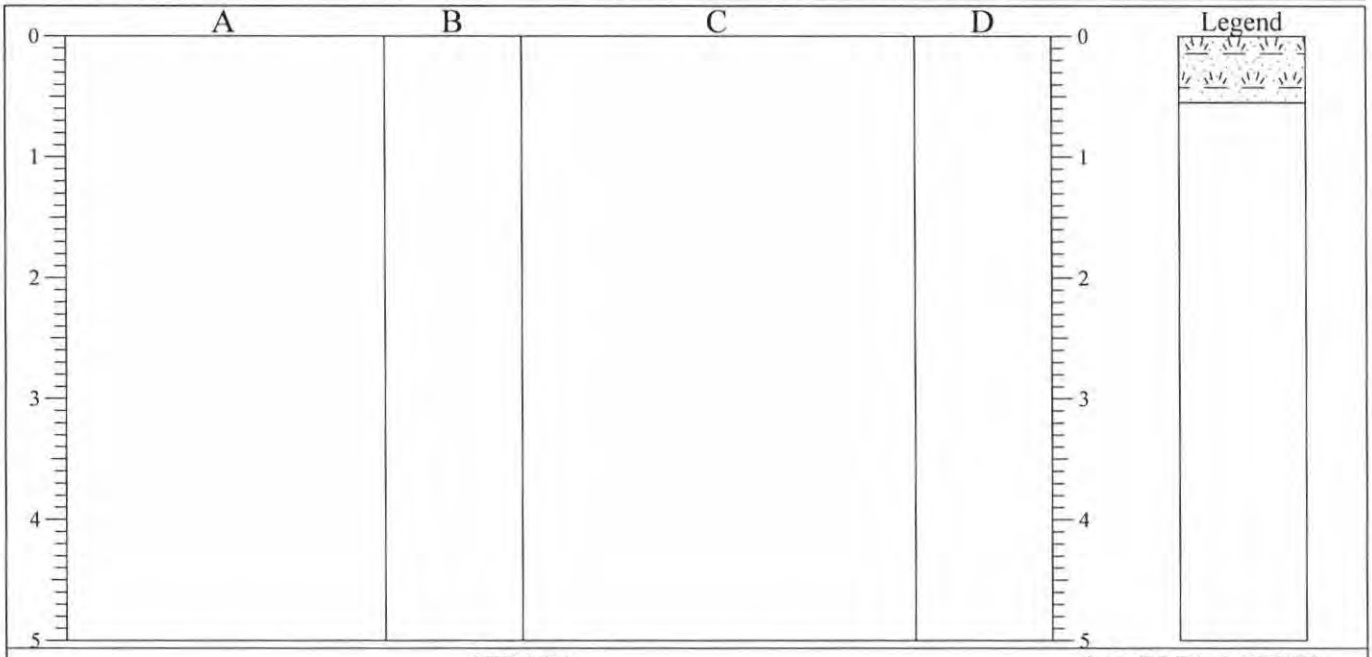
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 714
Job No	Date 06-10-06 06-10-06	Ground Level (m) 30.04	Co-Ordinates () E 124,117.2 N 224,894.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

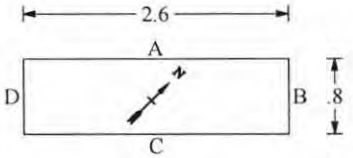


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.55		Soft dark brown slightly sandy gravelly SILT/CLAY with roots and many angular cobbles and some boulders(TOPSOIL).Boulders up to 400mm long.			0.20	J	
0.55		Refusal - possible fractured rock.Pink mottled grey white GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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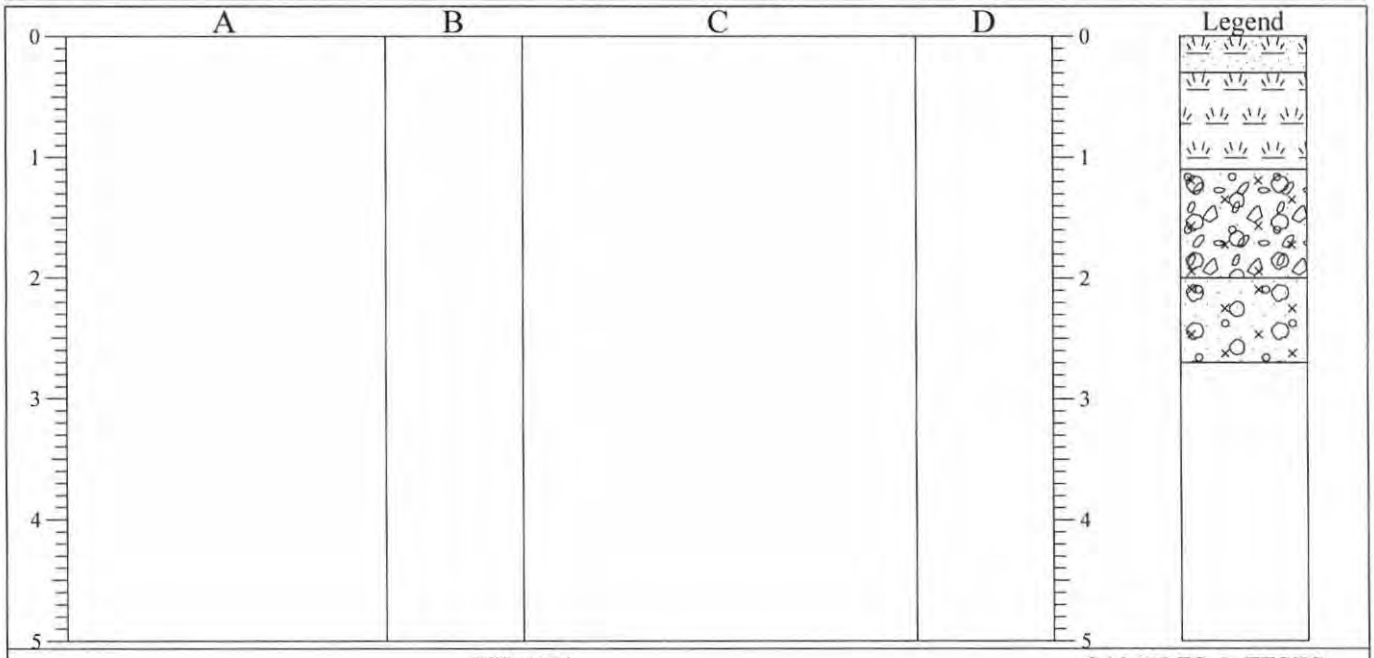
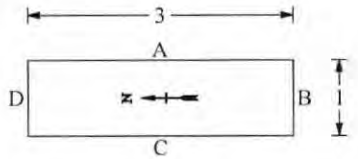
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 716
Job No	Date 09-10-06 09-10-06	Ground Level (m) 19.52	Co-Ordinates () E 124,267.4 N 224,679.9	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.30m 2nd: 1.90m 3rd:	Rose to (@ 20 min.):	Sheet 1 of 1



Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
		STRATA					**SAMPLES & TESTS**
0.00-0.30		Firm damp dark brown slightly sandy gravelly SILT/CLAY with roots(TOPSOIL).		1	0.20	J	
0.30-1.10		Very soft dark brown sandy PEAT with some subangular to subrounded cobbles (H5,B2,P1,W0,N0,TV1,TH1,A0,F3,R2).			0.70	B	
					0.70	J	
1.10-2.00		Grey brown mottled orange slightly silty very sandy GRAVEL with many subrounded to subangular cobbles and boulders.Boulders up to 350mm long.		2	1.60	B	
					1.60	J	
2.00-2.70		Grey mottled orange brown gravelly silty SAND with many angular to subangular cobbles and boulders.Boulders up to 350mm long.			2.50	B	
2.70		Refusal - possible rock or boulders.Orange brown mottled grey GRANITE.			2.50	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides from 0.60m.Water strike at 0.30m and 1.90m.Flooding present due to recent rains.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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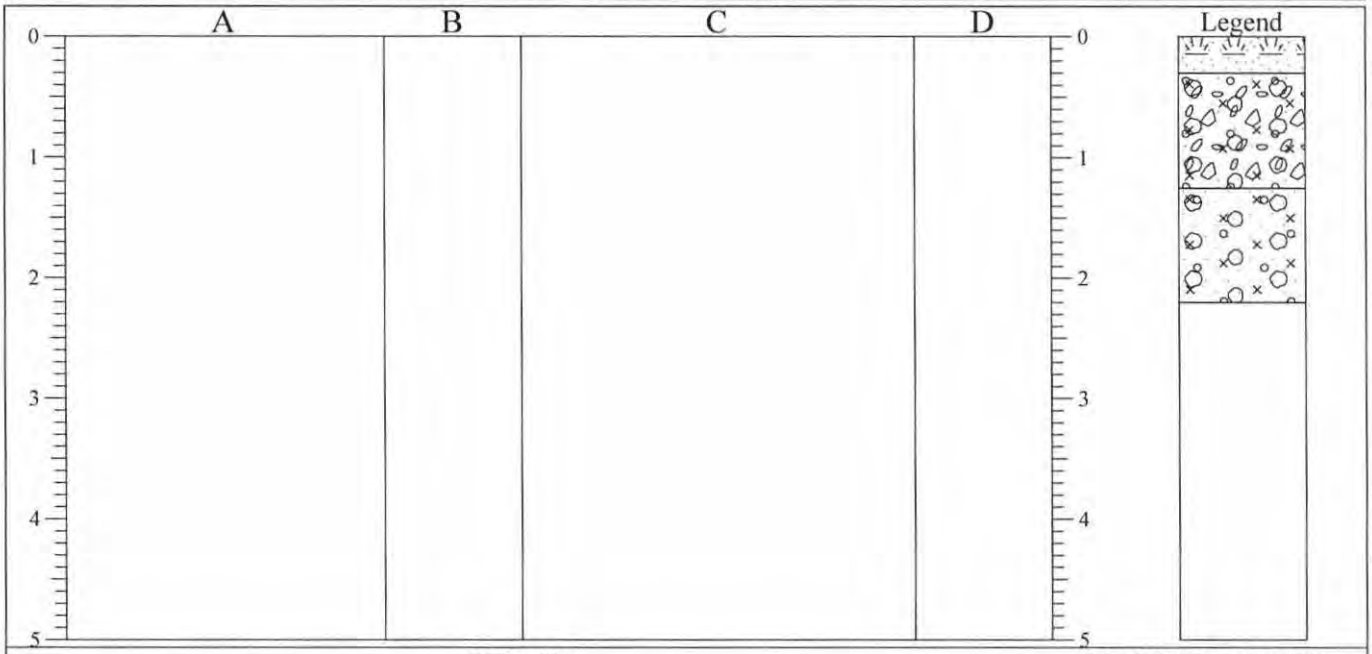
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 717
Job No	Date 09-10-06 09-10-06	Ground Level (m) 19.20	Co-Ordinates () E 124,251.0 N 224,668.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.80m 2nd: 2.20m 3rd:	Rose to (@ 20 min.): 0.78m	Sheet 1 of 1

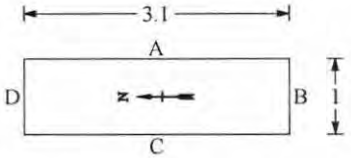


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft wet dark brown slightly sandy gravelly SILT/CLAY with roots (TOPSOIL).			0.20	J	
0.30-1.25		Grey brown silty very sandy GRAVEL with many subrounded to subangular cobbles and some boulders.Boulders up to 600mm long.Gravel is fine.		1.1	0.70	B	
					0.70	J	
1.25-2.20		Grey mottled orange brown gravelly silty SAND with many angular to subangular cobbles and some boulders.Boulders up to 450mm long.		2	1.90	B	
					1.90	J	
2.20		Refusal - possible fractured rock.Pink mottled grey white GRANITE.			2.20	W	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides.Water strikes at 0.80m and 2.20m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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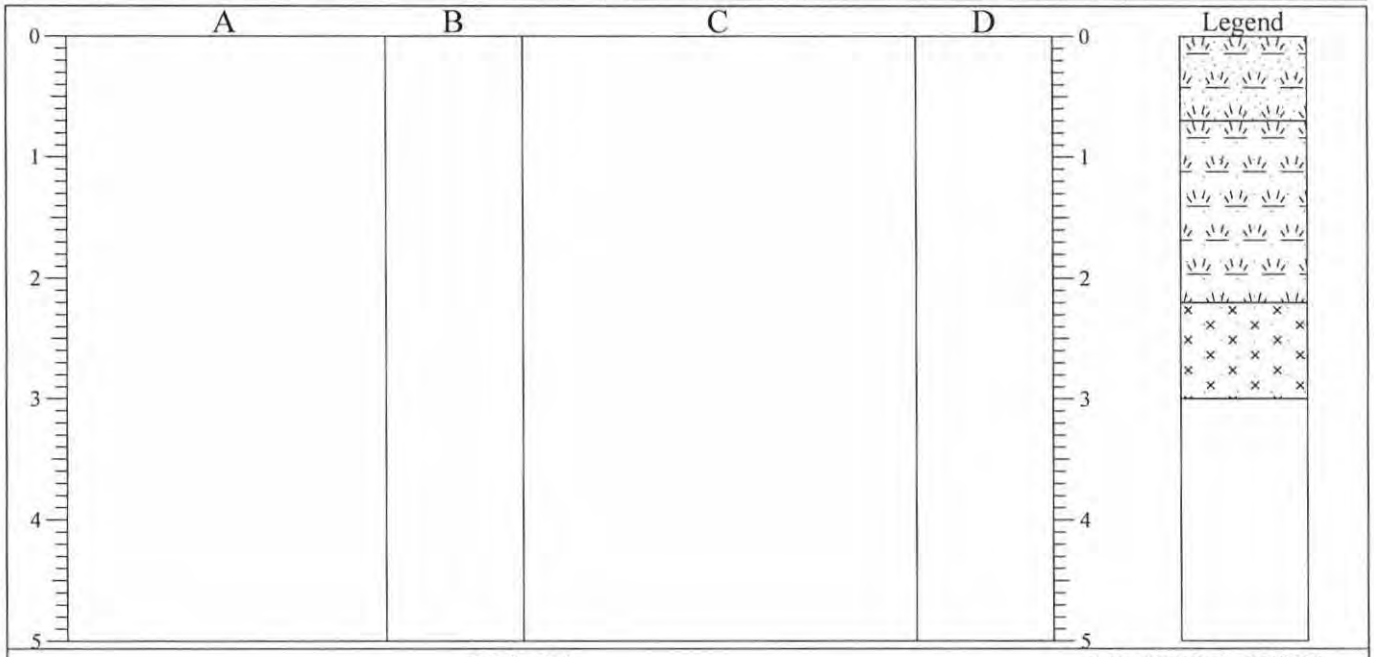
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 718
Job No	Date 09-10-06 09-10-06	Ground Level (m) 18.48	Co-Ordinates () E 124,247.7 N 224,561.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.10m 2nd: 2.20m 3rd:	Rose to (@ 20 min.): 1.04m	Sheet 1 of 1

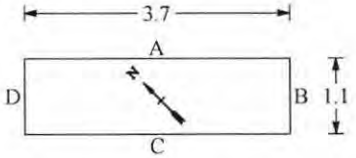


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.70		Firm damp dark brown mottled orange slightly sandy slightly gravelly SILT/CLAY with roots(TOPSOIL).			0.50	B	
0.70-2.20		Very soft dark brown sandy PEAT (H6,B1,P1,W0,N1,TV2,TH3,A0,F2,R1,P0).		1	0.50	J	
					1.50	B	
				2	1.50	J	
2.20-3.00		Firm grey slightly sandy SILT with some roots.Sand is fine.			2.30	W	
					2.50	B	
					2.50	J	
3.00		Refusal - possible rock or boulders.Orange brown mottled grey GRANITE.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation.Water strikes at 1.10 and 2.20m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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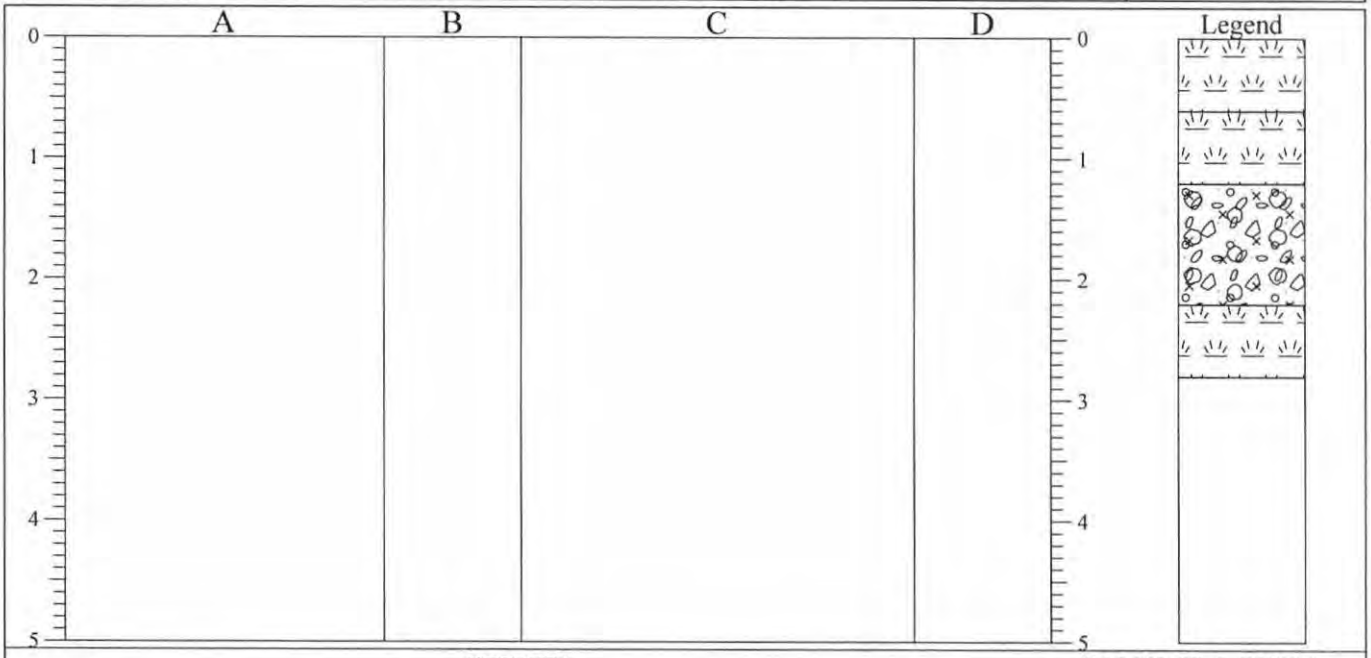
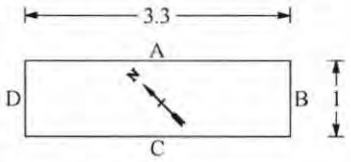
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 719
Job No	Date 09-10-06 09-10-06	Ground Level (m) 18.91	Co-Ordinates () E 124,333.9 N 224,630.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.60m 2nd: 1.80m 3rd:	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA				SAMPLES & TESTS				
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Very soft dark brown PEAT (H4,B1,P0,W1,N1,TV1,TH1,A0,P0).			0.30	J	
0.60-1.20		Very soft dark brown PEAT (H7,B2,F3,W2,N3,TV1,TH1,A1,P1).			0.90	B	
1.20-2.20		Grey mottled pink orange silty very sandy GRAVEL with many subangular to angular cobbles and boulders.Boulders up to 300mm long.Sand is coarse.		1	0.90 1.60 1.60 1.60	J B J W	
2.20-2.80		Grey brown mottled pink orange silty sandy GRAVEL with many subangular to angular AND FLAT cobbles and boulders.Boulders up to 500mm long.			2.50	B	
2.80		Refusal - possible fractured rock.Pinkish orange mottled grey black GRANITE.			2.50	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides from 1.30m.Water strikes at 1.60 and 1.80m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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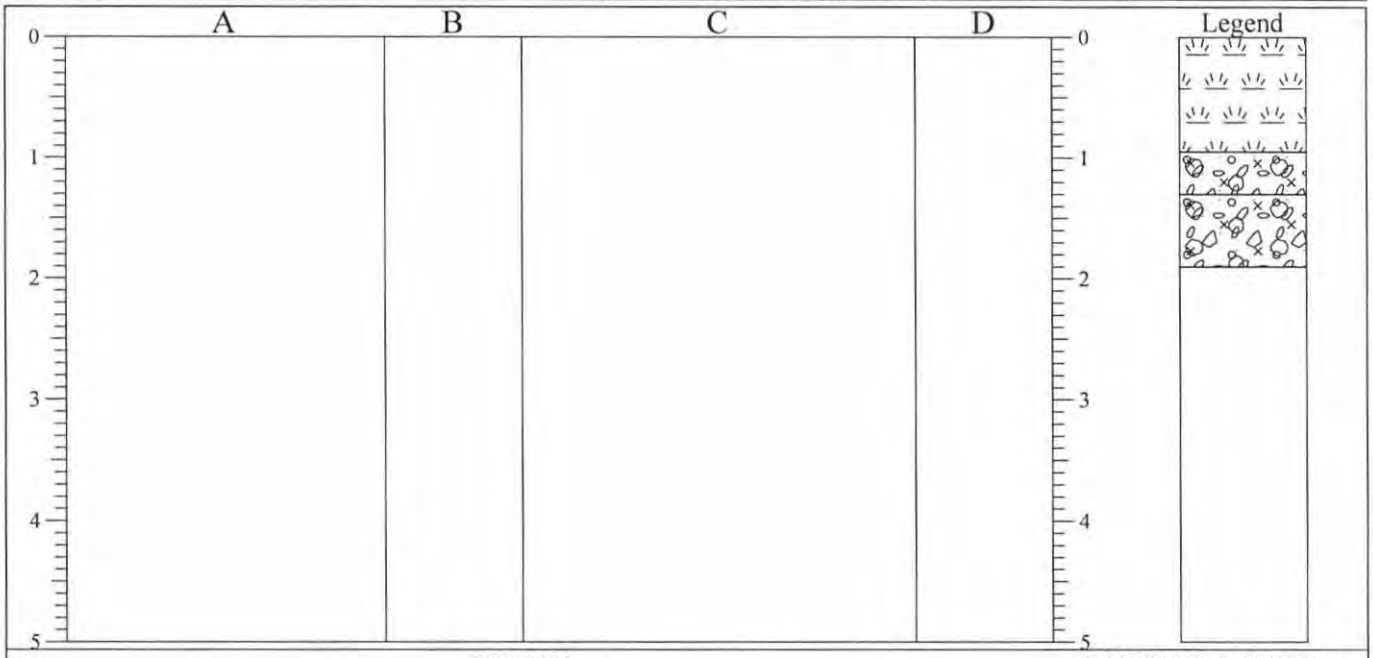
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 720
Job No	Date 09-10-06 09-10-06	Ground Level (m) 21.77	Co-Ordinates () E 124,438.1 N 224,607.1	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.50m 2nd: 0.90m 3rd: 1.30m	Rose to (@ 20 min.): 0.47m	Sheet 1 of 1

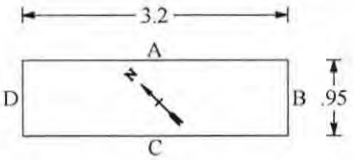


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.95		Very soft dark brown PEAT (H3,B1,P0,W1,N2,TV1,TH2,A2,P0,R2).		1	0.50	B	
				2	0.50	J	
0.95-1.30		Grey mottled brown orange silty very sandy GRAVEL with many subangular to angular cobbles and boulders.Boulders up to 300mm long.Sand is coarse.		3	1.20	B	
1.30-1.90		Grey brown mottled white orange silty sandy GRAVEL with many subangular to angular cobbles and boulders.Boulders up to 450mm long.			1.20	J	
					1.70	B	
1.90		Refusal - possible fractured rock.Pinkish mottled grey white GRANITE.			1.70	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides from 0.90m.Water strikes at 0.50,0.90 and 1.30m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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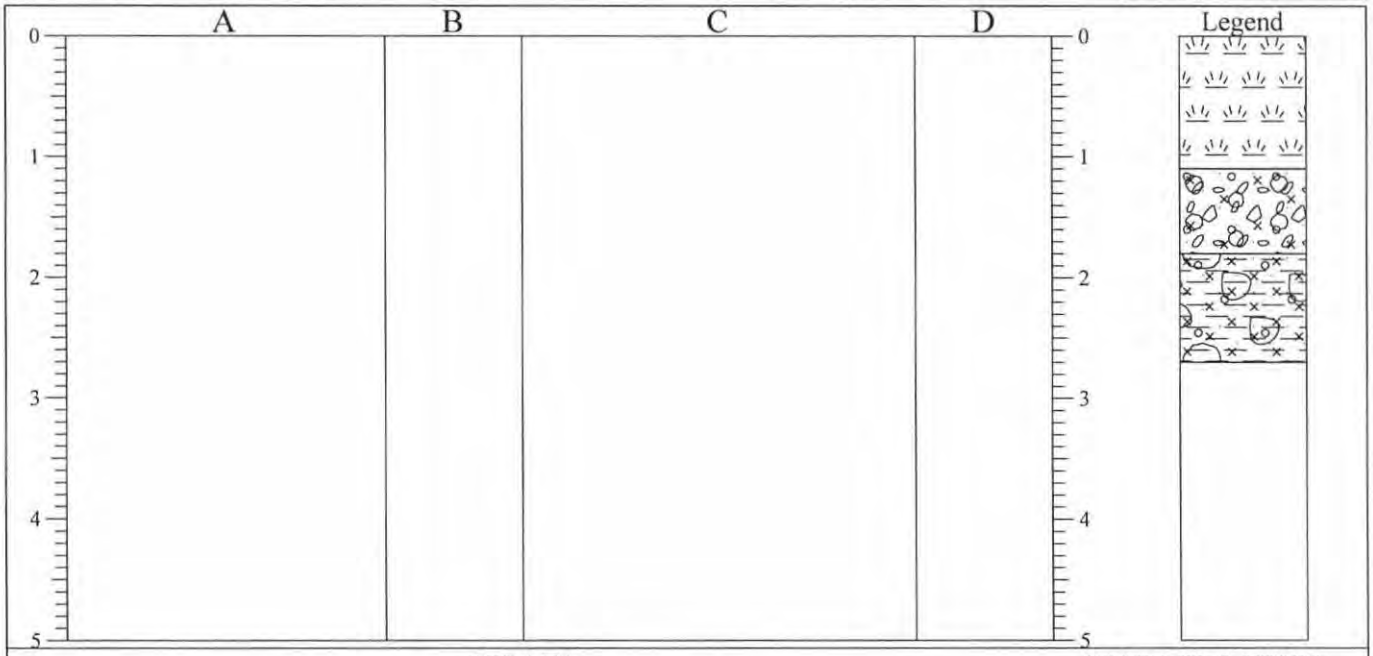
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 721
Job No	Date 09-10-06 09-10-06	Ground Level (m) 21.81	Co-Ordinates () E 124,449.2 N 224,621.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.40m 2nd: 1.20m 3rd: 2.00m	Rose to (@ 20 min.): 0.36m	Sheet 1 of 1



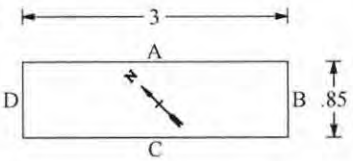
STRATA

Depth	No	DESCRIPTION	In Situ Tests
0.00-1.10		Very soft dark brown PEAT (H4,B1,P0,W0,N1,TV1,TH1,A2,P0,R2).	
1.10-1.80		Grey mottled brown orange slightly silty very sandy GRAVEL with some subangular to angular cobbles and boulders.Boulders up to 500mm long.Sand is coarse.	
1.80-2.70		Stiff grey gravelly very sandy SILT/CLAY with some subangular to angular cobbles and boulders.Boulders up to 400mm long.	
2.70		Refusal - possible fractured rock.Brown mottled grey white GRANITE.	

SAMPLES & TESTS

Water	Depth (m)	No	Remarks/Tests
1 1	0.50	B	
	0.50	J	
2	1.50	B	
	1.50	J	
3	2.20	B	
	2.20	J	
	2.40	W	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides from 1.20m.Water strikes at 0.40,1.20 and 2.00m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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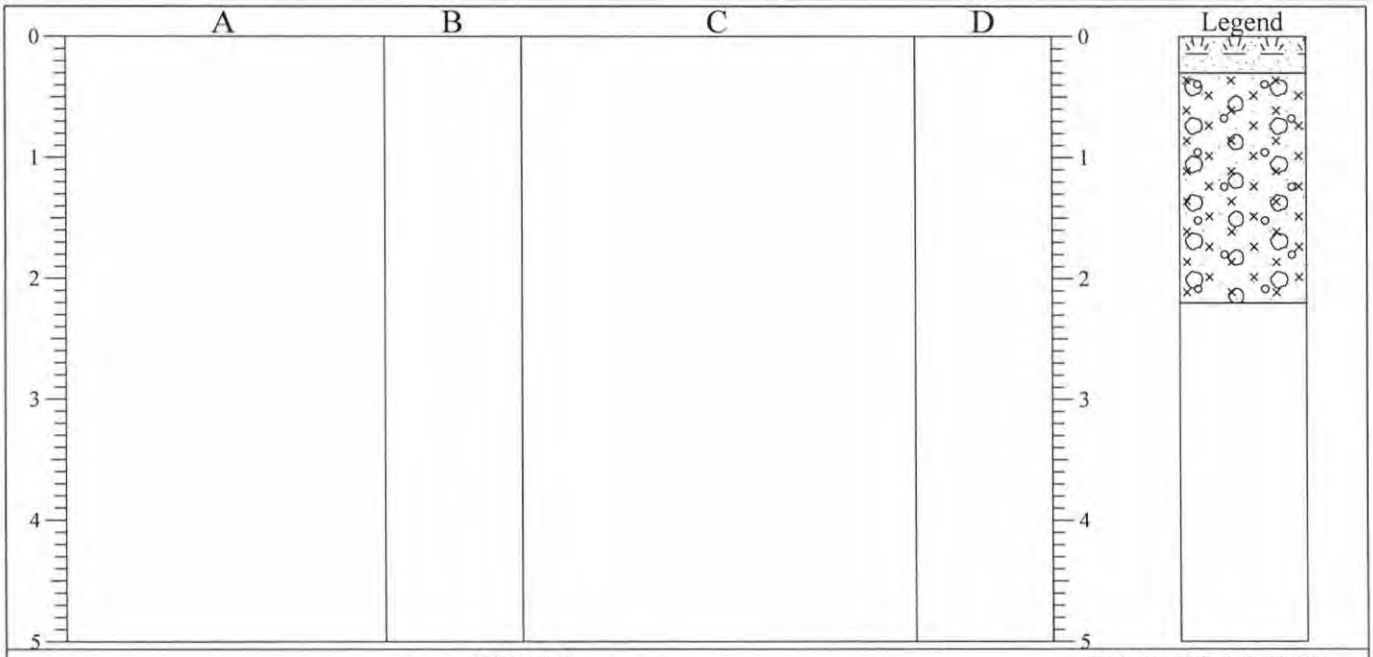
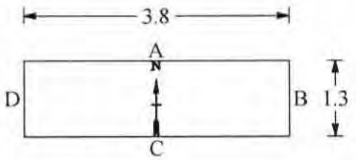
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 908
Job No	Date 09-10-06 09-10-06	Ground Level (m) 7.51	Co-Ordinates () E 127,743.5 N 228,271.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Grass over soft dark brown gravelly SILT/CLAY (TOPSOIL).					
0.30-2.20		Firm cream grey slightly gravelly sandy SILT with some rounded to subrounded cobbles and boulders of limestone. Boulders up to 1300mm long. 0.50 - 1.60 large boulder of limestone in pit on west side.			0.50 0.50	B J	
		1.50 sandy.			1.50 1.50	B J	
2.20		Refusal - possible intact rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry,stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By MM

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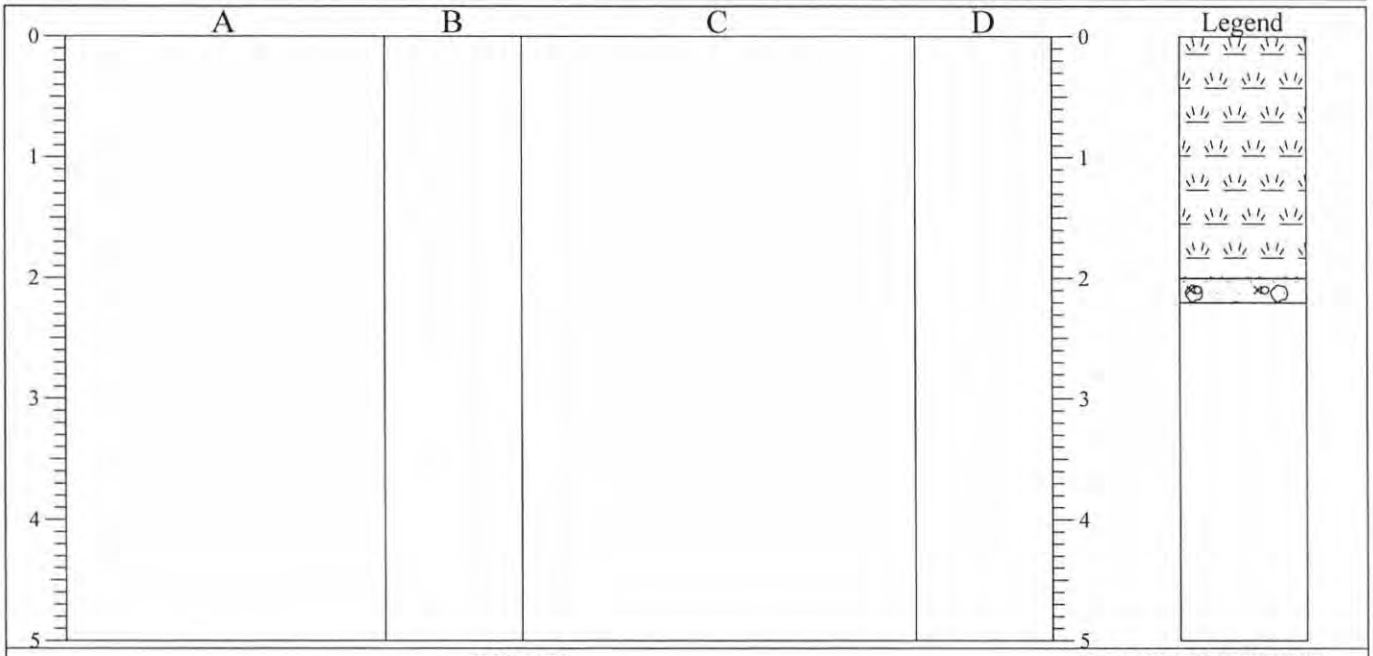
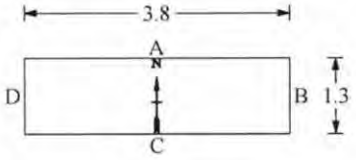
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 909
Job No	Date 09-10-06 09-10-06	Ground Level (m) 6.25	Co-Ordinates () E 127,876.1 N 228,256.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.60m 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA				SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-2.00		Grass over firm black PEAT (H4).					
		0.40 Hand Vane: 11kPa,16kPa,10kPa.			0.50	J	
		1.40 Hand Vane: 8kPa,10kPa,7kPa.		1	1.50	J	
2.00-2.20		Cream blue grey very silty very gravelly SAND with many rounded to subrounded and angular cobbles and boulders of limestone. Boulders up to 400mm long.Sand is medium to coarse. Gravel is rounded to angular.			2.00	B	
2.20		Refusal - possible intact rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation.Water seepage at 1.60m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By MM

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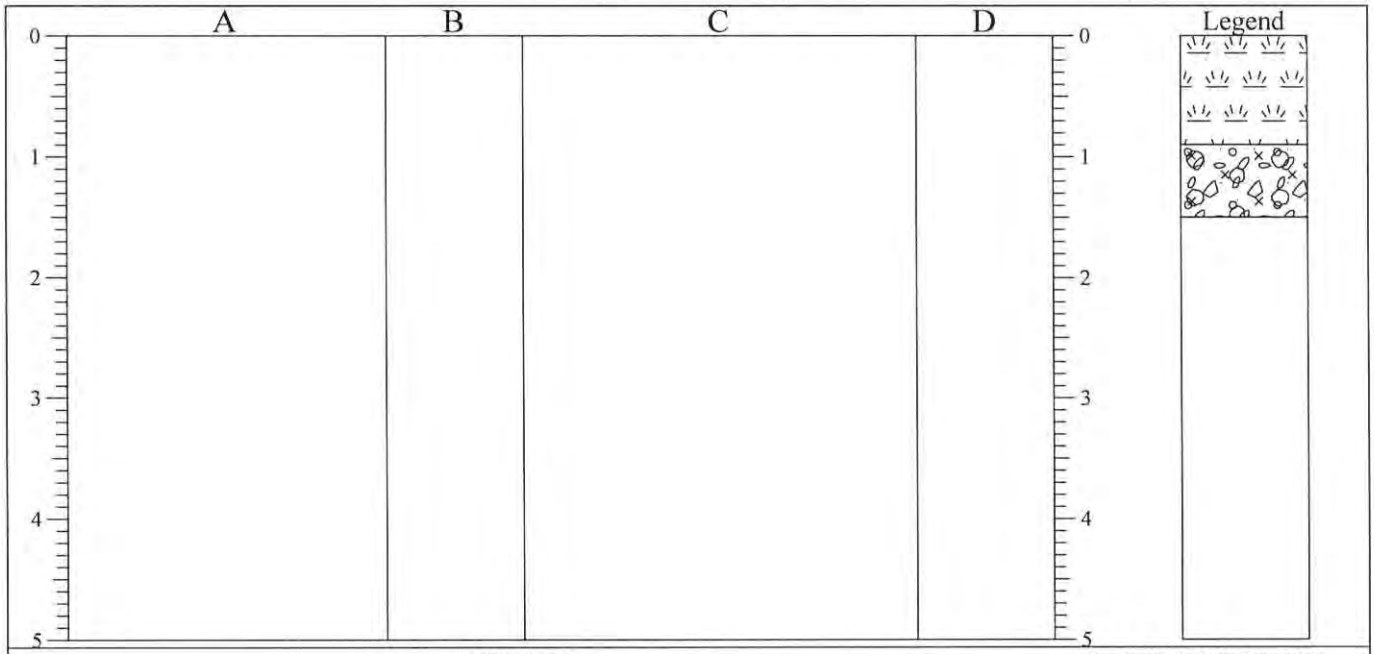
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 909A
Job No	Date 09-10-06 09-10-06	Ground Level (m) 6.54	Co-Ordinates () E 127,873.0 N 228,224.5	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: 0.90m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:	Sheet 1 of 1

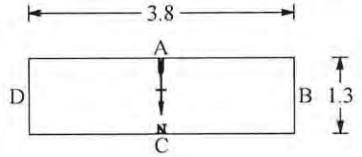


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.90		Soft black pseudoamorphous PEAT (H4). 0.20 Hand Vane: 14kPa,12kPa,10kPa.			0.50	J	
0.90-1.50		Cream blue grey silty sandy GRAVEL with many rounded to subrounded cobbles and boulders of limestone. Boulders up to 400mm long. Gravel is rounded to subrounded,fine to medium. 1.00 Hand Vane: 7kPa,6kPa,10kPa.			1.00	B	
1.50		Refusal - possible intact rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation - spalling of sides.Surface water inflow and water ingress at 0.90m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By MM

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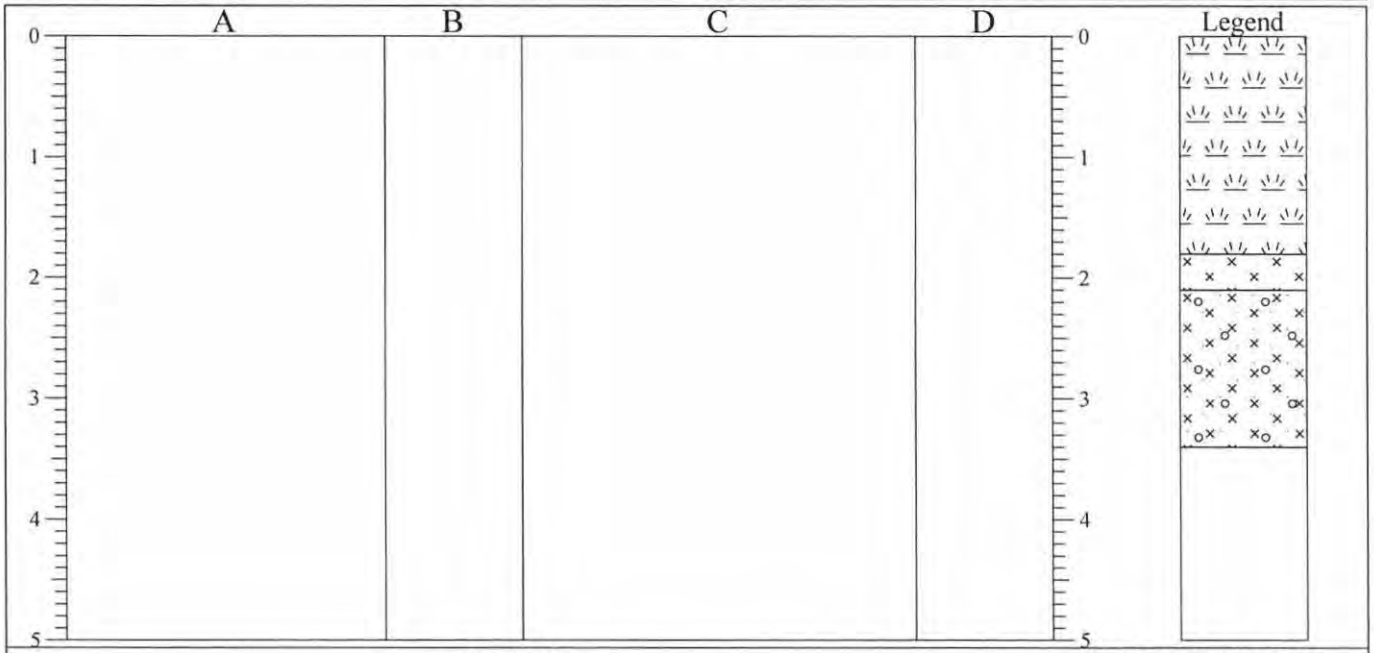
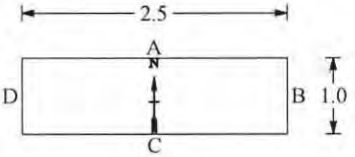
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 932
Job No	Date 26-09-06 26-09-06	Ground Level (m) 6.33	Co-Ordinates () E 128,266.1 N 228,126.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 2.10m 2nd: 3rd:	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA				SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.80		Very soft dark brown fibrous PEAT with roots.			1.00	J	
					1.50	B	
1.80-2.10		Very soft cream white fibrous organic SILT with shells.		1			
2.10-3.40		Soft grey slightly sandy slightly gravelly SILT with rootlets.			2.00	J	
					2.50	B	
		3.00 Hand Vane: 7kPa,8kPa,7kPa.			3.00	J	
3.40		Pit terminated.			3.40	B	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable from 3.20m during excavation.Water seepage at 2.10m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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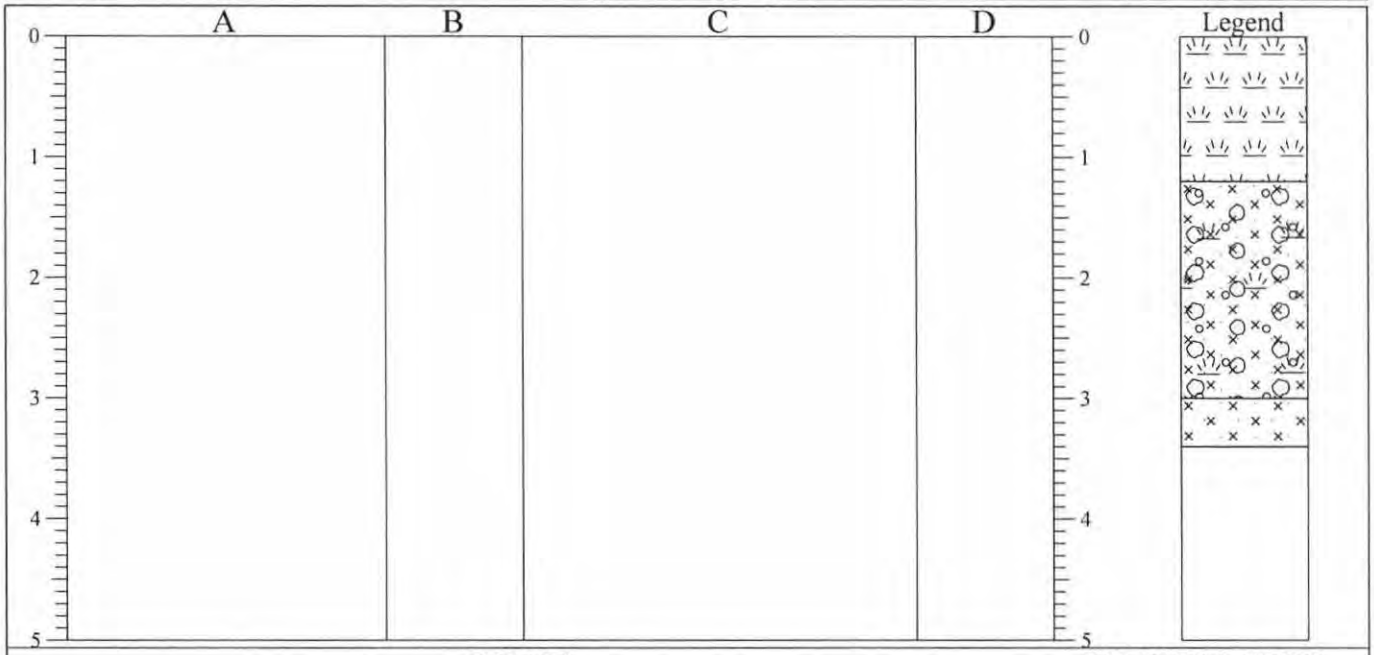
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 935
Job No	Date 25-09-06 25-09-06	Ground Level (m) 6.16	Co-Ordinates () E 128,272.5 N 228,106.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

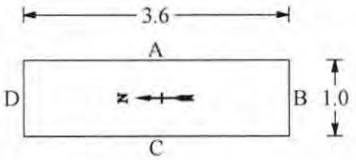


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.20		Very soft dark brown fibrous PEAT with roots.			0.50	J	
1.20-3.00		Very soft cream white fibrous slightly gravelly sandy organic SILT/PEAT with shells.			1.50	B	
					2.50	J	
3.00-3.40		Soft dark grey slightly sandy SILT with rootlets.			3.00	B	
3.40		Pit terminated.			3.35-3.40	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit very unstable from 1.00m during excavation.Surface water ingress during excavation.Pit fenced.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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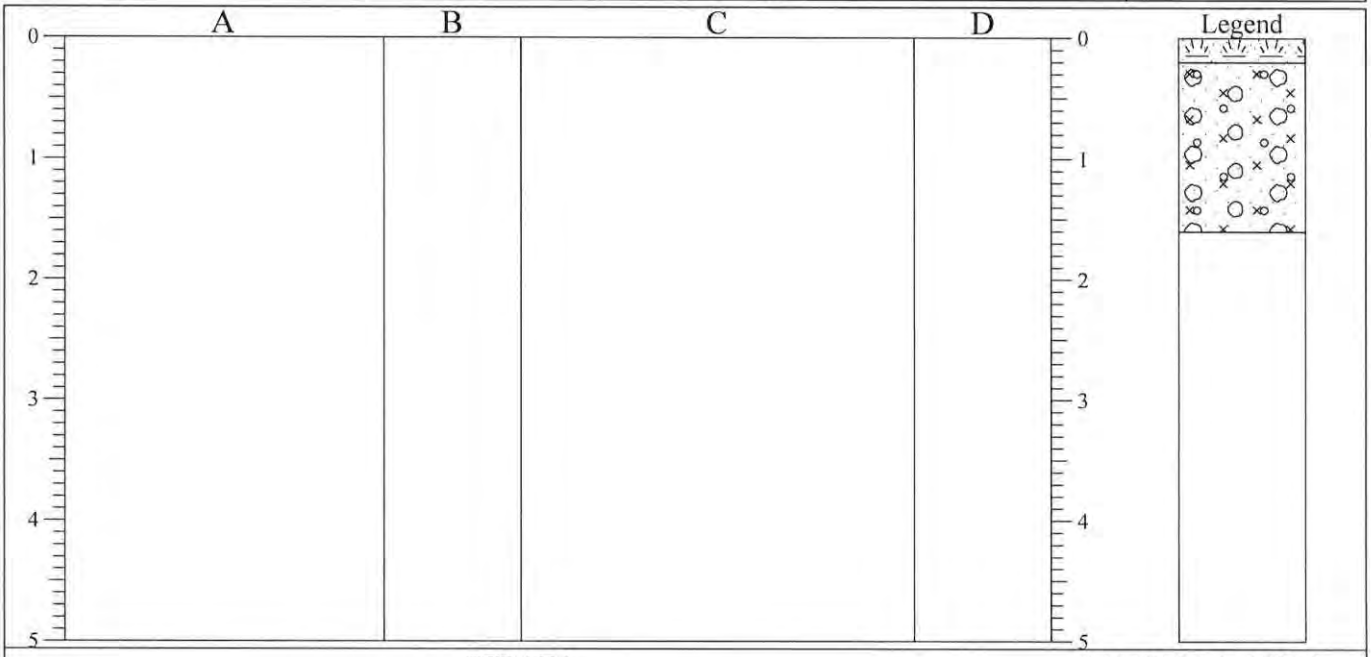
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 941
Job No	Date 22-09-06 22-09-06	Ground Level (m) 6.92	Co-Ordinates () E 128,364.7 N 228,139.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 1.50m 2nd: 3rd:	Rose to (@ 20 min.): 1.34m	Sheet 1 of 1

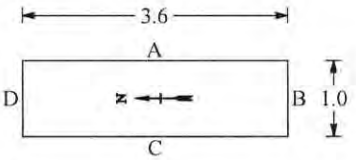


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		Soft dark brown peaty CLAY with roots (TOPSOIL).			0.00-0.20	J	
0.20-1.60		Grey silty very gravelly medium SAND with some limestone cobbles and boulders. Cobbles and boulders are rounded to subangular. Boulders up to 500mm long.			0.30	B	
					0.50	J	
				1	1.00	J	
1.60		TP abandoned at 1.6m bgl. Obstruction - probable boulder.			1.50	B	
					1.50	W	
					1.60	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation. Wateringress at 1.50m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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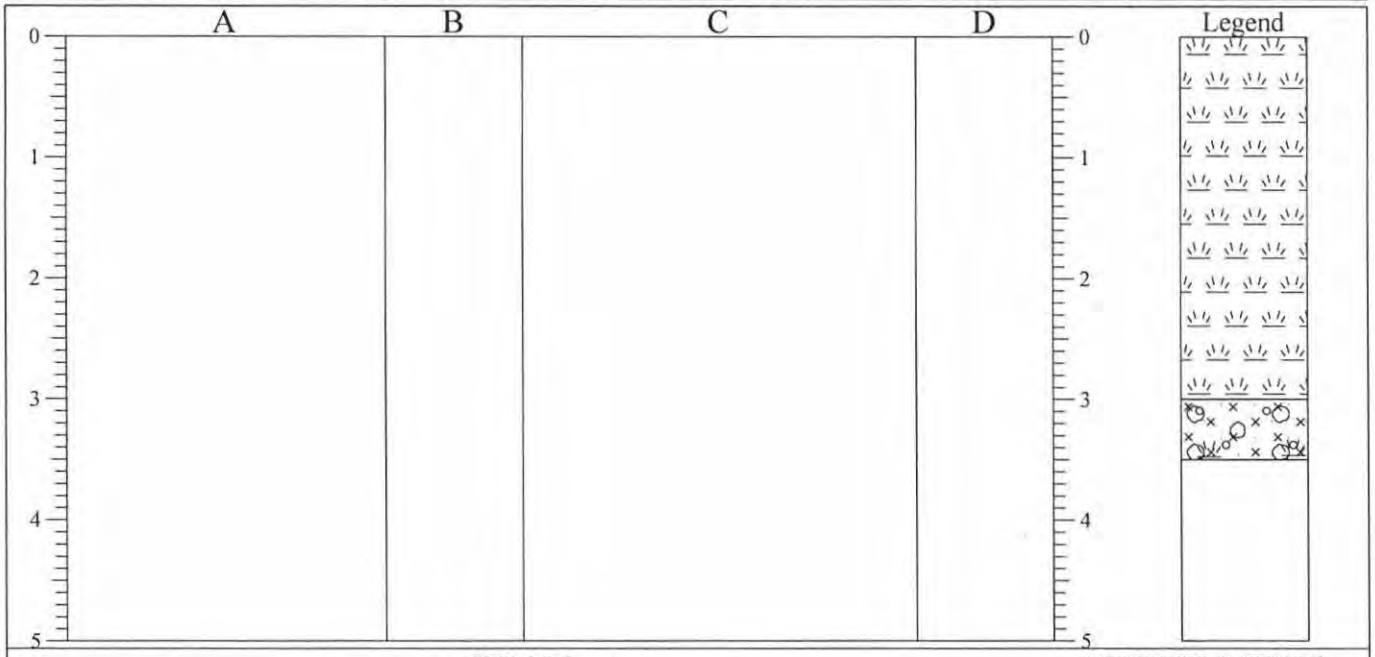
TRIAL PIT LOG

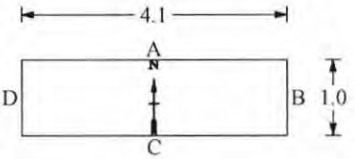
Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 941A
Job No	Date 25-09-06 25-09-06	Ground Level (m) 6.50	Co-Ordinates () E 128,335.7 N 228,115.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA / SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-3.00		Very soft dark brown fibrous PEAT with roots (H7,B1,F3,R1,W1,N1).			0.50	J	
					1.50	B	
					2.00	J	
3.00-3.50		Soft cream white grey fibrous slightly gravelly sandy organic SILT/PEAT with roots.			3.00	B	
3.50		Pit terminated - constant collapse of pit and surface water ingress.			3.50	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit very unstable from 0.30m during excavation.Surface water ingress during excavation.Pit fenced.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

IDL
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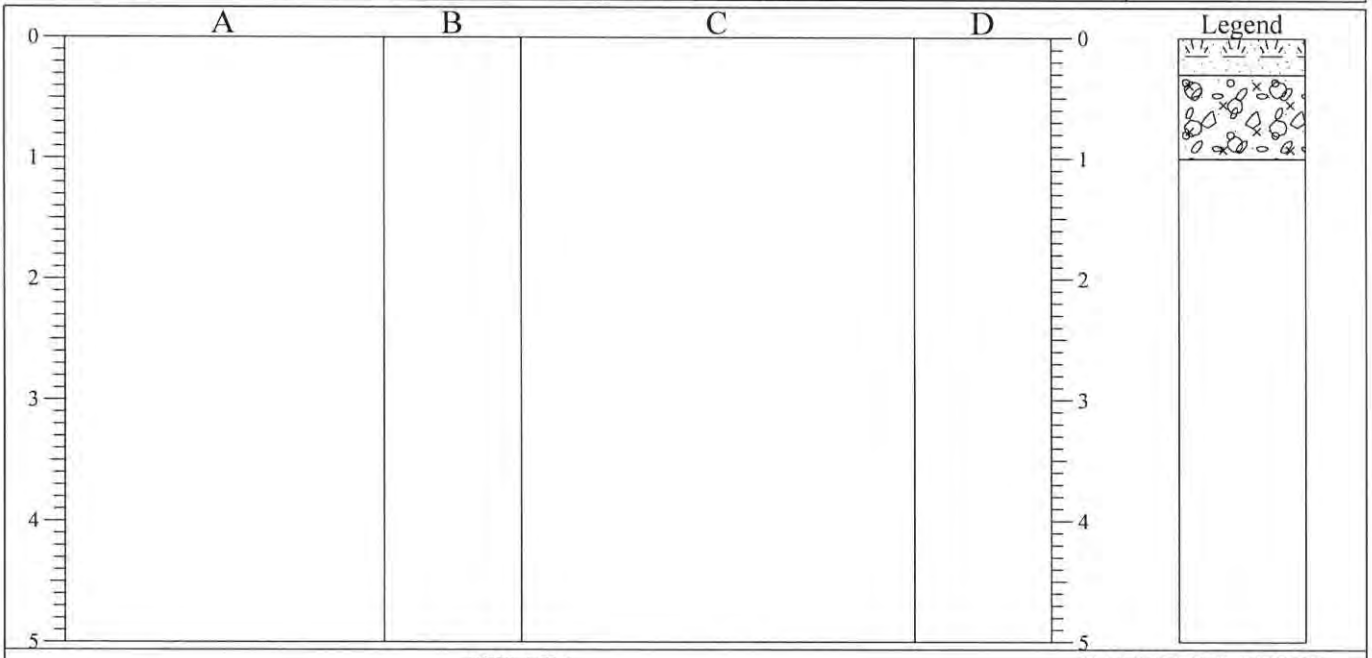
Telephone: 091 841274
Fax: 091 847687

TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 944
Job No	Date 22-09-06 22-09-06	Ground Level (m) 10.83	Co-Ordinates () E 128,461.6 N 228,090.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

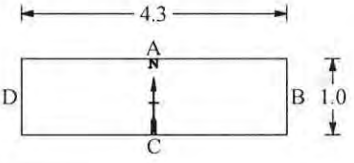


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft brown sandy clayey TOPSOIL.					
0.30-1.00		Grey brown silty very sandy medium GRAVEL with some limestone cobbles and boulders. Cobbles and boulders are tabular to subangular. Gravel is subrounded to subangular,coarse grained.Boulders up to 400mm long.			0.30 0.50	J B	
1.00		TP abandoned at 1.0m bgl. Obstruction - probable limestone rock.			0.90	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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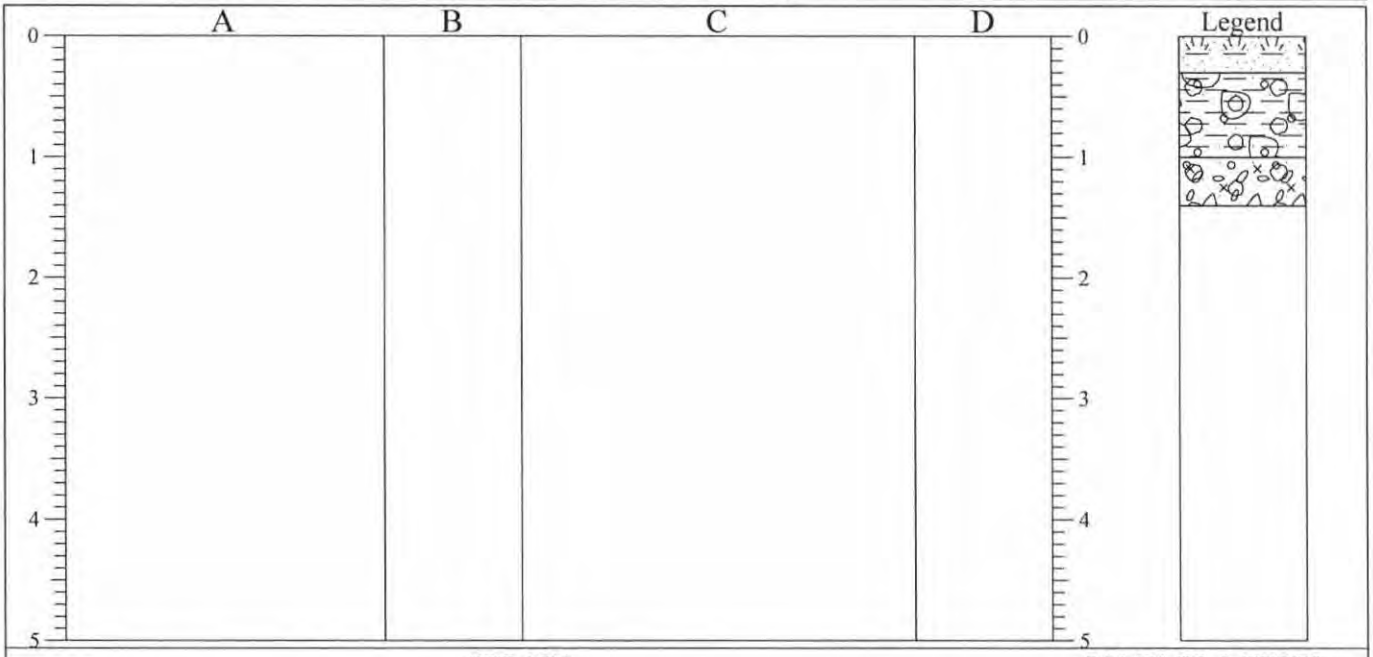
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 945
Job No	Date 22-09-06 22-09-06	Ground Level (m) 13.22	Co-Ordinates () E 128,498.8 N 228,097.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

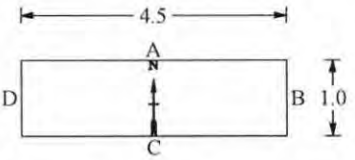


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft brown sandy clayey TOPSOIL.			0.00-0.30	J	
0.30-1.00		Firm grey brown sandy gravelly CLAY with some limestone cobbles and boulders. Cobbles and boulders are tabular to subangular. Gravel is subrounded to subangular and tabular,coarse grained.Boulders up to 400mm long.			0.50	B	
1.00-1.40		Grey brown silty SAND and GRAVEL with many limestone cobbles and boulders. Cobbles and boulders are tabular to subangular.Boulders up to 300-600mm long.			1.00 1.00-1.40	B J	
1.40		TP abandoned at 1.4m bgl. Obstruction - possible limestone rock.			1.40	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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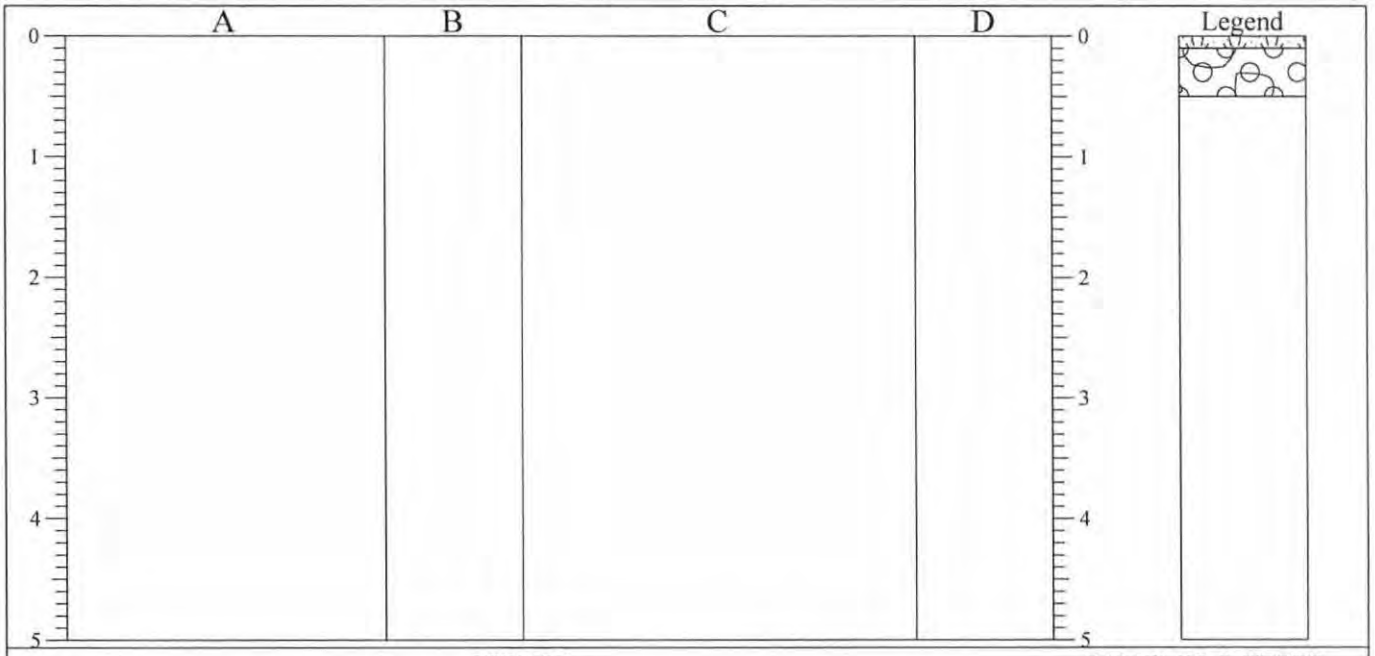
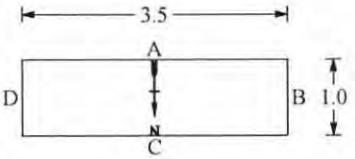
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 948
Job No	Date 22-09-06 22-09-06	Ground Level (m) 15.73	Co-Ordinates () E 128,535.9 N 228,053.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Brown sandy clayey TOPSOIL.					
0.10-0.50		Possible rock - recovered as tabular to subangular COBBLE and BOULDER fragments of limestone.Boulders up tp 400mm long.			0.40	J	
0.50		TP abandoned at 0.5m bgl. Obstruction - possible bedrock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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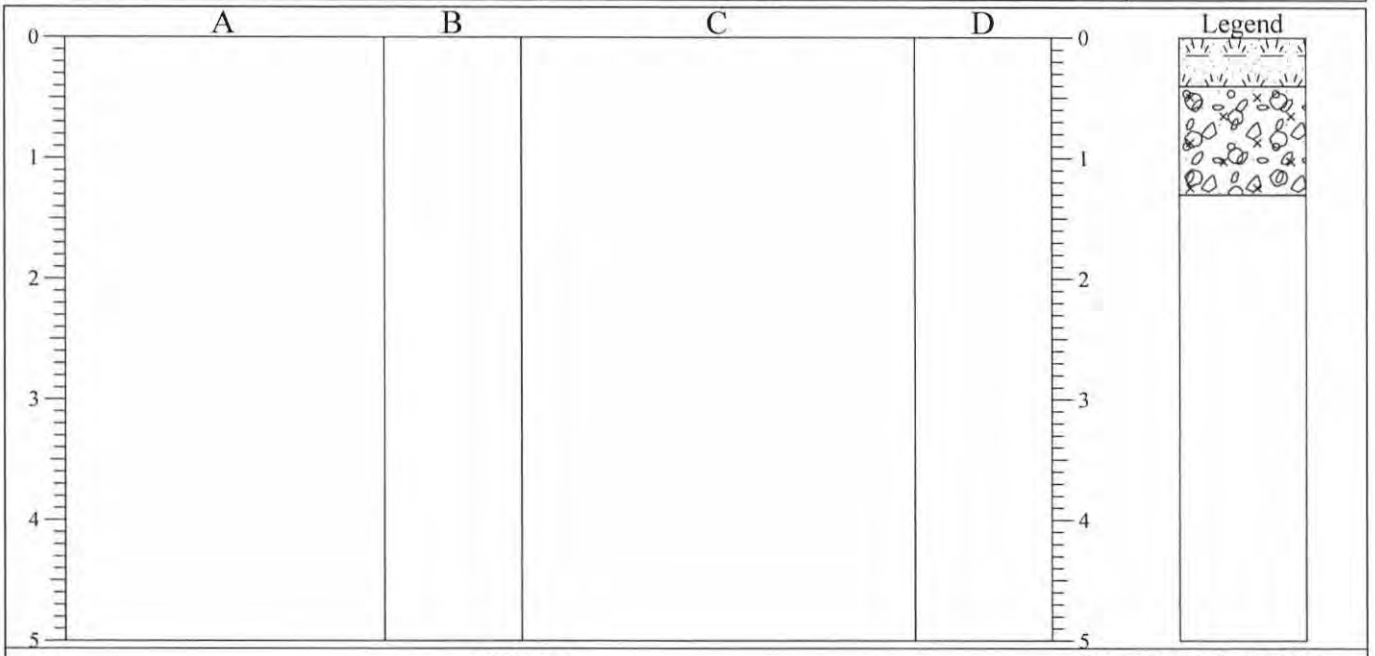
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 951
Job No	Date 26-09-06 26-09-06	Ground Level (m) 17.17	Co-Ordinates () E 128,646.9 N 228,010.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

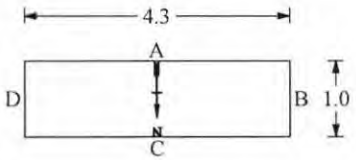


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.40		Soft brown sandy clayey TOPSOIL.					
0.40-1.30		Grey silty very sandy GRAVEL with some limestone cobbles and boulders. Cobbles are rounded to subrounded. Gravel is subrounded to subangular,coarse grained.Boulders are tabular to subangular,500-800mm long.			0.30	J	
					1.00	B	
1.30		Refusal - possible rock or boulders.			1.25	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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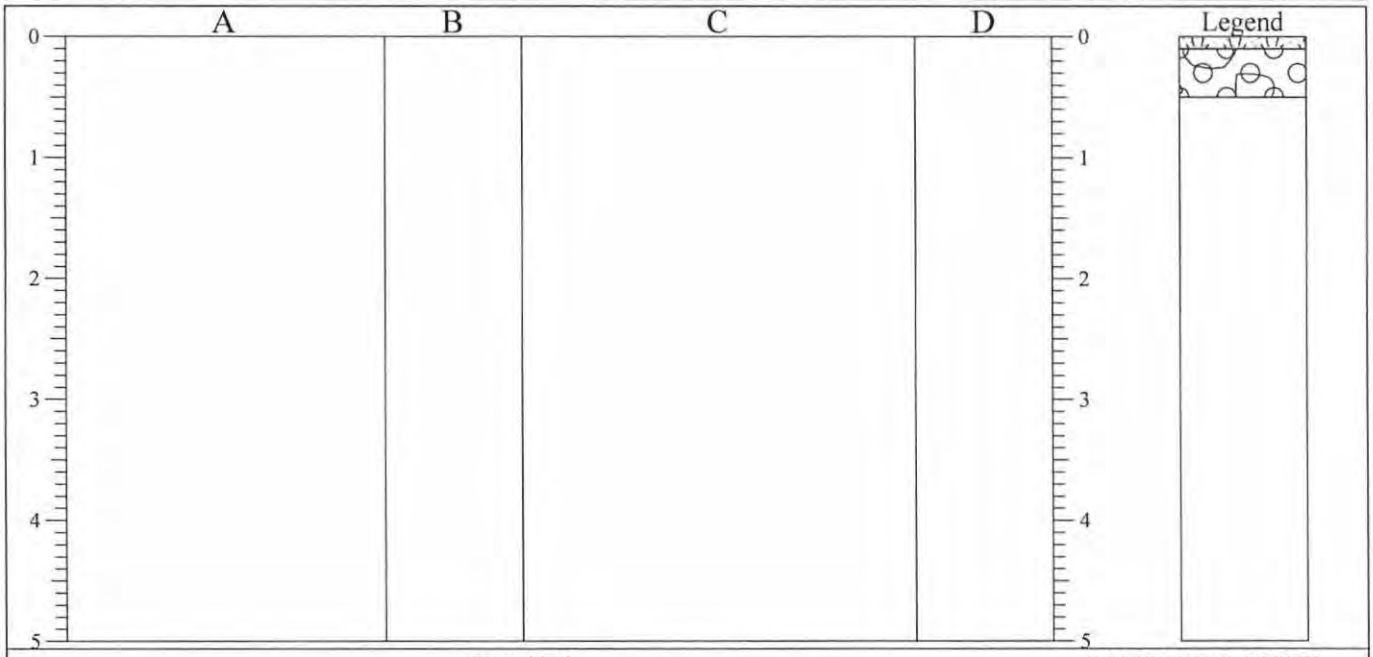
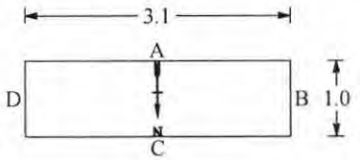
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 953
Job No	Date 27-09-06 27-09-06	Ground Level (m) 14.98	Co-Ordinates () E 128,707.9 N 227,995.1	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA					SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Soft brown sandy clayey TOPSOIL.			0.00-0.10	J	
0.10-0.50		Possible rock - recovered as COBBLES and BOULDERS of limestone. Cobbles and boulders are tabular to subangular. Boulders 600-1500mm long.					
0.50		Refusal - possible rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

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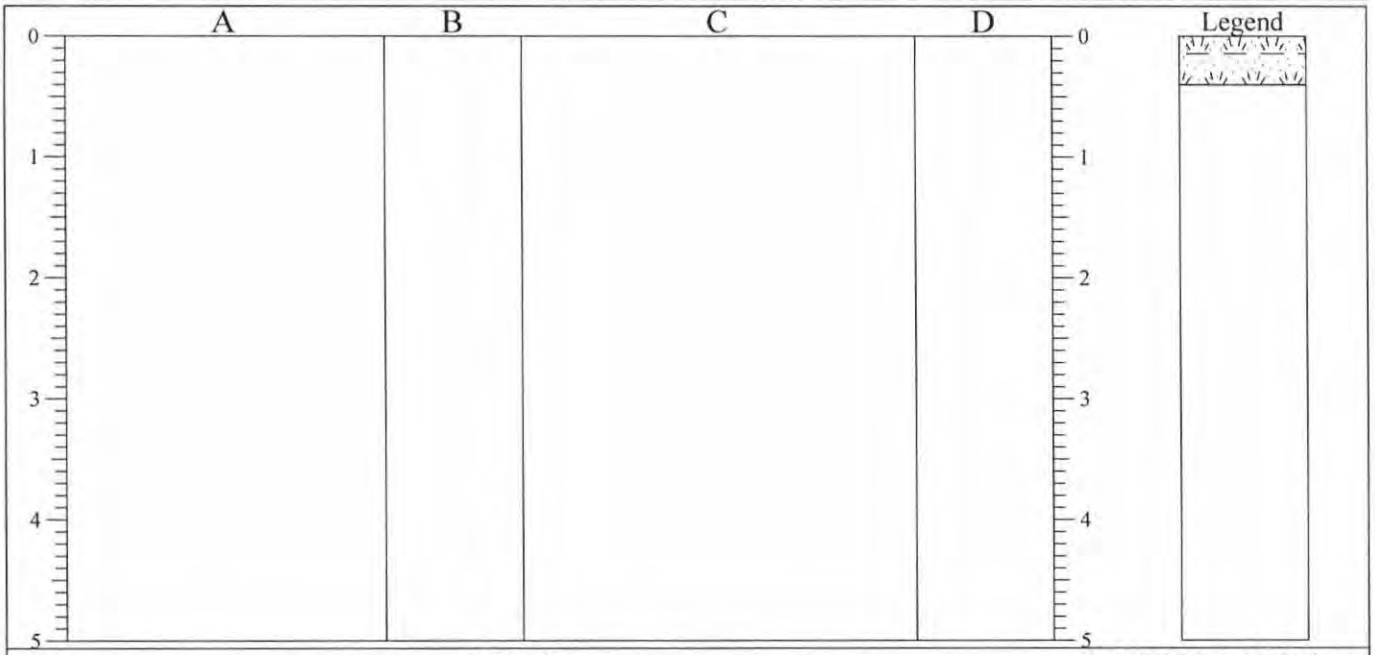
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 956
Job No	Date 27-09-06 27-09-06	Ground Level (m) 10.57	Co-Ordinates () E 128,861.7 N 228,000.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

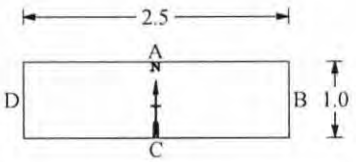


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.40		Soft brown sandy clayey TOPSOIL with roots.					
0.40		Refusal - possible rock.Observed as grey limestone (unable to excavate).					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Kobelco Mark IV	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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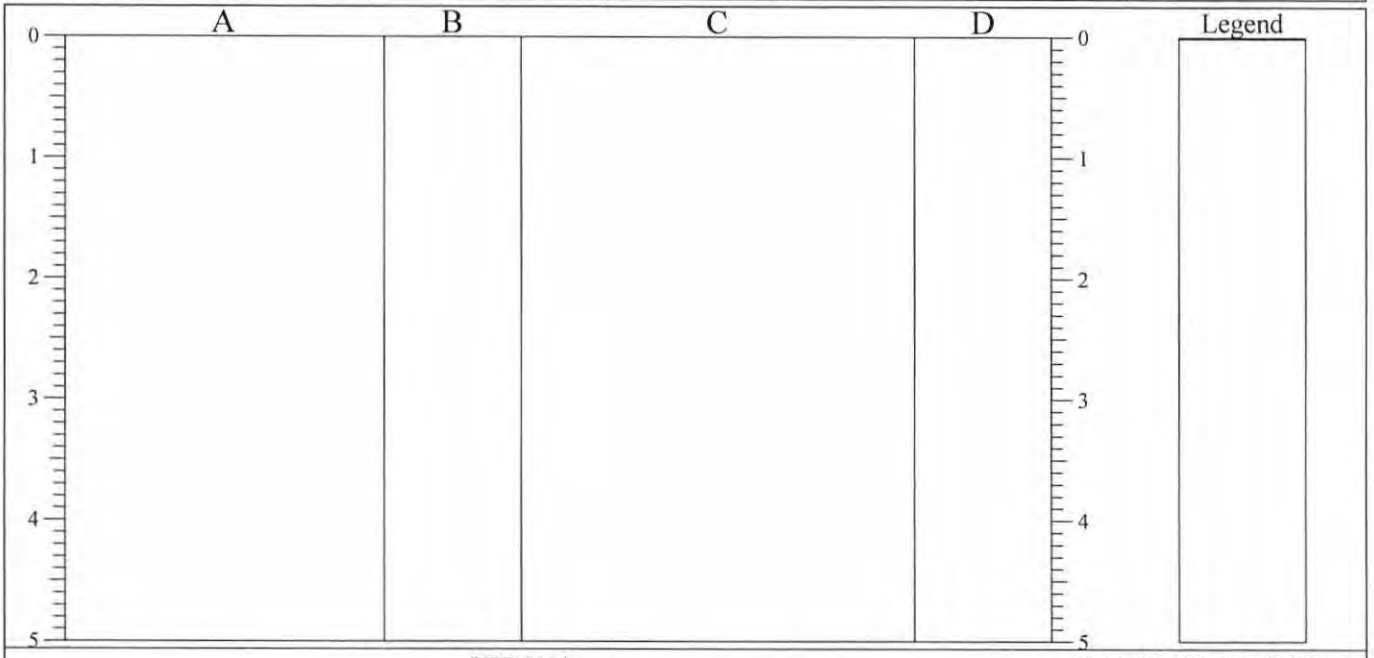
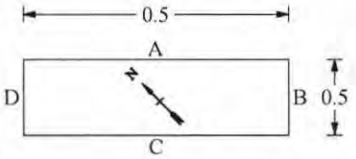
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 957
Job No	Date 14-11-06 14-11-06	Ground Level (m) 11.15	Co-Ordinates () E 128,933.3 N 228,009.2	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd: Rose to (@ 20 min.): Sealed at:			Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.01		TOPSOIL - soft damp brown slightly sandy slightly gravelly CLAY with rootlets.					
0.01		Refusal - intact rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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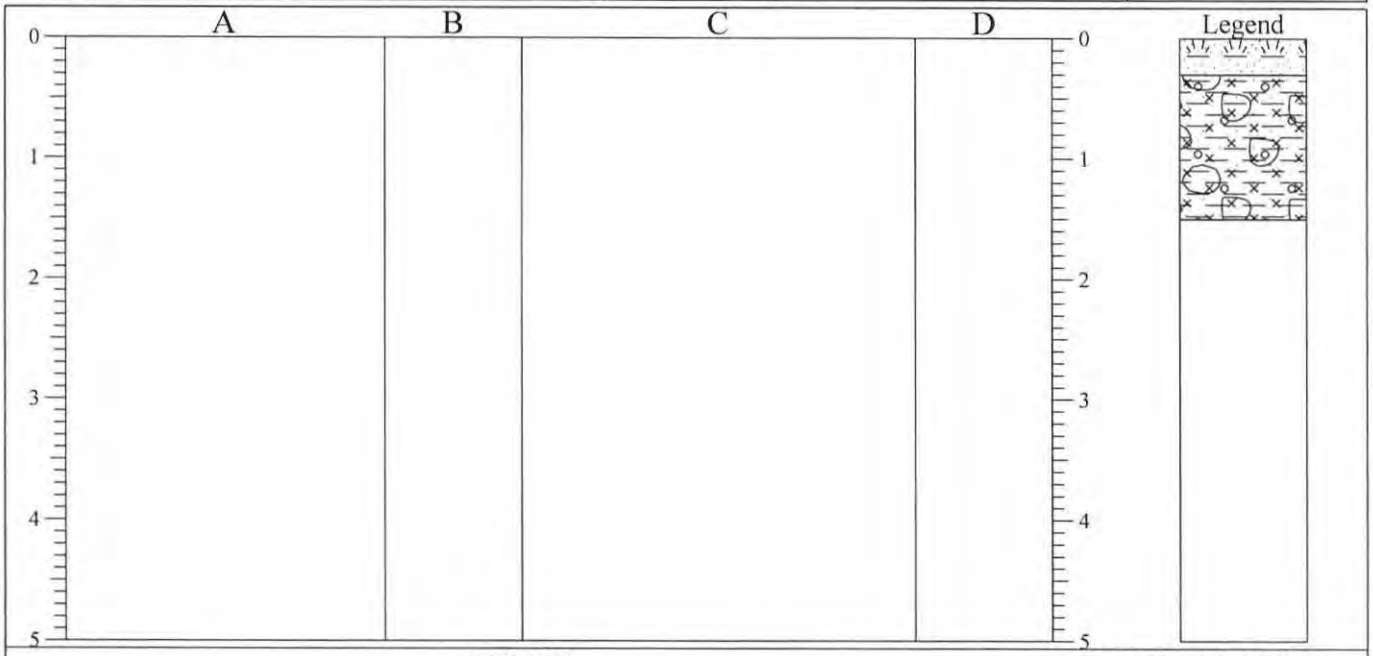
TRIAL PIT LOG

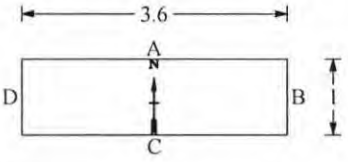
Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 958
Job No	Date 14-11-06 14-11-06	Ground Level (m) 6.53	Co-Ordinates () E 129,019.6 N 228,018.3	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: 1.50m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:	Sheet 1 of 1



STRATA — SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		TOPSOIL - soft dark brown peaty clay.					
0.30-1.50		Firm to stiff grey brown slightly sandy gravelly SILT/CLAY with some subangular to subrounded cobbles and subangular to tabular boulders of limestone.Boulders up to 1000mm long.Gravel is coarse.			0.50	B	
1.50		Refusal - possible rock or boulders.		▼	1.50	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation.Slight inflow at 1.50m depth.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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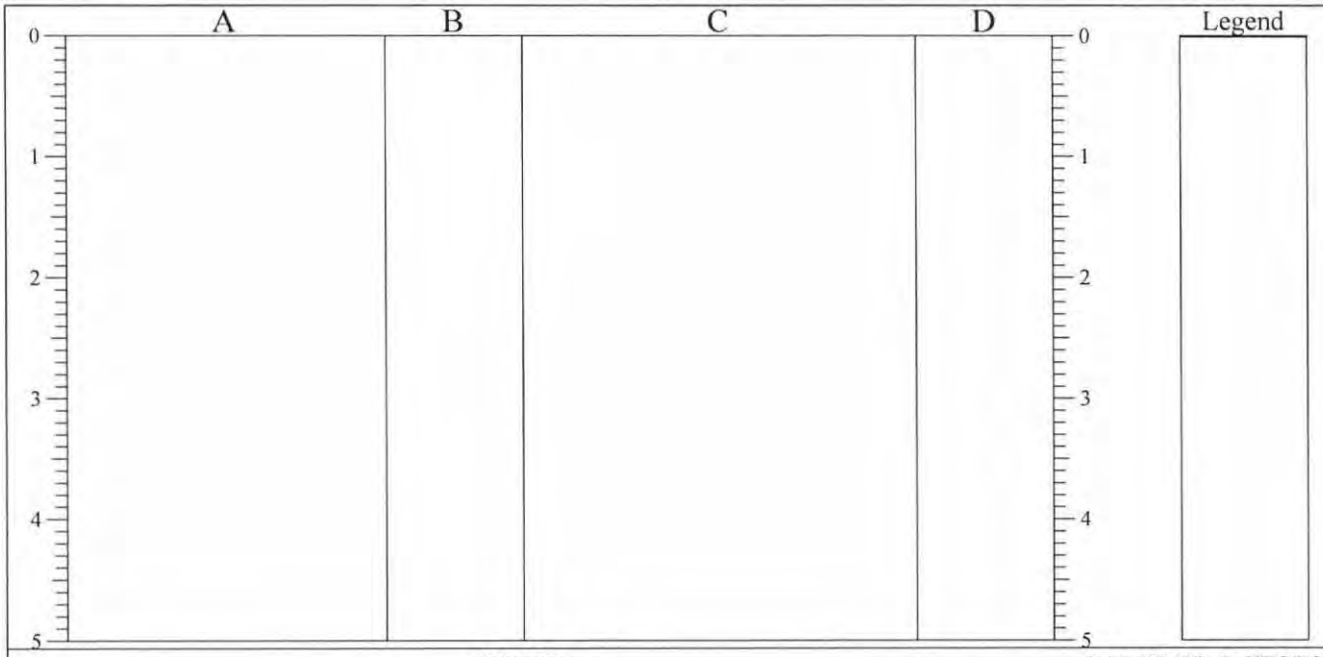
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 960
Job No	Date 19-10-06 19-10-06	Ground Level (m) 22.50	Co-Ordinates () E 129,139.9 N 228,062.1	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:	Sheet 1 of 1

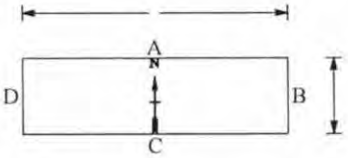


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.01		Rock Outcrop					
0.01		Refusal.					

Shoring/Support:
Stability:



GENERAL REMARKS

Limestone bedrock at surface.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 19/02/07

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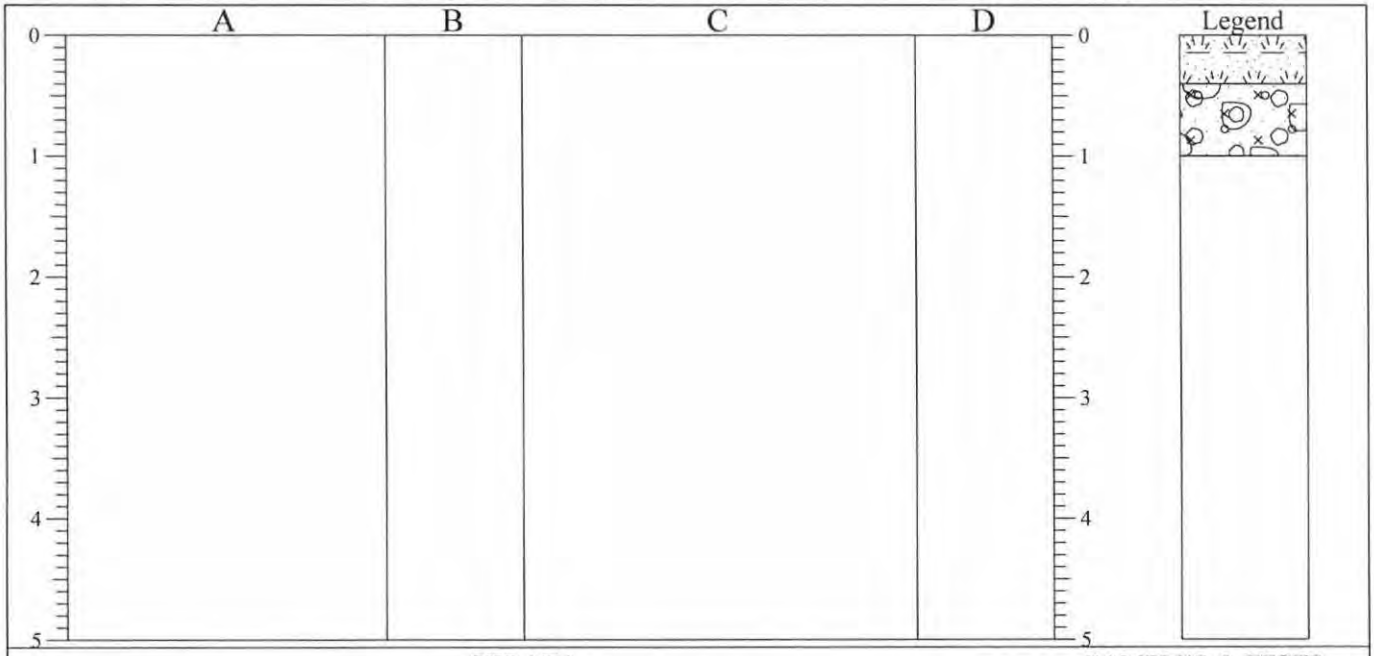
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 962
Job No	Date 25-10-06 25-10-06	Ground Level (m) 15.20	Co-Ordinates () E 129,204.5 N 228,082.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

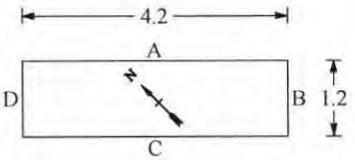


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.40		Topsoil with roots -recovered as firm damp brown slightly sandy gravelly CLAY with some rounded to angular cobbles and boulders.Boulders up to 400mm long.			0.20	J	
0.40-1.00		Light brown mottled orange grey very gravelly very silty medium to coarse SAND with some subangular to subrounded cobbles and boulders.Boulders up to 400mm long.			0.60	B	
					0.60	J	
1.00		Refusal - intact rock.Grey black limestone.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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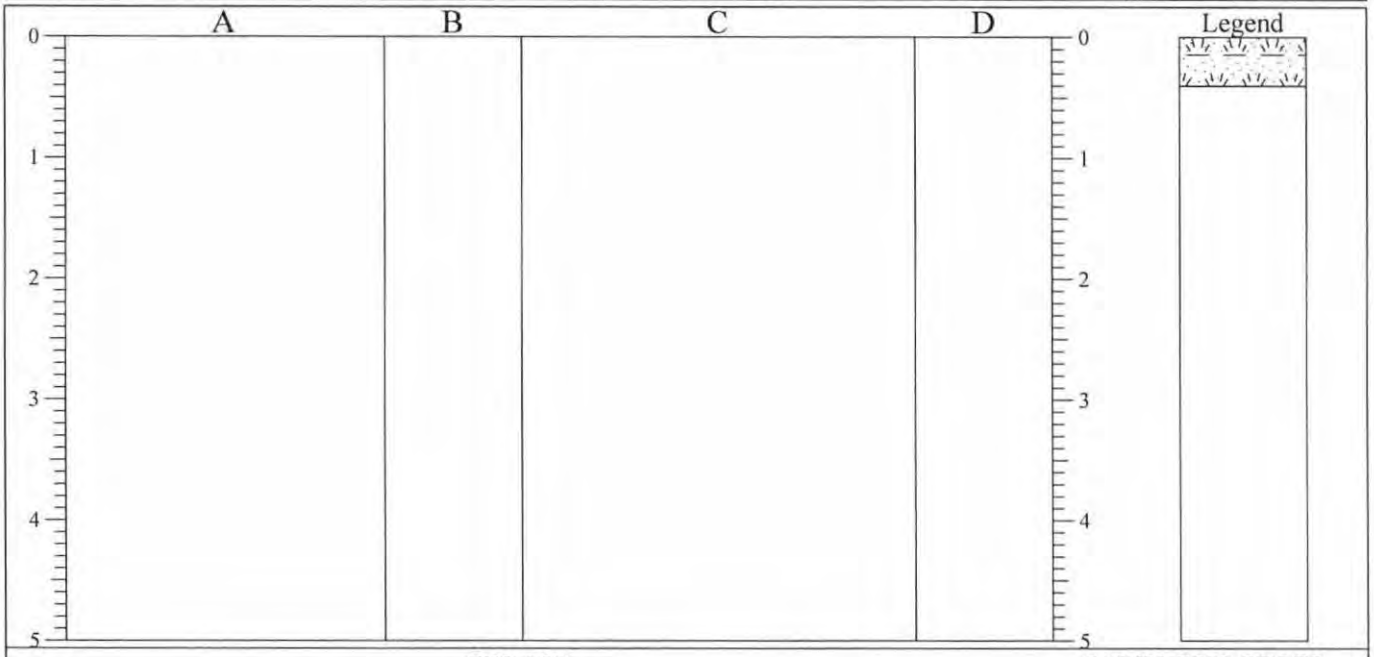
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 964
Job No	Date 26-10-06 / 26-10-06	Ground Level (m) 10.16	Co-Ordinates () E 129,305.3 N 228,092.2	
Contractor: IDL	GROUNDWATER STRIKES — Water strikes: 1st: dry; 2nd:; 3rd: — Rose to (@ 20 min.): — Sealed at:			Sheet: 1 of 1



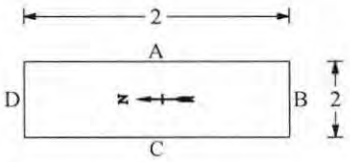
STRATA

Depth	No	DESCRIPTION	In Situ Tests	Water
0.00-0.40		Soft damp brown slightly sandy gravelly SILT/CLAY with some subangular to angular cobbles and boulders (TOPSOIL).Boulders up to 1100mm long.		
0.40		Refusal - possible intact rock (fractured grey limestone).		

SAMPLES & TESTS

Depth (m)	No	Remarks/Tests
0.25	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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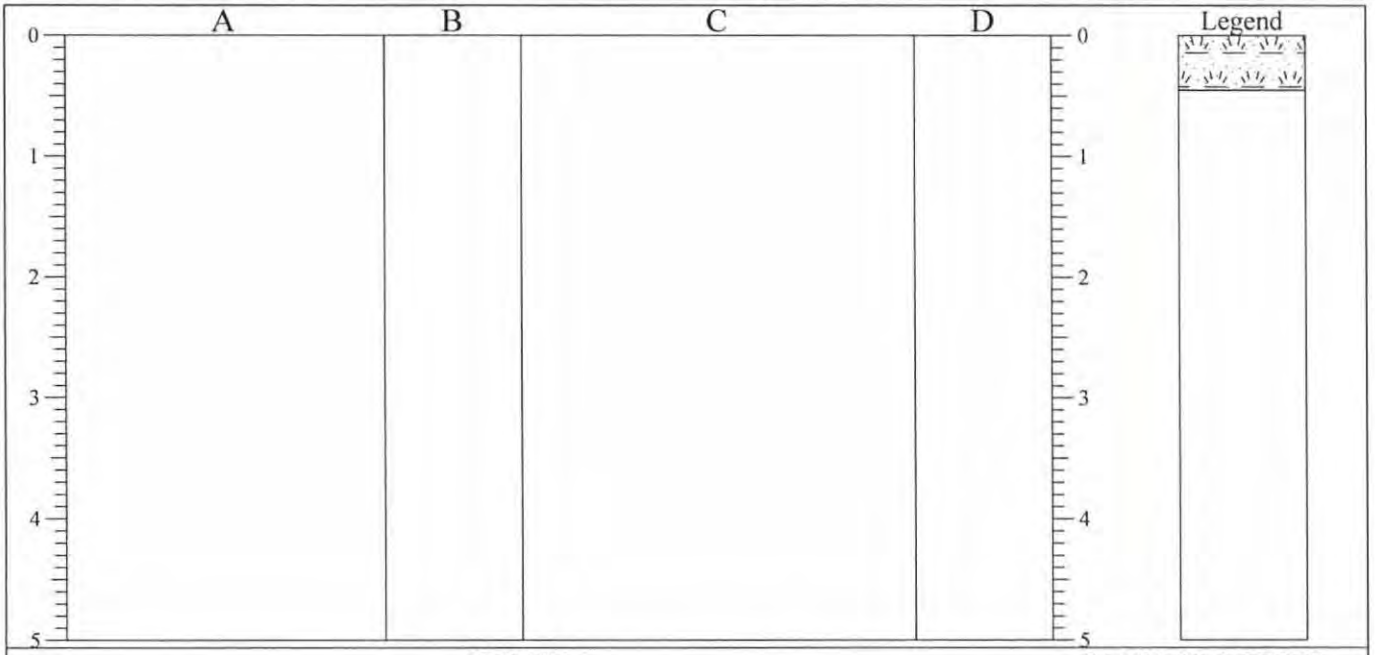
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 967
Job No	Date 02-11-06 02-11-06	Ground Level (m) 16.32	Co-Ordinates () E 129,250.5 N 228,158.8	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

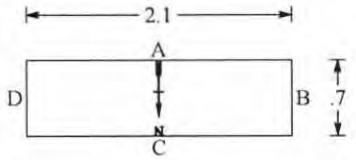


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.45		Soft damp brown slightly sandy gravelly SILT/CLAY with many subangular to rounded cobbles and some boulders of limestone (TOPSOIL) . Boulders up to 400mm long.			0.10	J	
0.45		Refusal - possible intact rock or large boulders (grey subangular to angular boulder size limestone fragments up to 800mm long).					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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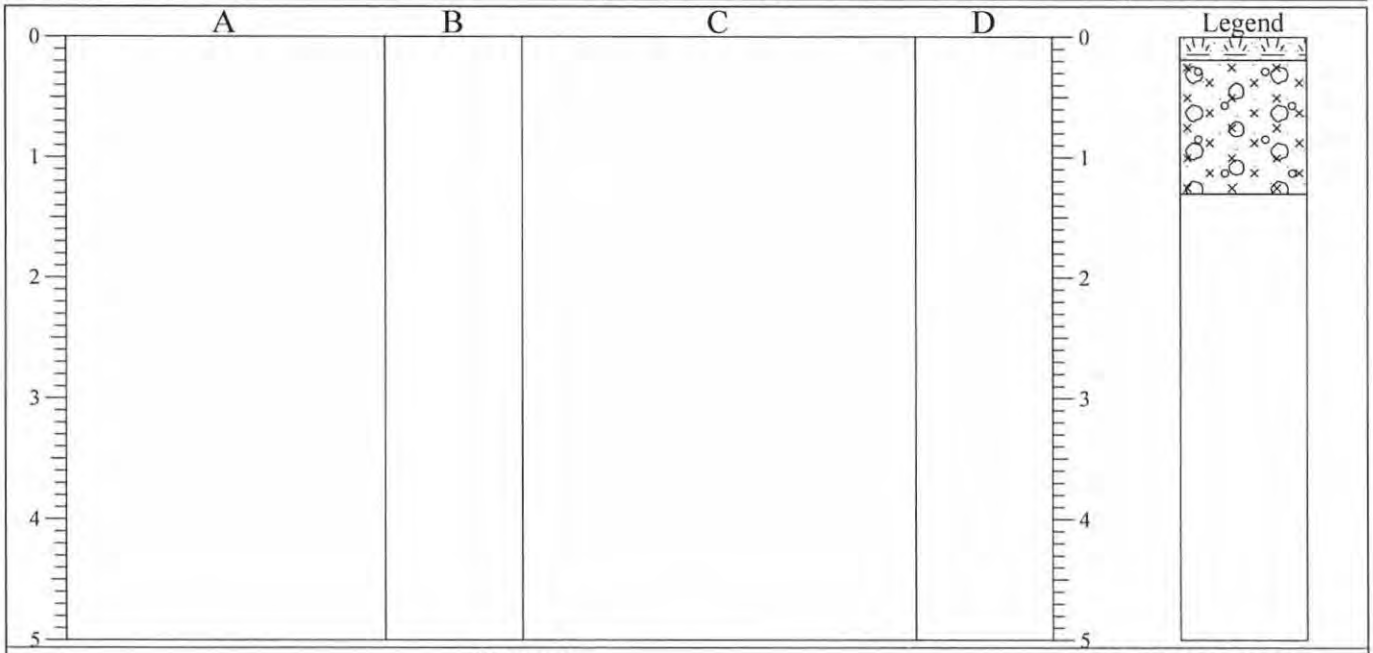
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 969
Job No	Date 24-10-06 / 24-10-06	Ground Level (m) 8.72	Co-Ordinates () E 129,337.4 N 228,252.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.45m 2nd: 3rd:	Rose to (@ 20 min.): 0.10m	Sheet 1 of 1

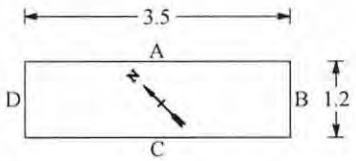


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.19 0.19-1.30		Soft damp brown slightly sandy gravelly SILT/CLAY with some subangular to subrounded cobbles (TOPSOIL). Stiff damp grey brown mottled orange slightly sandy slightly gravelly SILT with some subangular to subrounded cobbles and boulders.Boulders up to 1000mm long. 0.50 grey mottled brown,with many subangular to angular cobbles and boulders.Boulders up to 1000mm long.		1	0.10 0.45 0.70 0.70	J W B J	
1.30		Refusal - possible intact rock (fractured dark grey limestone).					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation-spalling of sides from 1.20m.Water strike at 0.45m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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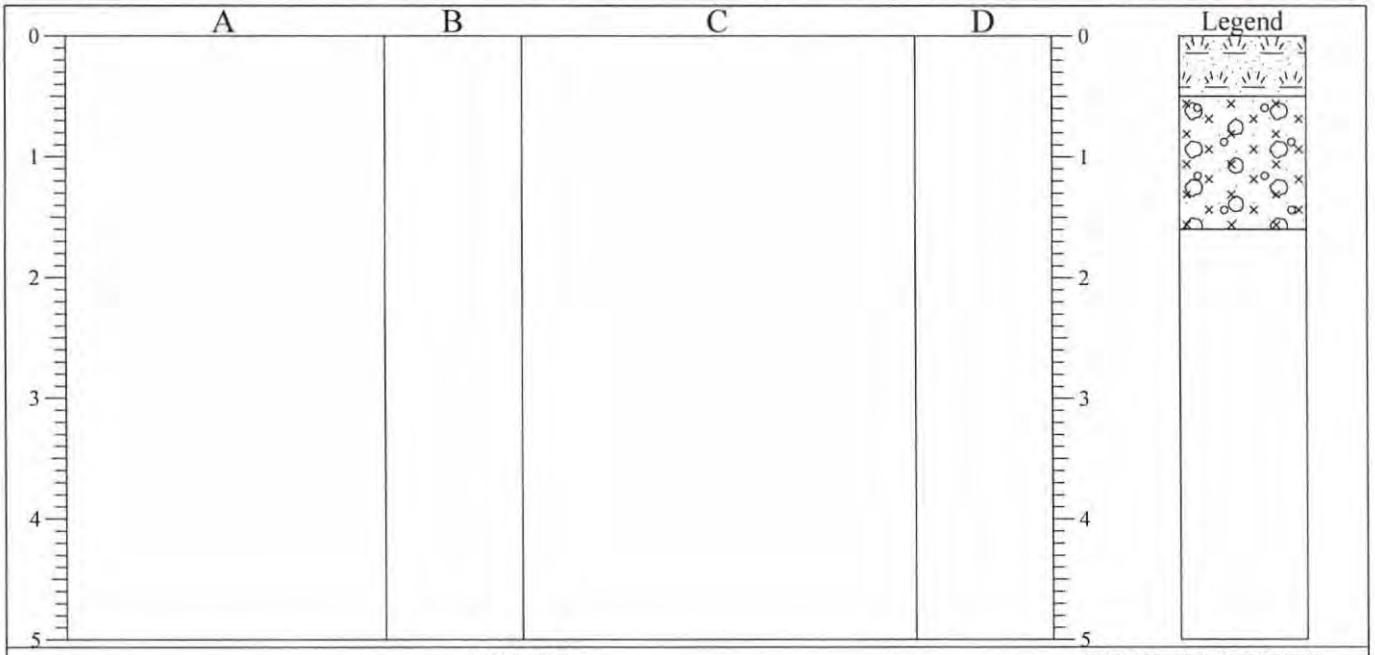
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 971
Job No	Date 20-10-06 20-10-06	Ground Level (m) 16.41	Co-Ordinates () E 129,416.2 N 228,288.1	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

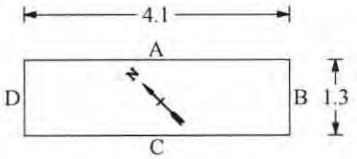


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.50		Soft damp brown grey mottled orange slightly sandy gravelly SILT/CLAY with some subangular to subrounded cobbles and boulders (TOPSOIL).Boulders up to 300mm long.			0.30	J	
0.50-1.60		Soft damp grey brown mottled slightly sandy gravelly SILT with many subangular to subrounded cobbles and subangular to angular boulders.Boulders up to 450mm long.			1.00 1.00	B J	
1.60		Refusal - possible intact rock (fractured dark grey limestone).					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, unstable during excavation-spalling of sides from 0.30m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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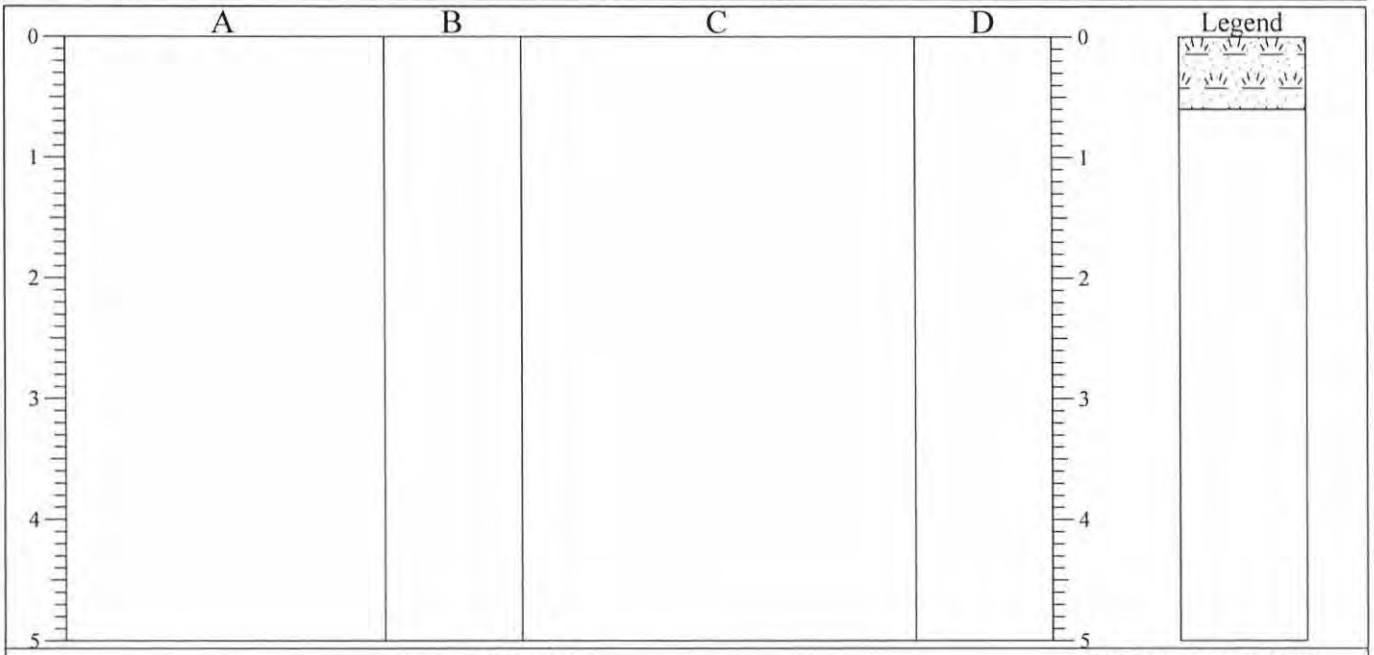
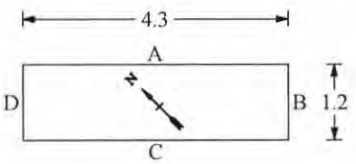
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 978
Job No	Date 17-10-06 / 17-10-06	Ground Level (m) 14.44	Co-Ordinates () E 129,684.5 N 228,408.8	
Contractor: IDL	GROUNDWATER STRIKES — Water strikes: 1st: dry; 2nd:; 3rd: — Rose to (@ 20 min.): — Sealed at:			Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Soft damp brown slightly sandy gravelly SILT/CLAY with roots and many subangular to angular cobbles and boulders (TOPSOIL).Boulders up to 600mm long.			0.40	B	
0.60		Refusal - possible intact rock (fractured grey limestone).			0.40	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB1.GPJ AGS 3_1.GDT 30/01/07

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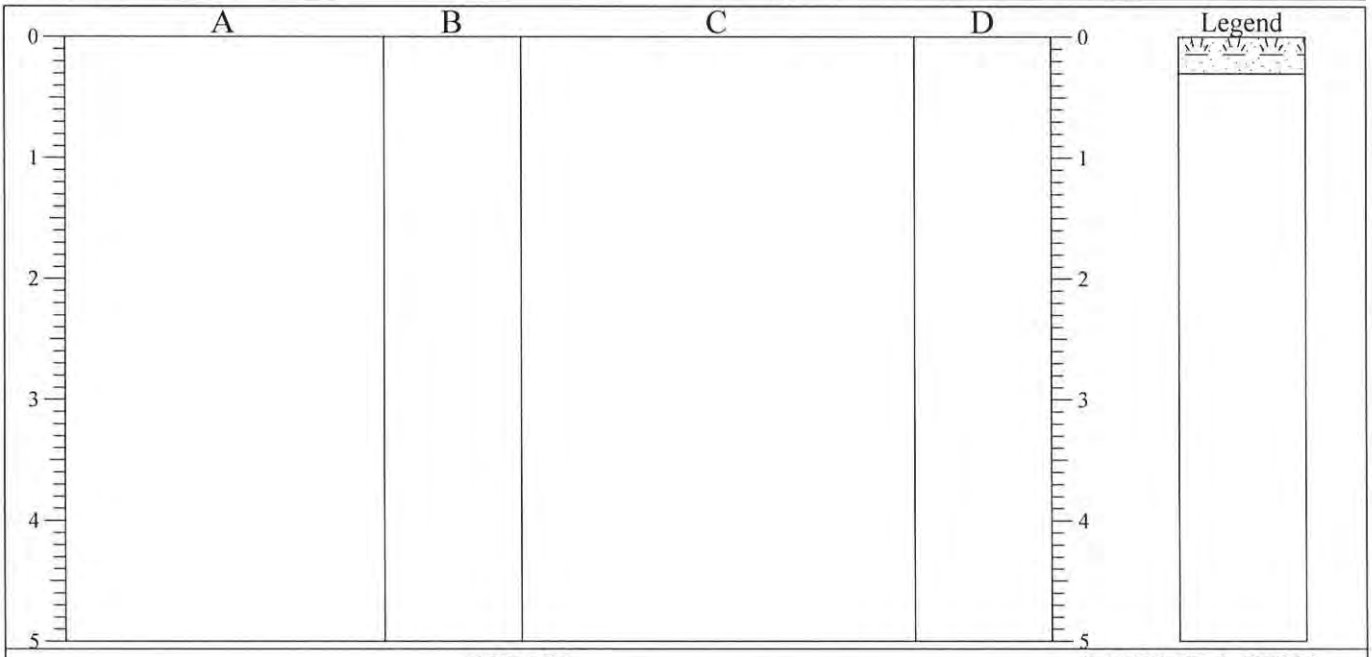
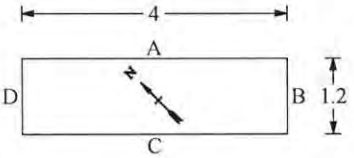
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 980
Job No	Date 17-10-06 / 17-10-06	Ground Level (m) 33.29	Co-Ordinates () E 129,838.1 N 228,649.1	
Contractor: IDL	GROUNDWATER STRIKES — Water strikes: 1st: dry; 2nd:; 3rd: — Rose to (@ 20 min.): — Sealed at:			Sheet: 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft damp brown slightly sandy very gravelly SILT/CLAY with roots and many subangular to angular and flat cobbles and boulders.Boulders up to 500mm long (TOPSOIL).			0.15	J	
0.30		Refusal - intact rock (grey limestone).					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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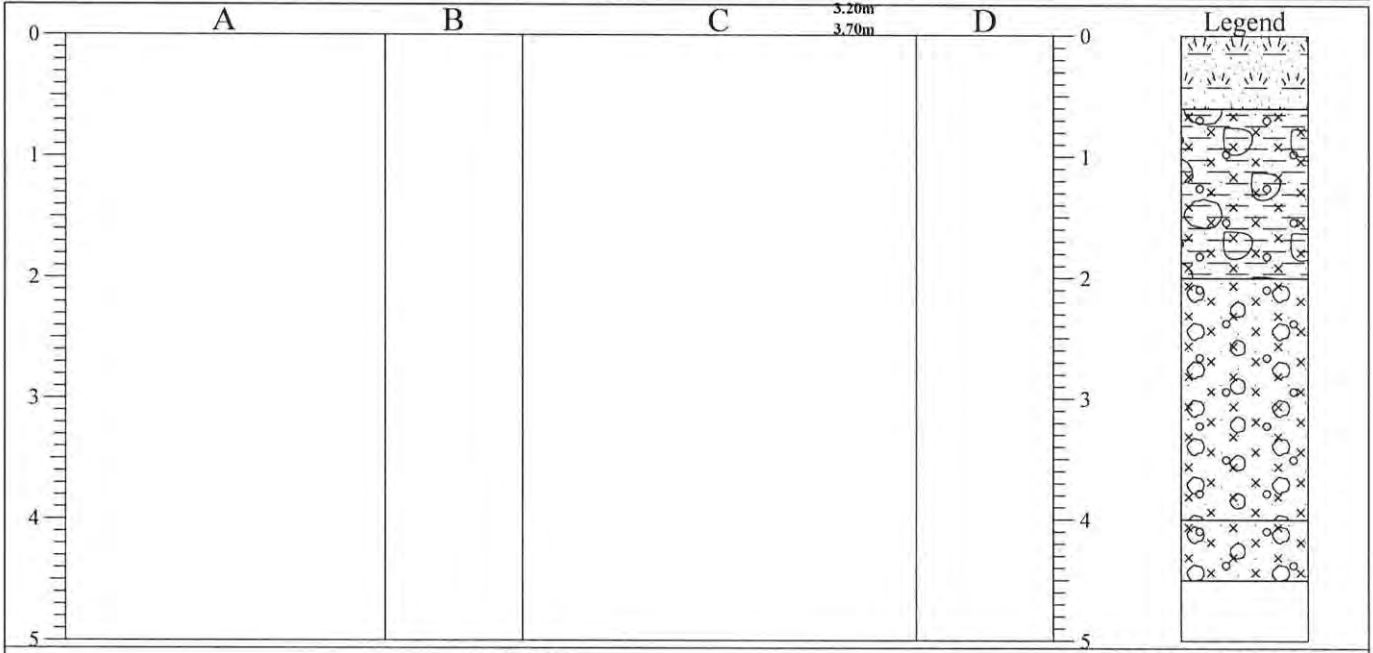
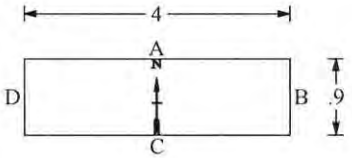
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1111
Job No	Date 22-09-06 22-09-06	Ground Level (m) 9.55	Co-Ordinates () E 131,195.0 N 228,845.9	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.20m 2nd: 0.50m 3rd: 2.50m 3.20m 3.70m	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Firm dark brown slightly sandy gravelly SILT with roots and some rounded to subrounded cobbles (TOPSOIL).		1 2	0.15	J	
0.60-2.00		Soft grey and mottled yellow brown slightly sandy gravelly SILT/CLAY with many subangular to rounded cobbles.			1.00 1.00	B J	
2.00-4.00		Soft grey slightly sandy gravelly SILT with many subangular to rounded cobbles and some boulders. Boulders up to 300mm long.		3 4 5	2.00 2.00 3.00 3.00	B J B J	
4.00-4.50		Soft brownish grey sandy gravelly SILT with many subangular to rounded cobbles and some boulders. Boulders up to 400mm long.			4.00 4.00	B J	
4.50		Pit terminated.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Spalling of sides from 1.20m.Water ingress from 0.2 to 3.7m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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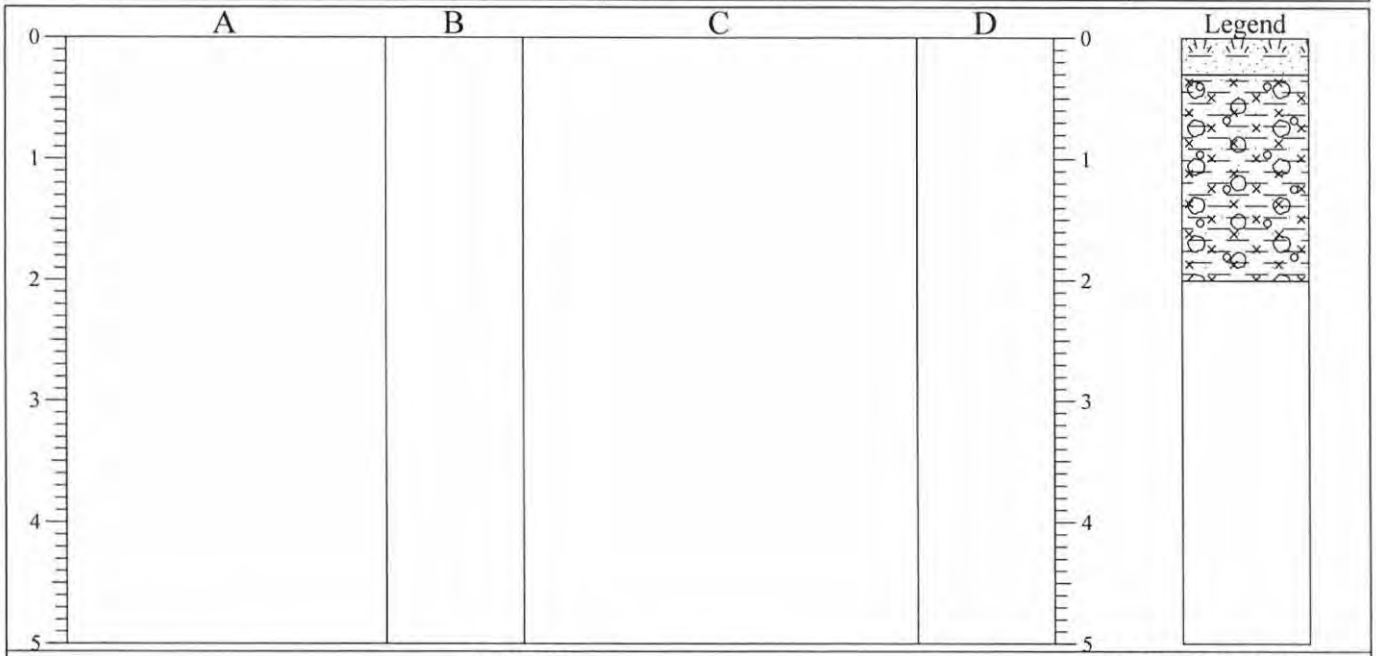
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1132
Job No	Date 02-11-06 02-11-06	Ground Level (m) 11.88	Co-Ordinates () E 131,169.7 N 228,723.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

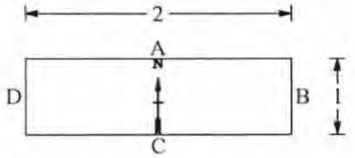


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		TOPSOIL - brown sandy clay.					
0.30-2.00		Firm grey brown slightly sandy slightly gravelly SILT/CLAY with many subrounded to rounded cobbles and some boulders of limestone.Boulders up to 400m long.Gravel is coarse,subrounded to subangular.			1.00	B	
2.00		Refusal - possible rock or boulders.			2.00	B	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, unstable during excavation-spalling of sides.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

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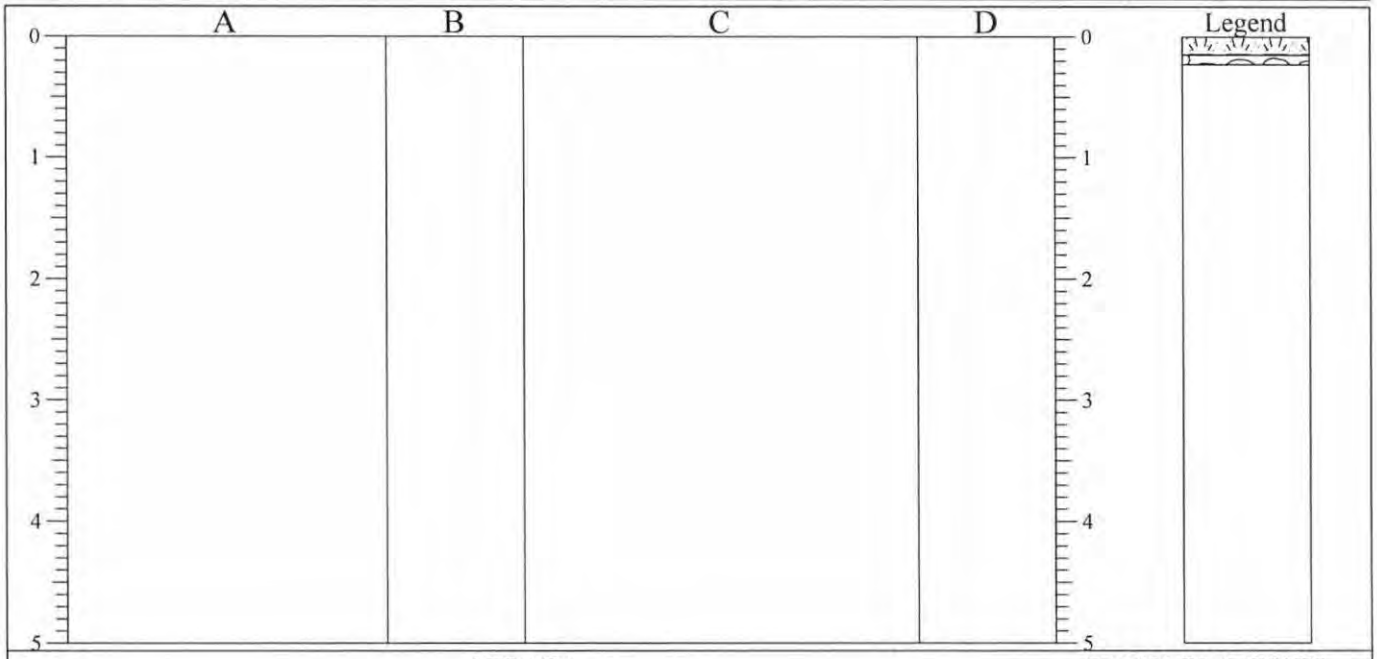
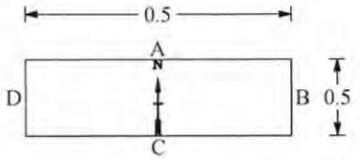
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1400
Job No	Date 12-10-06 12-10-06	Ground Level (m) 9.31	Co-Ordinates () E 121,140.7 N 222,532.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA					SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.15 0.15-0.23 0.23		Soft wet dark brown slightly sandy silty/clayey TOPSOIL with many roots and rootlets. Large subangular and subrounded light brown speckled grey and white granite BOULDERS. TP abandoned at 0.23m bgl obstruction - probable rock.			0.00-0.23	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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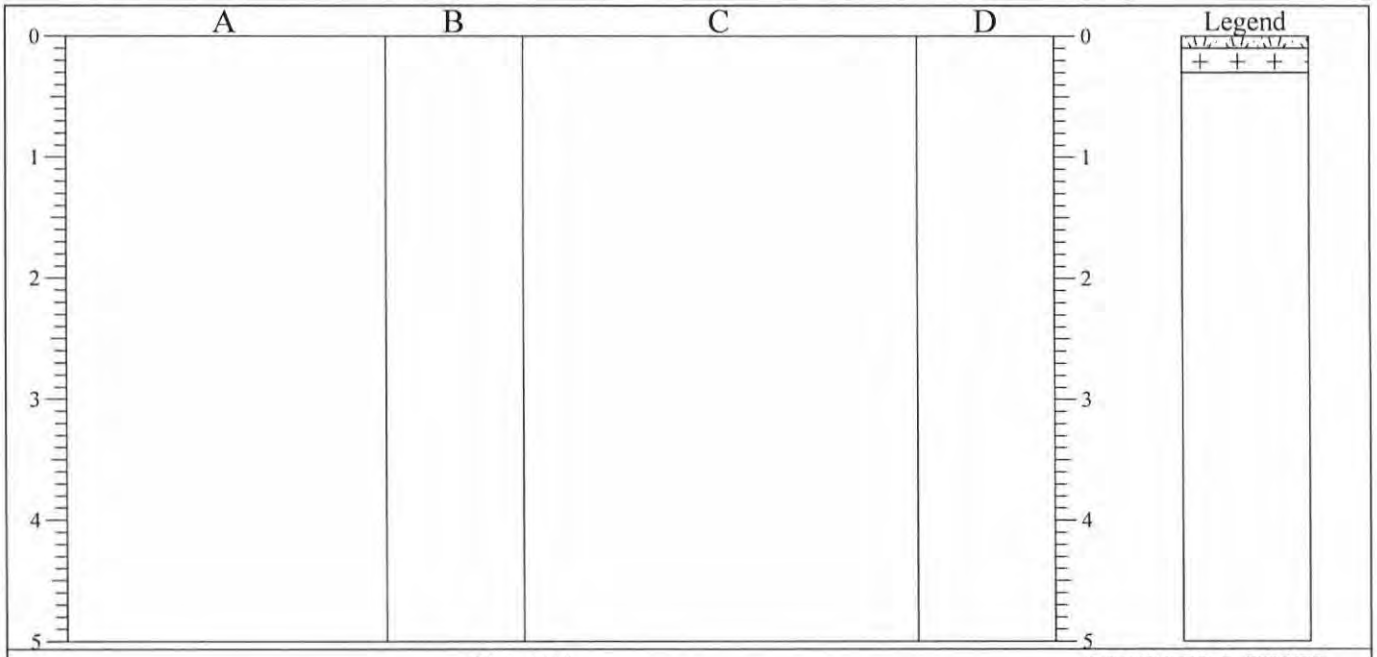
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1401
Job No	Date 11-10-06 11-10-06	Ground Level (m) 12.31	Co-Ordinates () E 121,320.8 N 222,578.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

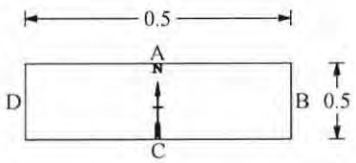


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Soft damp brown slightly sandy gravelly silty/clayey TOPSOIL with some subangular and angular cobbles with many roots and rootlets.			0.00-0.15	J	
0.10-0.30		Broken rock at 0.1m bgl. Recovered as grey speckled white and pink GRANITE.					
0.30		TP abandoned at 0.3m bgl obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

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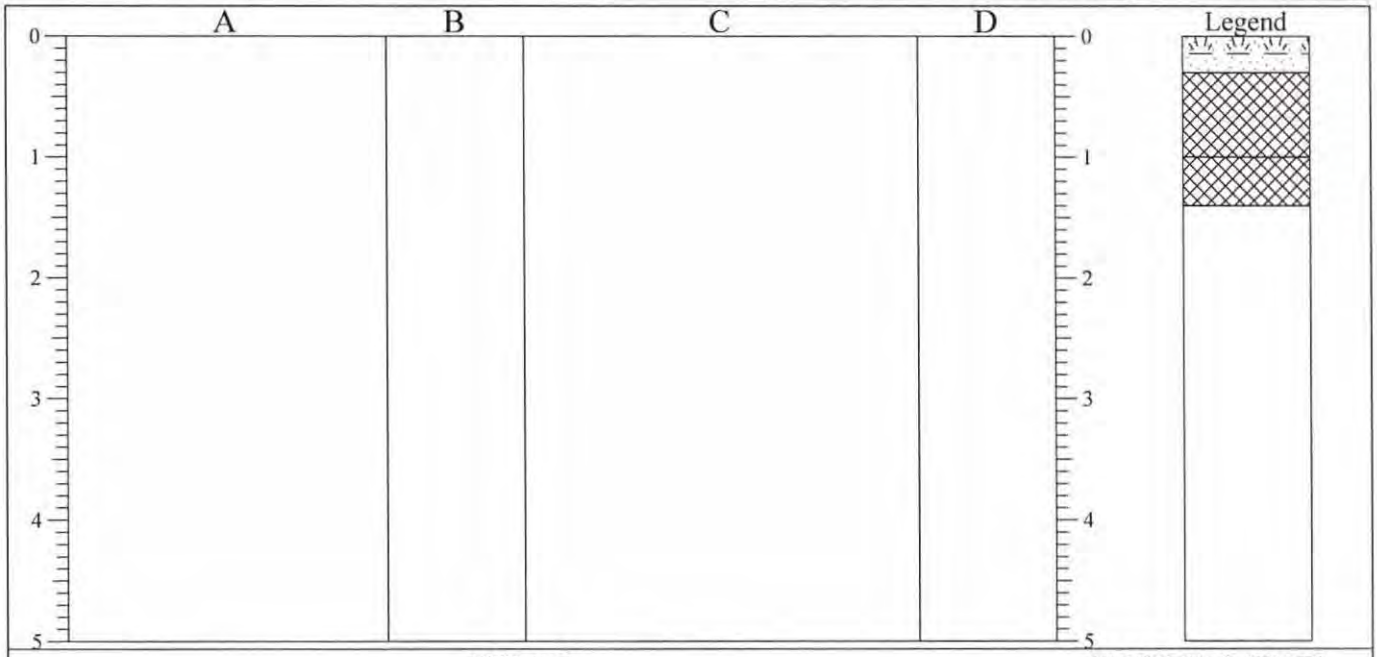
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1402
Job No	Date 16-10-06 16-10-06	Ground Level (m) 29.15	Co-Ordinates () E 121,295.5 N 223,019.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

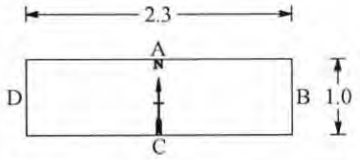


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft damp TOPSOIL with many roots and rootlets.					
0.30-1.00		MADE GROUND: Dark brown gravelly sandy SILT with many angular to rounded cobbles and some angular to subrounded with boulders. Boulders are up to 500mm in size.			0.20-0.75	J	
					0.75-1.40	B	
1.00-1.40		MADE GROUND: Damp light brown mottled orange and dark brown gravelly very silty SAND with many angular to subrounded cobbles and boulders. Boulders are up to 1500mm in size.			0.75-1.40	D	
					0.75-1.40	J	
1.40		TP abandoned at 1.4m bgl obstruction.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

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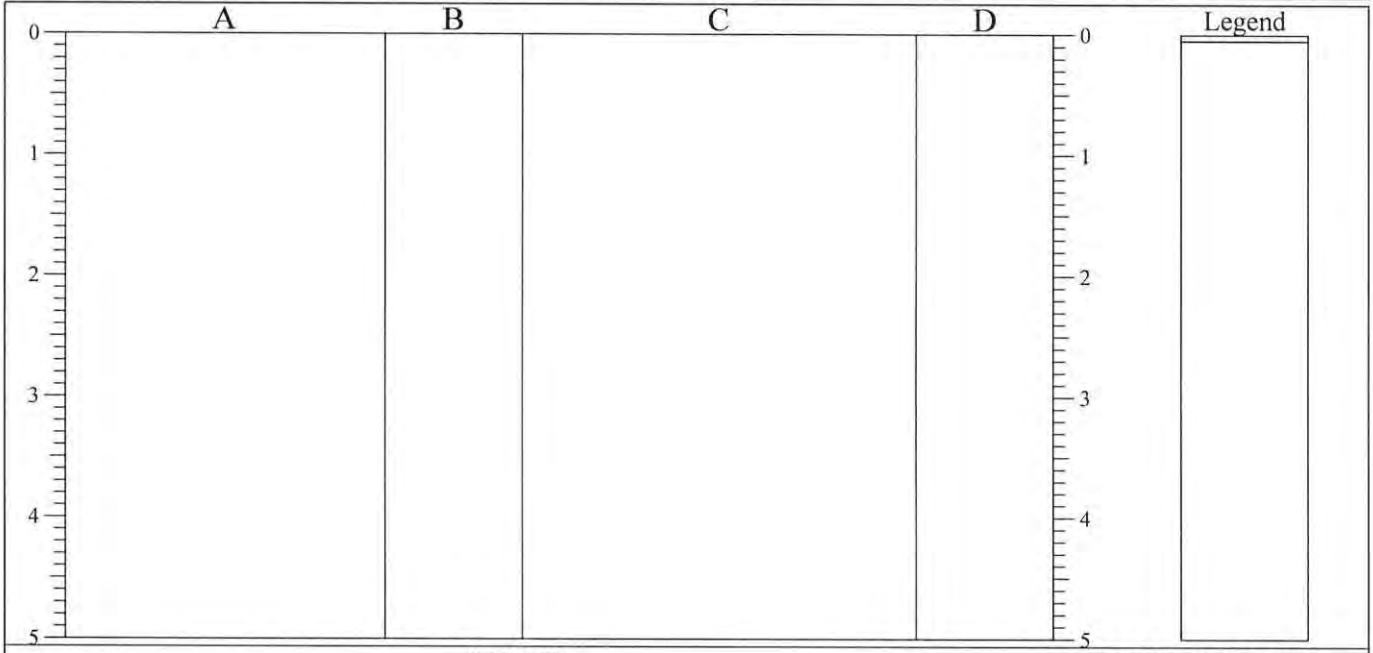
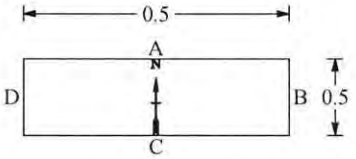
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1403
Job No	Date 12-10-06 12-10-06	Ground Level (m) 37.46	Co-Ordinates () E 121,237.8 N 223,265.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA				SAMPLES & TESTS				
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.05 0.05		Rock at surface as brown speckled grey and white GRANITE. TP abandoned at 0.05m bgl obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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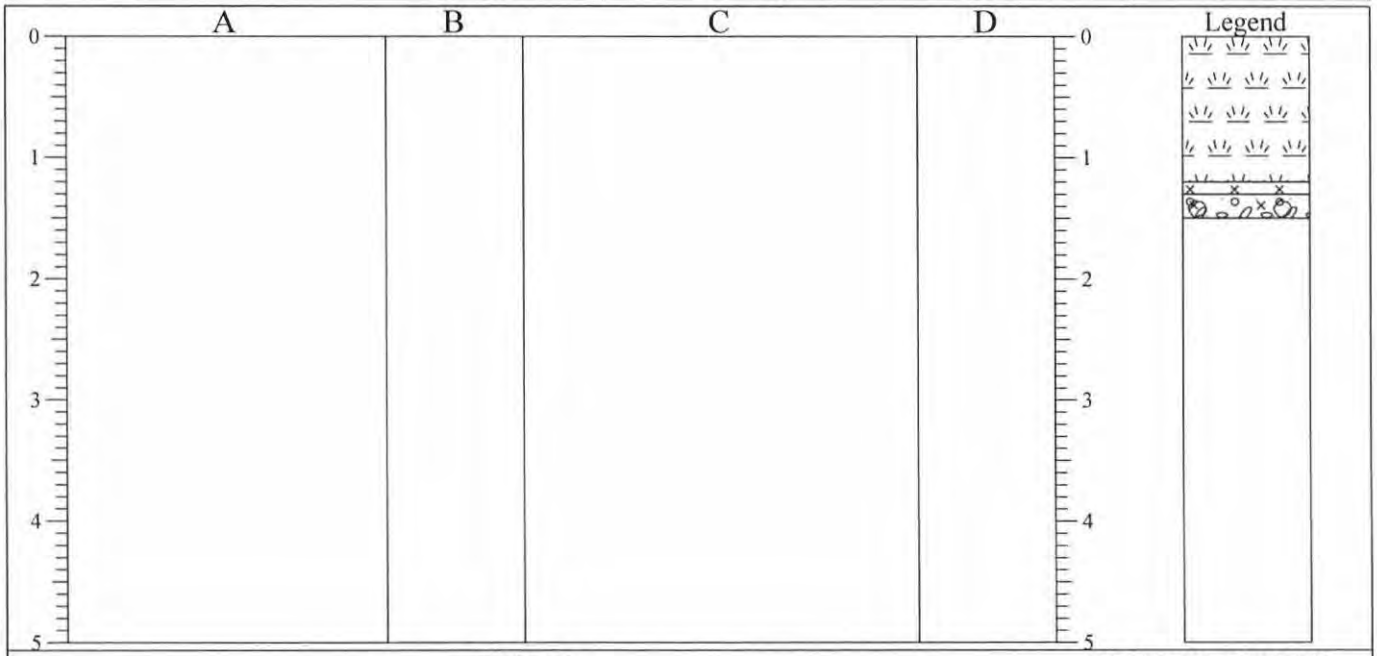
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1430
Job No	Date 10-10-06 10-10-06	Ground Level (m) 6.25	Co-Ordinates () E 127,560.1 N 228,410.1	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.00m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

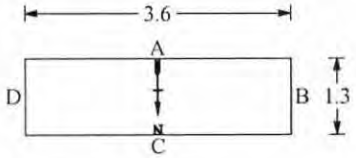


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.20		Black fibrous PEAT. H3/H4, W3.			0.50-1.00	J	
1.20-1.30		Very soft creamy grey calcareous SILT.					
1.30-1.50		Blue grey silty sandy GRAVEL with some angular to subangular cobbles and boulders. Gravel is angular to subangular and fine to medium grained.			1.30-1.50	B	
1.50		TP abandoned at 1.5m bgl. Obstruction - probable rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation. Inflow to TP from surface.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By MM

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

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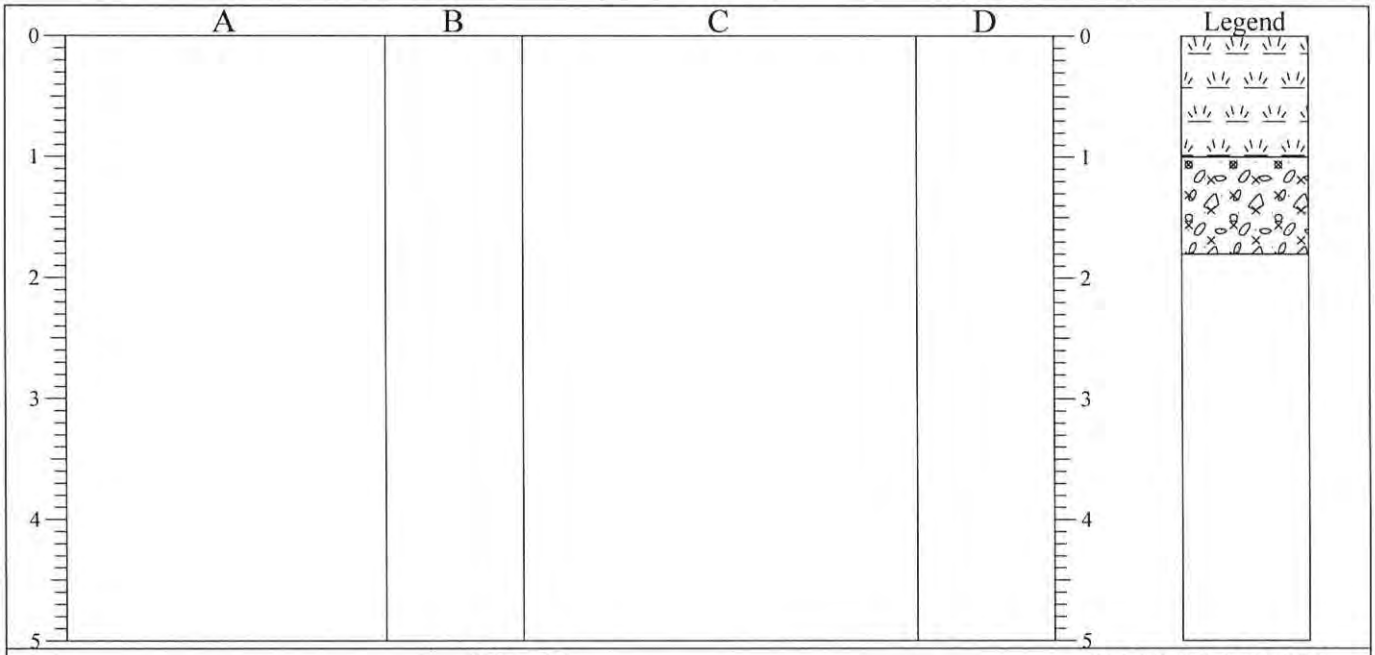
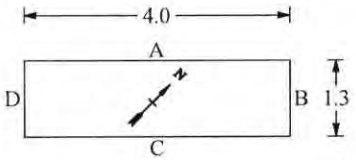
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1431
Job No	Date 10-10-06 10-10-06	Ground Level (m) 6.42	Co-Ordinates () E 127,703.7 N 228,341.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.30m 2nd: 3rd:	Rose to (@ 20 min.): 0.40m	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.00		Grass over black PEAT. H3/H4, W2.		1	0.30 0.50-1.00	W J	
1.00-1.80		Blue grey silty very sandy GRAVEL. Gravel is rounded to subangular and fine to medium grained.			1.00-1.50	B	
1.80		TP abandoned at 1.8m bgl. Obstruction - probable rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Moderate ingress of water from 0.3m bgl. Pit stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By MM

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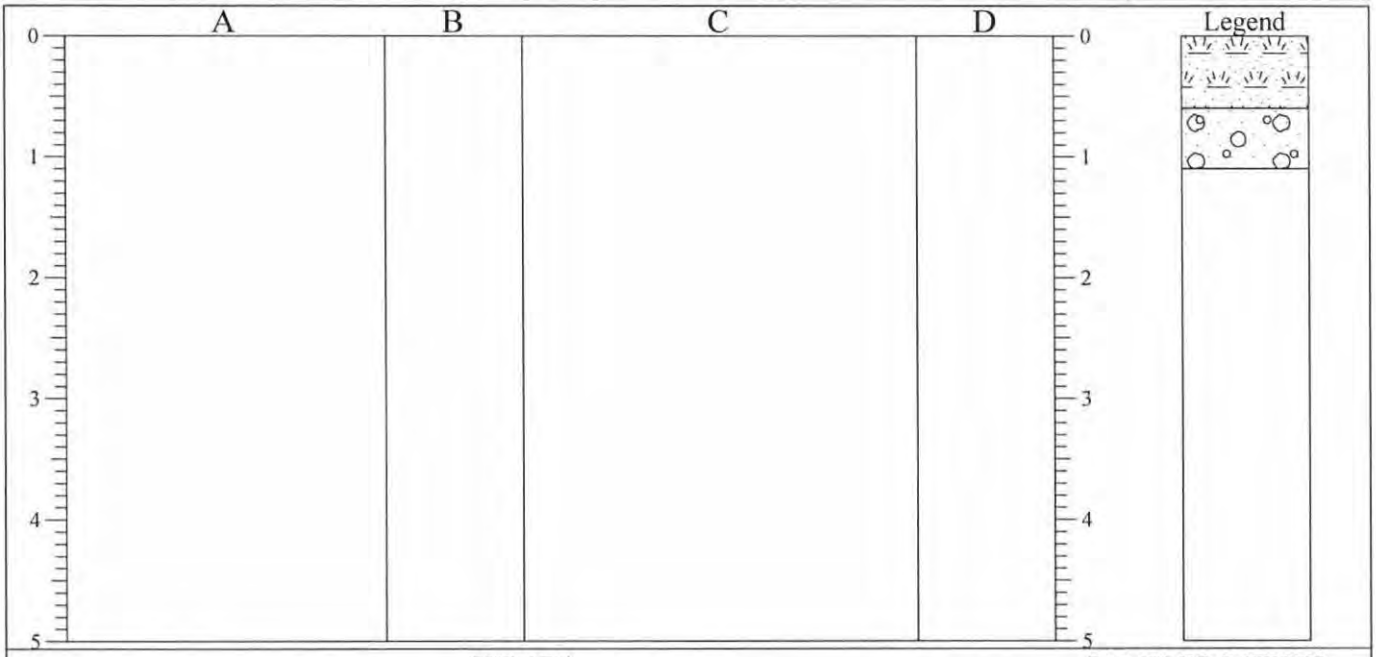
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1432
Job No	Date 26-09-06 26-09-06	Ground Level (m) 16.97	Co-Ordinates () E 128,656.6 N 227,986.4	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd: Rose to (@ 20 min.): Sealed at:			Sheet 1 of 1

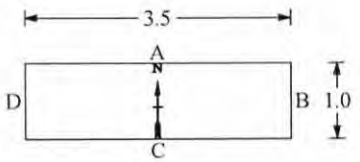


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Brown sandy clayey TOPSOIL.					
0.60-1.10		Grey SAND & GRAVEL limestone cobbles and boulders. Cobbles and boulders are subrounded to subangular. Boulders are 600-700mm in size. Gravel is subrounded to subangular and is coarse grained.			0.50-0.60	D	
1.10		TP abandoned at 1.1m bgl. Obstruction - probable limestone rock or boulders.			1.00-1.10 1.00-1.10	B D	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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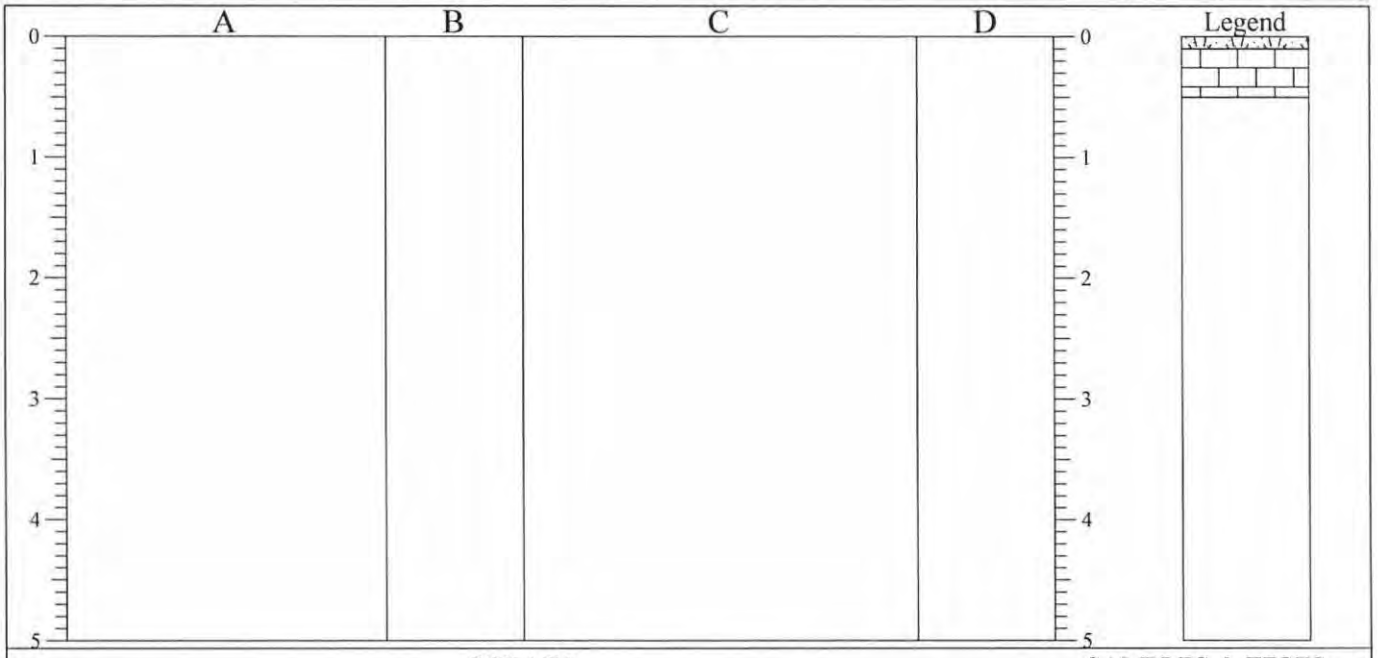
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1433
Job No	Date 27-09-06 27-09-06	Ground Level (m) 14.30	Co-Ordinates () E 128,755.9 N 228,065.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

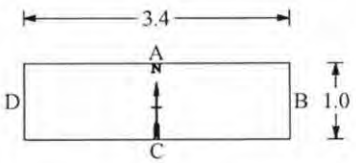


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		TOPSOIL.					
0.10-0.50		Possible rock. Recovered as clay band limestone cobbles and boulders. Cobbles and boulders are tabular to subangular. Boulders are 1500-2000mm in size. Becoming strong with depth.			0.40-0.50	D	
0.50		TP abandoned at 0.5m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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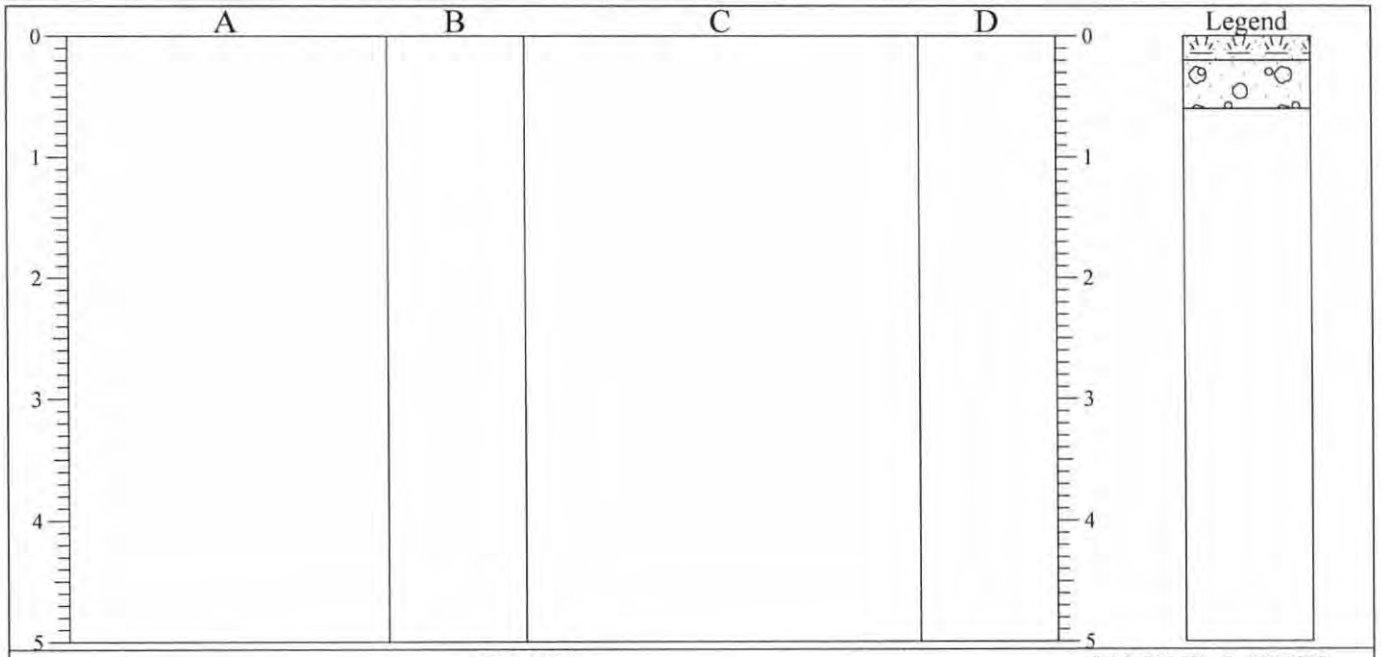
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1434
Job No	Date 27-09-06 27-09-06	Ground Level (m) 16.13	Co-Ordinates () E 128,784.9 N 228,047.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

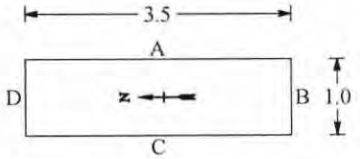


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		Brown sandy clayey TOPSOIL.					
0.20-0.60		Grey SAND & GRAVEL limestone cobbles and boulders. Cobbles and boulders are rounded to subrounded. Boulders are 600-700mm in size. Gravel is subrounded to subangular and is coarse grained.					
0.60		TP abandoned at 0.6m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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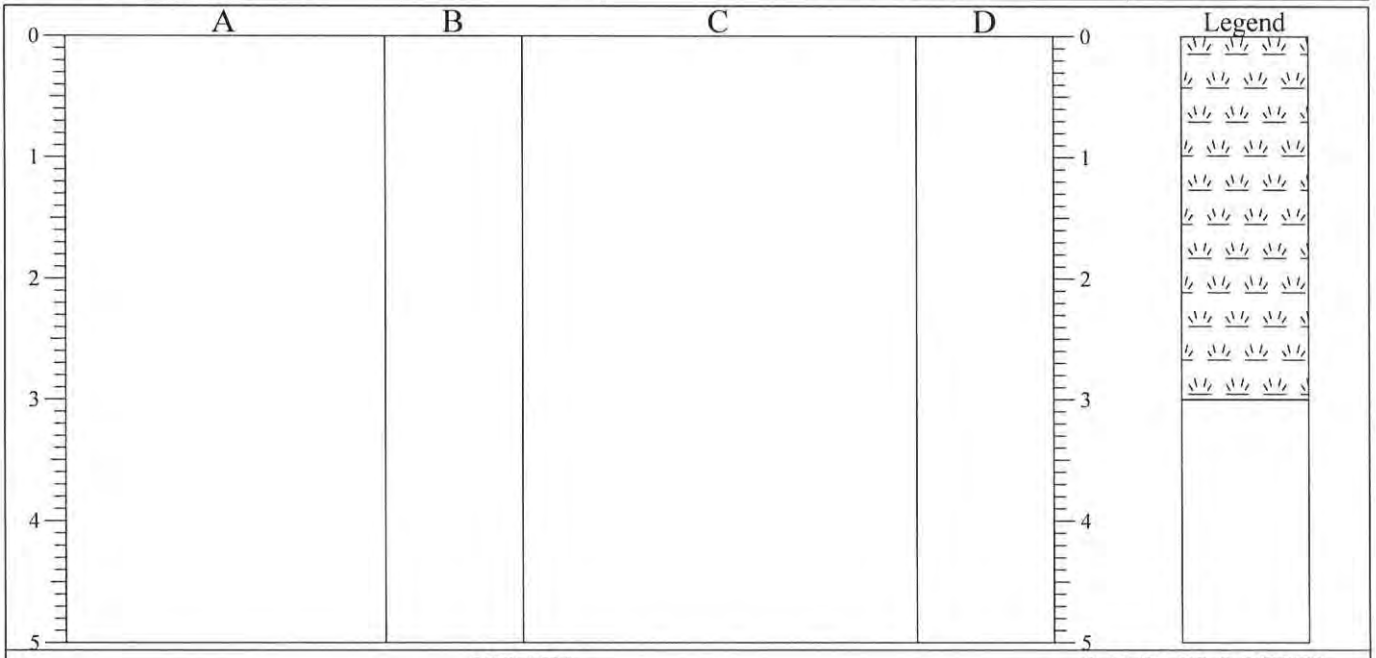
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1435
Job No	Date 14-11-06 14-11-06	Ground Level (m) 6.24	Co-Ordinates () E 129,001.7 N 227,958.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 2.50m 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

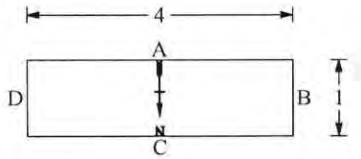


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-3.00		Soft light brown fibrous PEAT with many rootlets.			1.00	B	
					1.00	J	
					2.00	B	
				1	2.00	J	
3.00		Pit abandoned - constant collapse of pit sides.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Collapsing of sides.Water seepage at 2.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

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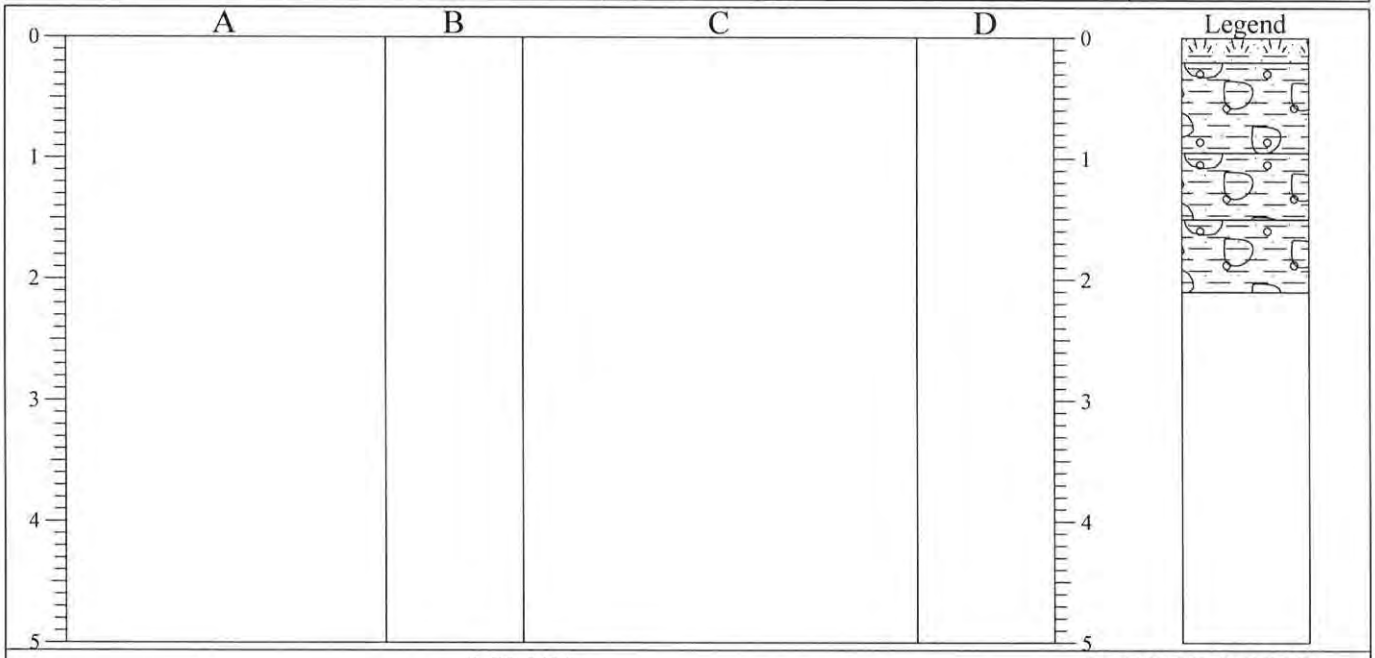
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1436
Job No	Date 25-10-06 25-10-06	Ground Level (m) 19.32	Co-Ordinates () E 129,155.4 N 228,113.8	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:	Sheet 1 of 1

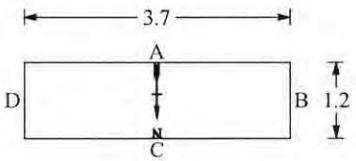


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		TOPSOIL with many roots and rootlets.			0.00-0.48	J	
0.20-0.95		Firm damp brown slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subrounded to subangular boulders. Boulders are up to 290mm in size.			0.48-1.00	B	
					0.48-1.00	D	
					0.48-1.00	J	
0.95-1.50		Firm damp grey mottled brown and orange slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subangular to angular boulders. Boulders are up to 300mm in size.			1.00-2.10	D	
					1.00-2.10	J	
1.50-2.10		Stiff damp grey mottled brown and orange slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subangular to angular boulders. Boulders are up to 400mm in size.			1.50-2.10	B	
2.10		TP abandoned at 2.1m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable between 0.6m and 1.2m bgl. Pit dry during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

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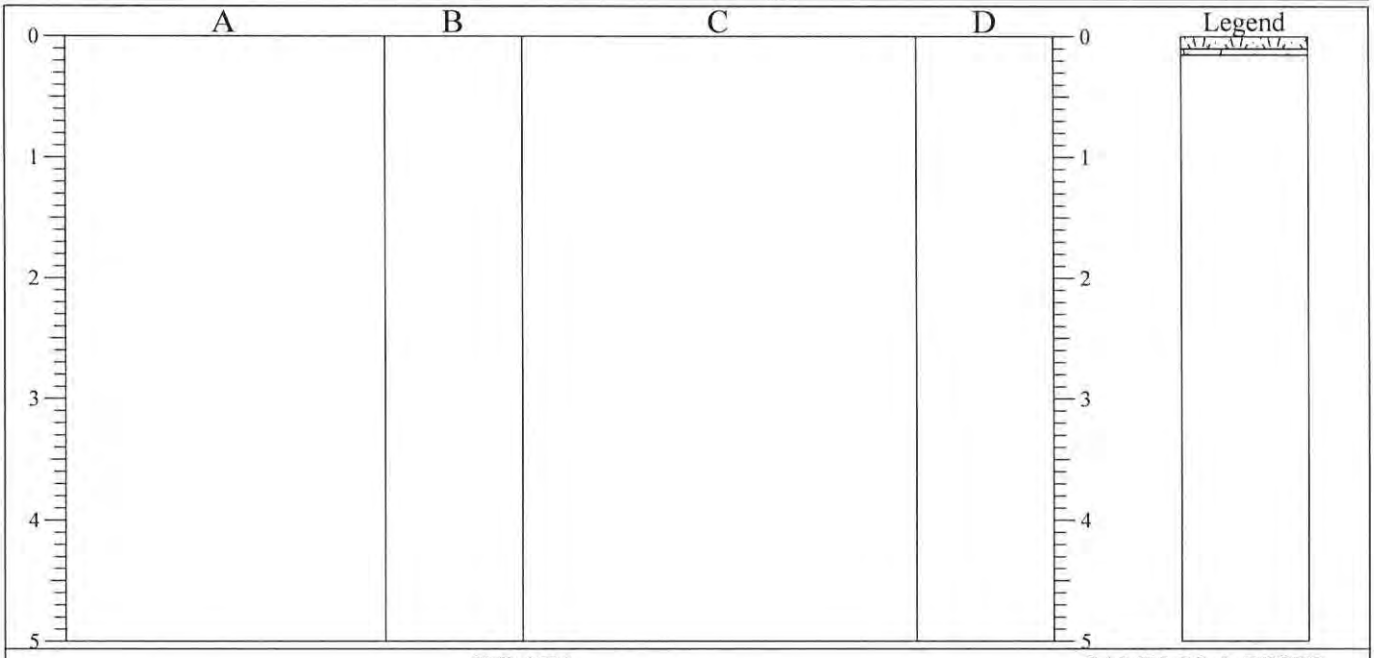
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1437
Job No	Date 25-10-06 25-10-06	Ground Level (m) 15.24	Co-Ordinates () E 129,309.4 N 228,203.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

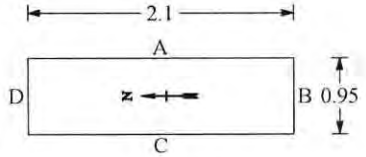


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		TOPSOIL with many roots and rootlets.			0.00-0.15	J	
0.10-0.15		Soft damp dark brown slightly sandy slightly gravelly SILT/CLAY with some angular to subrounded cobbles and rare subangular to angular boulders. Boulders are up to 300mm in size.					
0.15		TP abandoned at 0.15m bgl. Obstruction - probable limestone rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

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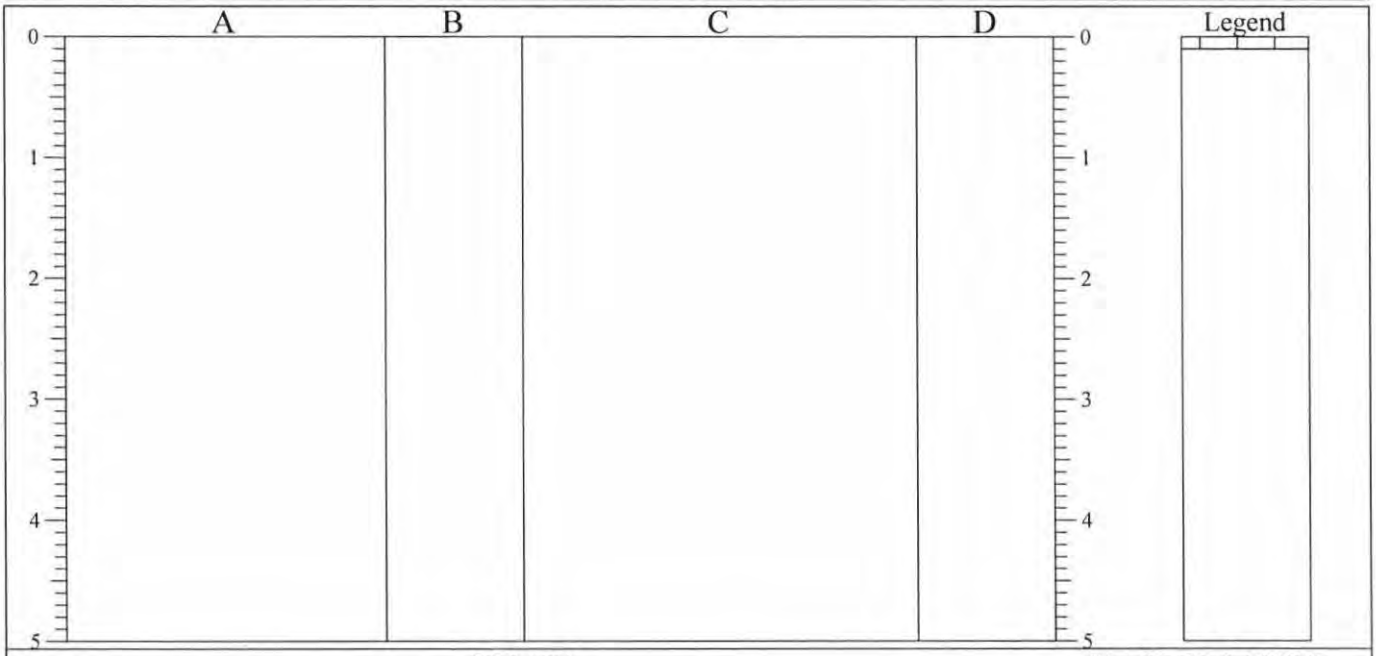
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1438
Job No	Date 26-10-06 26-10-06	Ground Level (m) 15.91	Co-Ordinates () E 129,428.7 N 228,258.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

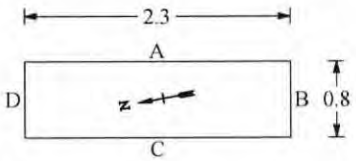


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Broken rock at surface as light grey LIMESTONE.			0.00-0.10	J	
0.10		TP abandoned at 0.1m bgl. Obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

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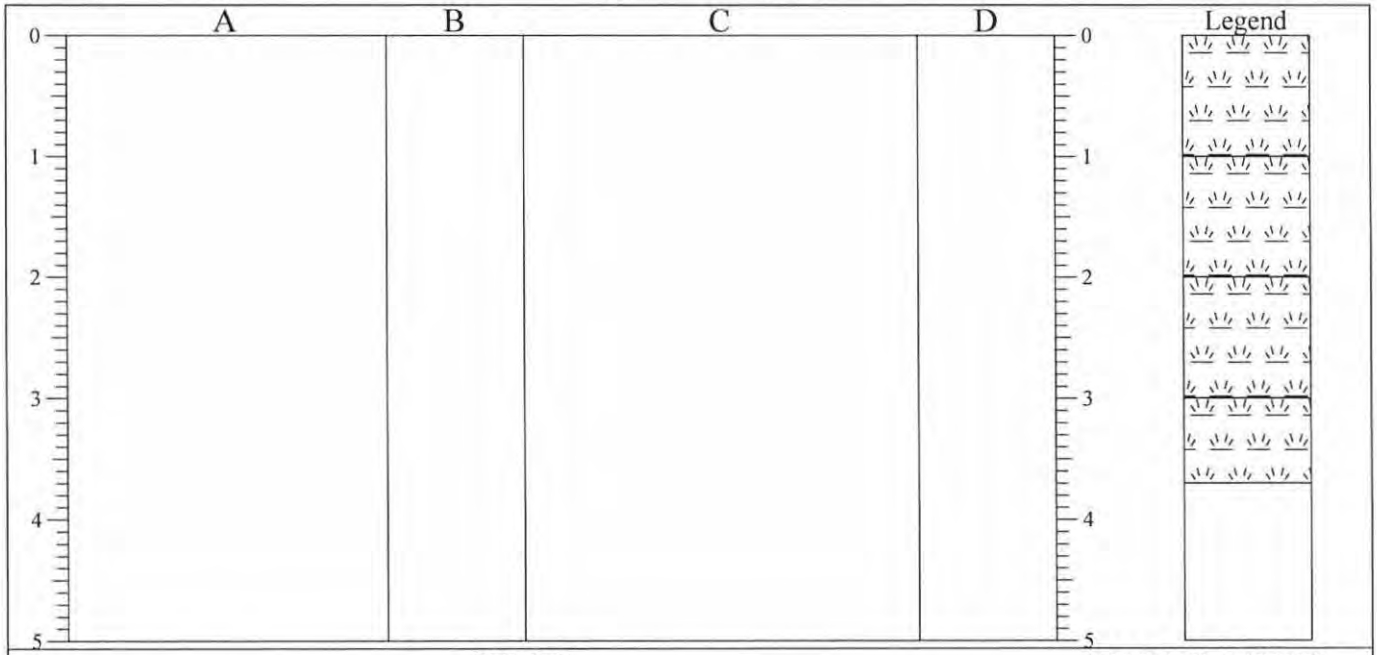
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1439
Job No	Date 04-12-06 04-12-06	Ground Level (m) 9.46	Co-Ordinates () E 131,254.0 N 228,790.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.00m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1



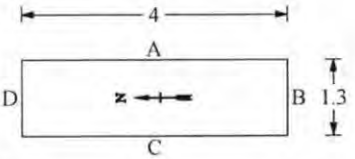
STRATA

Depth	No	DESCRIPTION	In Situ Tests	Water
0.00-1.00		Very soft dark brown PEAT (H3,B3,P0,W0,N0,TV2,TH2,A0,P0,F0).		
1.00-2.00		Very soft dark brown PEAT (H4,B3,F3,W1,N2,TV2,TH1,A1,P0).		
2.00-3.00		Very soft dark brown PEAT (H7,B3,F3,W1,N1,TV1,TH0,A1,P1,R1).		
3.00-3.70		Very soft dark brown PEAT (H8,B2,F3,W0,N1,TV0,TH0,A2,P1,R2) with traces of cream grey calcareous silt and and roots.		
3.70		Pit abandoned - constant collapse of pit sides and surface water ingress.		

SAMPLES & TESTS

Depth (m)	No	Remarks/Tests
0.70	B	
0.70	J	
1.70	B	
1.70	J	
2.50	B	
2.50	J	
3.10	B	
3.10	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Collapsing of sides from 1.20m depth.Very fast water ingress from surface.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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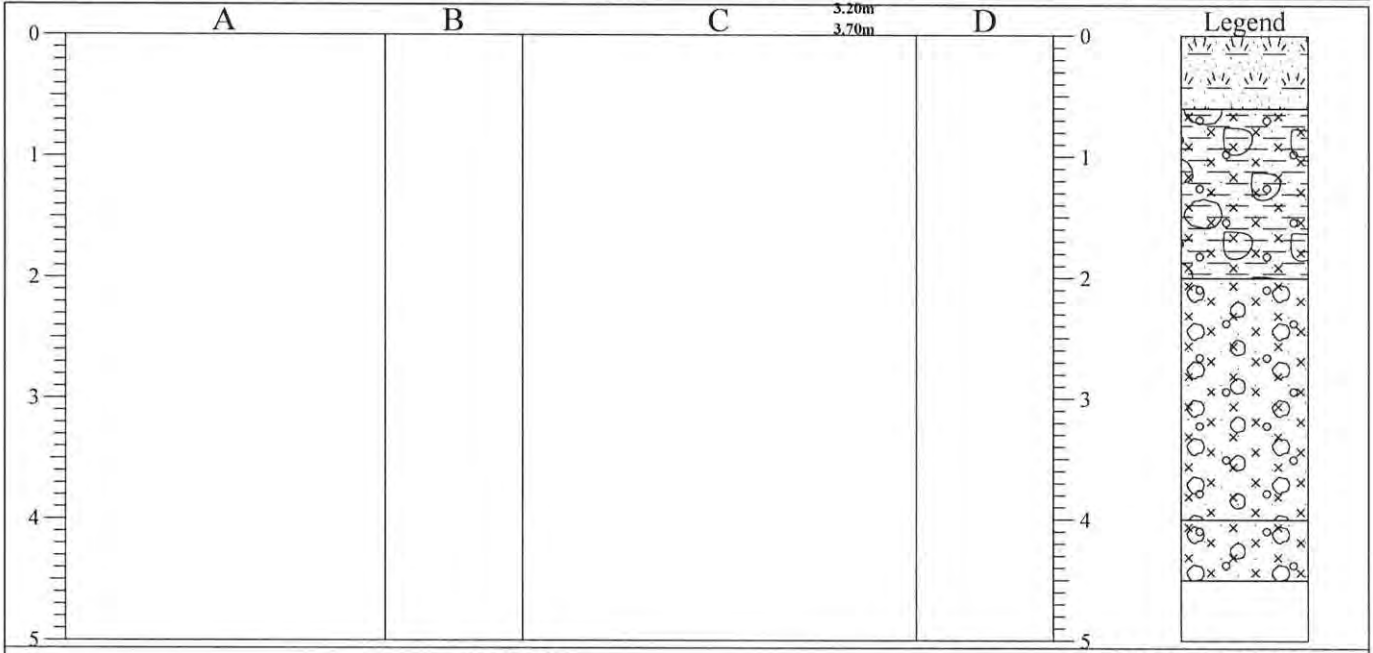
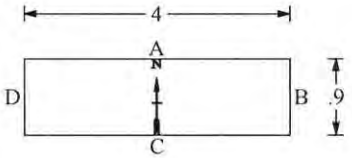
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1111
Job No	Date 22-09-06 22-09-06	Ground Level (m) 9.55	Co-Ordinates () E 131,195.0 N 228,845.9	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.20m 2nd: 0.50m 3rd: 2.50m 3.20m 3.70m	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Firm dark brown slightly sandy gravelly SILT with roots and some rounded to subrounded cobbles (TOPSOIL).		1 2	0.15	J	
0.60-2.00		Soft grey and mottled yellow brown slightly sandy gravelly SILT/CLAY with many subangular to rounded cobbles.			1.00 1.00	B J	
2.00-4.00		Soft grey slightly sandy gravelly SILT with many subangular to rounded cobbles and some boulders. Boulders up to 300mm long.		3 4 5	2.00 2.00 3.00 3.00	B J B J	
4.00-4.50		Soft brownish grey sandy gravelly SILT with many subangular to rounded cobbles and some boulders. Boulders up to 400mm long.			4.00 4.00	B J	
4.50		Pit terminated.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Spalling of sides from 1.20m.Water ingress from 0.2 to 3.7m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By TS

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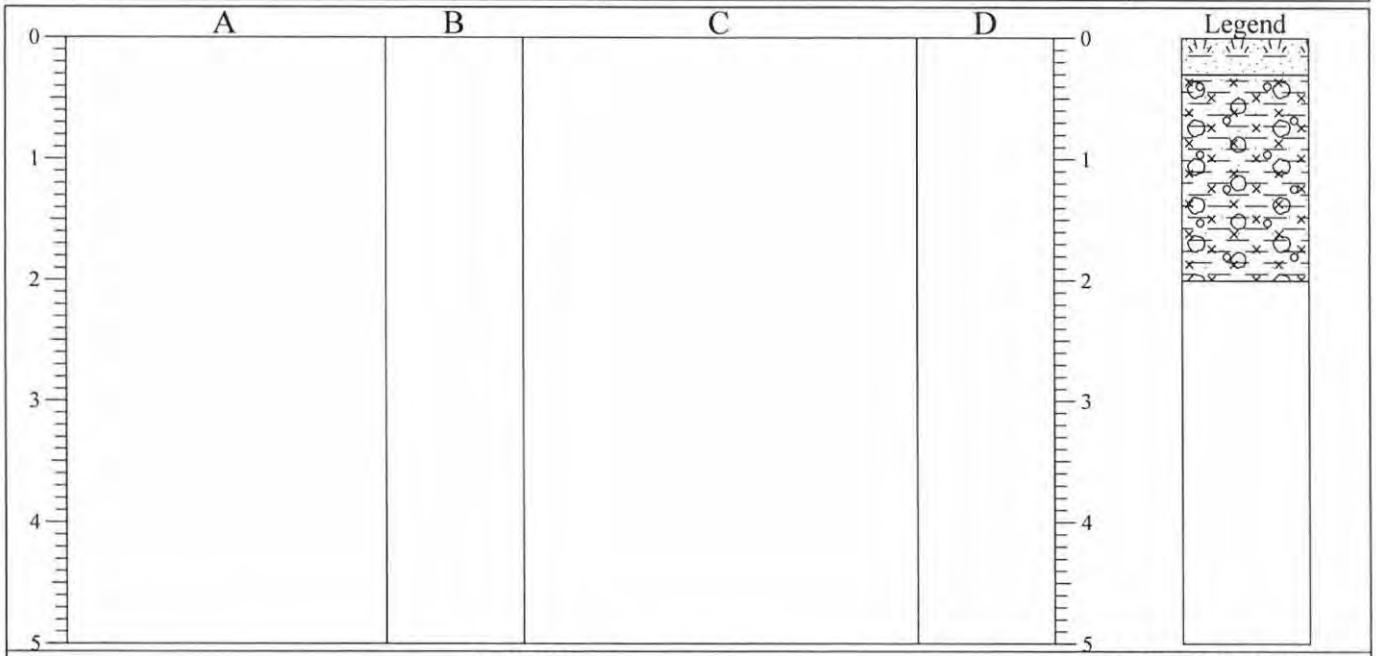
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1132
Job No	Date 02-11-06 02-11-06	Ground Level (m) 11.88	Co-Ordinates () E 131,169.7 N 228,723.6	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

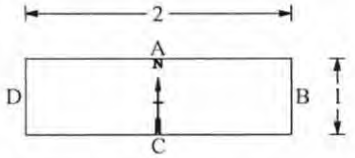


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		TOPSOIL - brown sandy clay.					
0.30-2.00		Firm grey brown slightly sandy slightly gravelly SILT/CLAY with many subrounded to rounded cobbles and some boulders of limestone.Boulders up to 400m long.Gravel is coarse,subrounded to subangular.			1.00	B	
2.00		Refusal - possible rock or boulders.			2.00	B	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, unstable during excavation-spalling of sides.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

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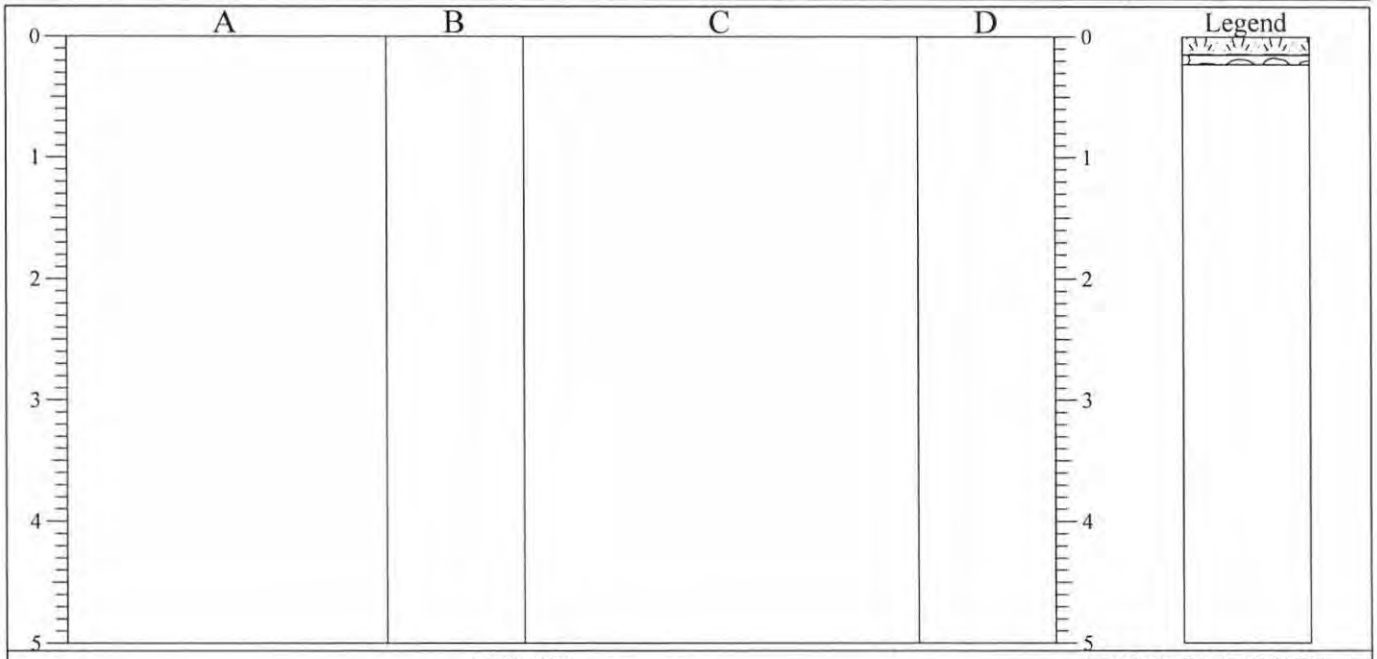
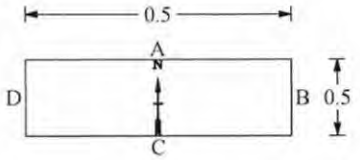
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1400
Job No	Date 12-10-06 12-10-06	Ground Level (m) 9.31	Co-Ordinates () E 121,140.7 N 222,532.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1



STRATA					SAMPLES & TESTS			
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.15 0.15-0.23 0.23		Soft wet dark brown slightly sandy silty/clayey TOPSOIL with many roots and rootlets. Large subangular and subrounded light brown speckled grey and white granite BOULDERS. TP abandoned at 0.23m bgl obstruction - probable rock.			0.00-0.23	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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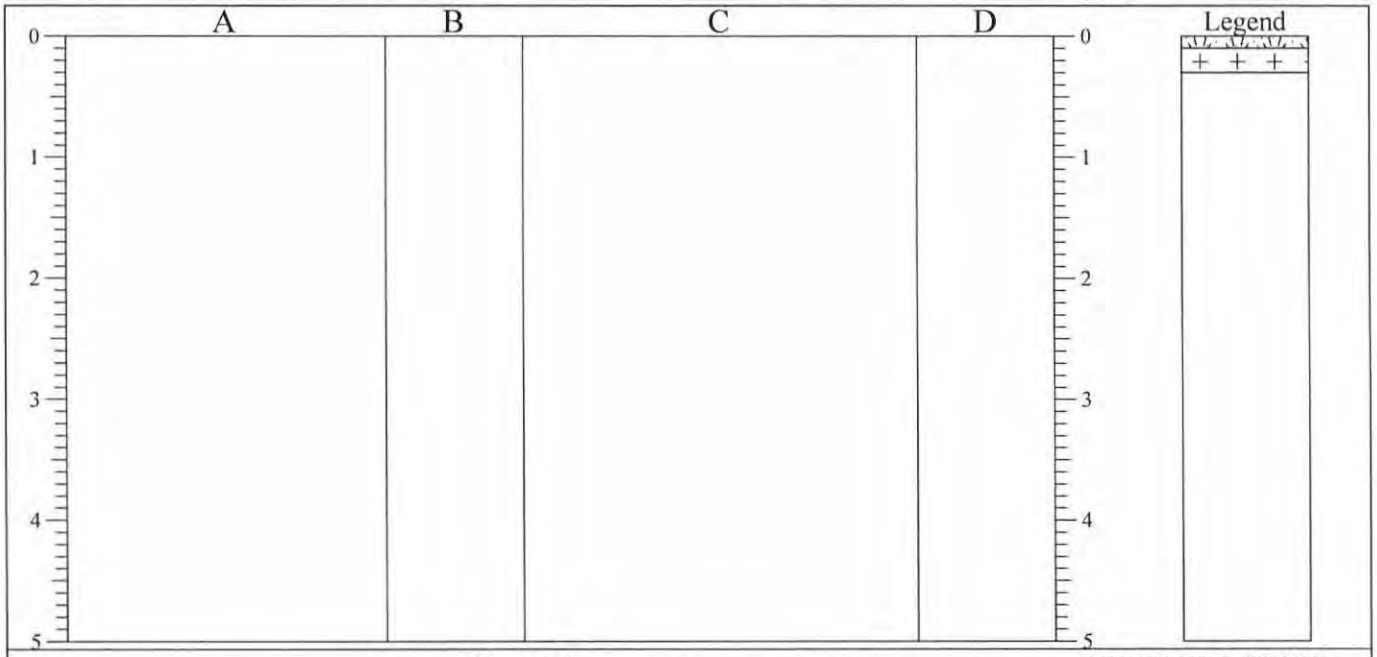
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1401
Job No	Date 11-10-06 11-10-06	Ground Level (m) 12.31	Co-Ordinates () E 121,320.8 N 222,578.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

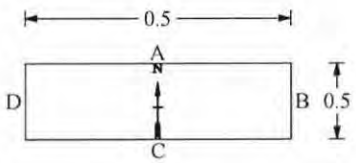


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Soft damp brown slightly sandy gravelly silty/clayey TOPSOIL with some subangular and angular cobbles with many roots and rootlets.			0.00-0.15	J	
0.10-0.30		Broken rock at 0.1m bgl. Recovered as grey speckled white and pink GRANITE.					
0.30		TP abandoned at 0.3m bgl obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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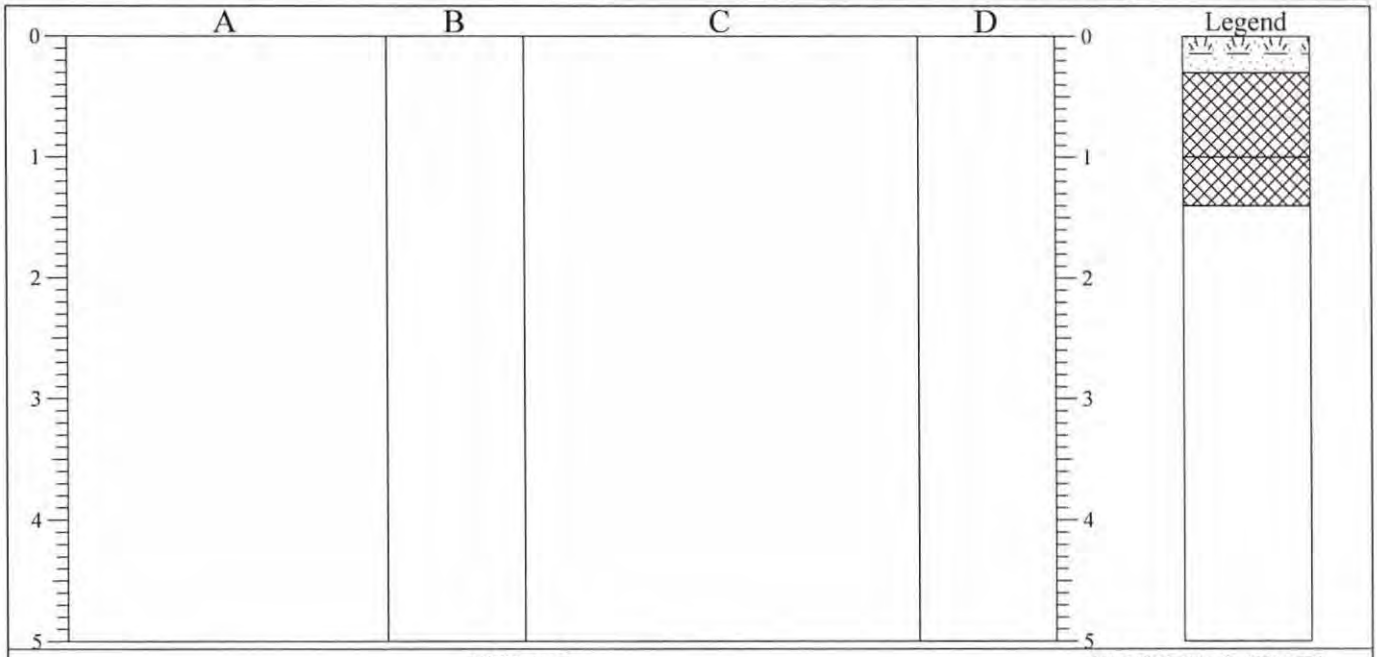
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1402
Job No	Date 16-10-06 16-10-06	Ground Level (m) 29.15	Co-Ordinates () E 121,295.5 N 223,019.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

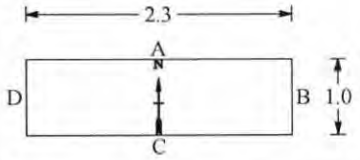


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.30		Soft damp TOPSOIL with many roots and rootlets.					
0.30-1.00		MADE GROUND: Dark brown gravelly sandy SILT with many angular to rounded cobbles and some angular to subrounded with boulders. Boulders are up to 500mm in size.			0.20-0.75	J	
					0.75-1.40	B	
1.00-1.40		MADE GROUND: Damp light brown mottled orange and dark brown gravelly very silty SAND with many angular to subrounded cobbles and boulders. Boulders are up to 1500mm in size.			0.75-1.40	D	
					0.75-1.40	J	
1.40		TP abandoned at 1.4m bgl obstruction.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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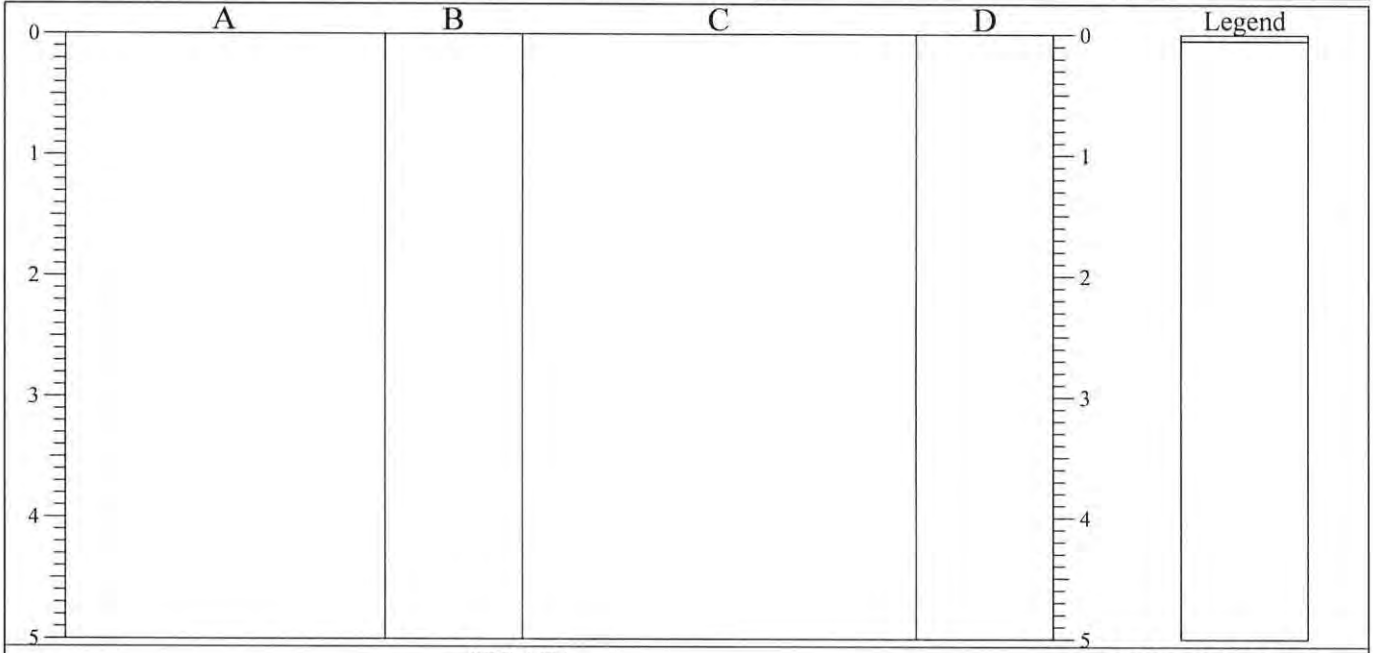
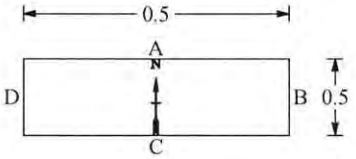
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1403
Job No	Date 12-10-06 12-10-06	Ground Level (m) 37.46	Co-Ordinates () E 121,237.8 N 223,265.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sheet 1 of 1



STRATA				SAMPLES & TESTS				
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.05 0.05		Rock at surface as brown speckled grey and white GRANITE. TP abandoned at 0.05m bgl obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation. Hand dug pit - no access for excavator.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

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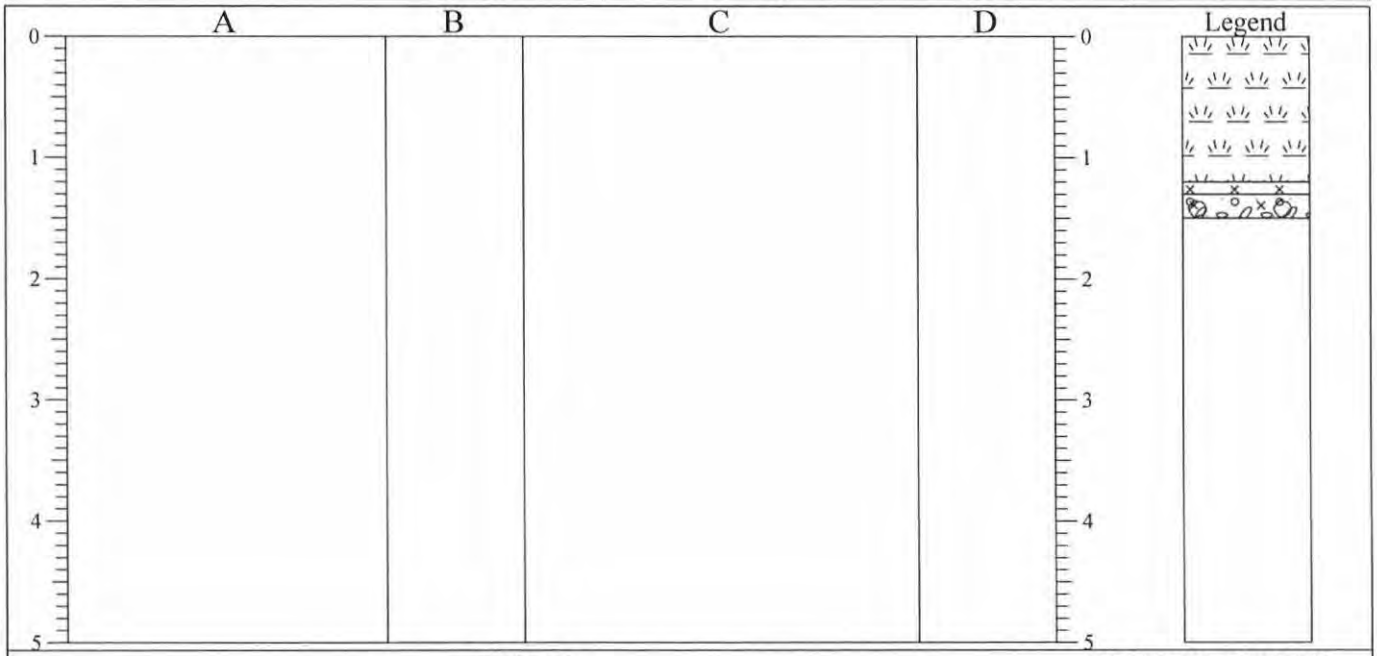
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1430
Job No	Date 10-10-06 10-10-06	Ground Level (m) 6.25	Co-Ordinates () E 127,560.1 N 228,410.1	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.00m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

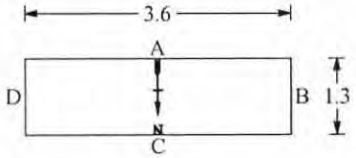


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.20		Black fibrous PEAT. H3/H4, W3.			0.50-1.00	J	
1.20-1.30		Very soft creamy grey calcareous SILT.					
1.30-1.50		Blue grey silty sandy GRAVEL with some angular to subangular cobbles and boulders. Gravel is angular to subangular and fine to medium grained.			1.30-1.50	B	
1.50		TP abandoned at 1.5m bgl. Obstruction - probable rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit stable during excavation. Inflow to TP from surface.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By MM

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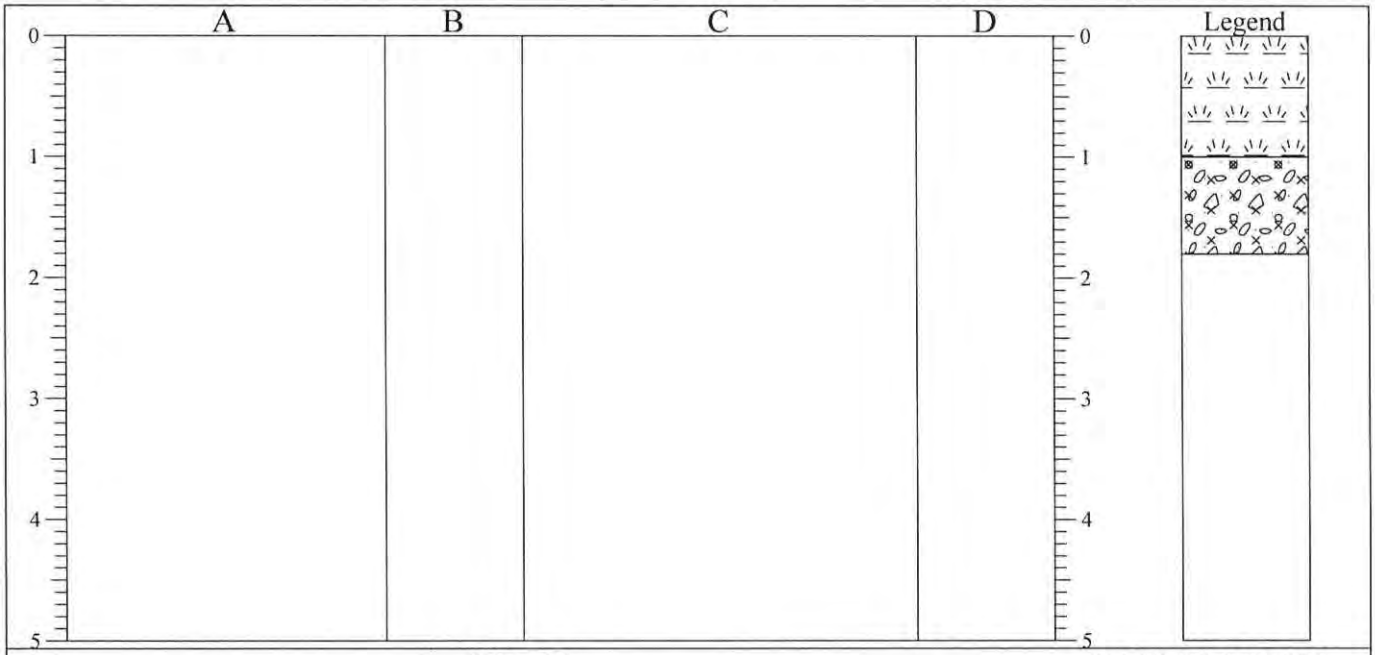
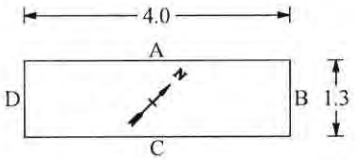
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1431
Job No	Date 10-10-06 10-10-06	Ground Level (m) 6.42	Co-Ordinates () E 127,703.7 N 228,341.4	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.30m 2nd: 3rd:	Rose to (@ 20 min.): 0.40m	Sheet 1 of 1



STRATA					SAMPLES & TESTS		
Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-1.00		Grass over black PEAT. H3/H4, W2.		1	0.30 0.50-1.00	W J	
1.00-1.80		Blue grey silty very sandy GRAVEL. Gravel is rounded to subangular and fine to medium grained.			1.00-1.50	B	
1.80		TP abandoned at 1.8m bgl. Obstruction - probable rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Moderate ingress of water from 0.3m bgl. Pit stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By MM

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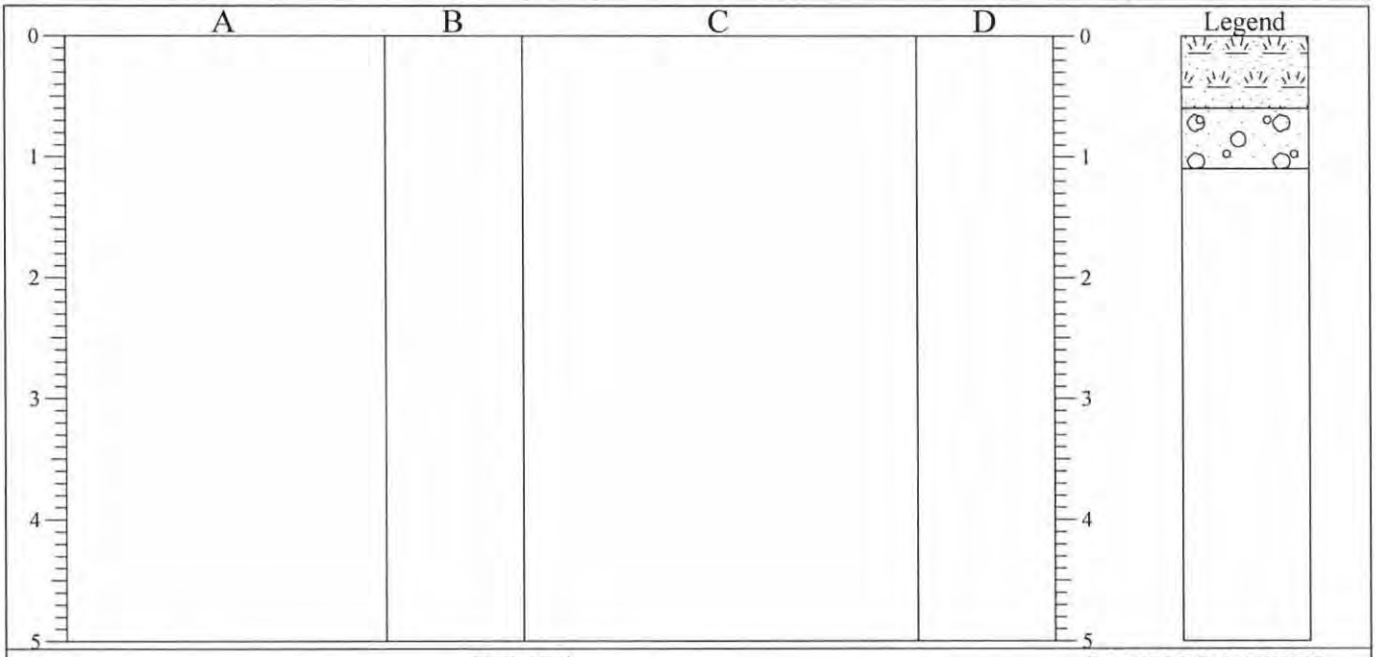
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1432
Job No	Date 26-09-06 26-09-06	Ground Level (m) 16.97	Co-Ordinates () E 128,656.6 N 227,986.4	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd: Rose to (@ 20 min.): Sealed at:			Sheet 1 of 1

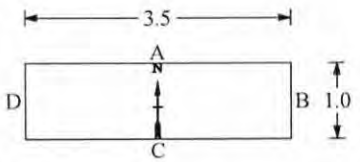


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.60		Brown sandy clayey TOPSOIL.					
0.60-1.10		Grey SAND & GRAVEL limestone cobbles and boulders. Cobbles and boulders are subrounded to subangular. Boulders are 600-700mm in size. Gravel is subrounded to subangular and is coarse grained.			0.50-0.60	D	
1.10		TP abandoned at 1.1m bgl. Obstruction - probable limestone rock or boulders.			1.00-1.10 1.00-1.10	B D	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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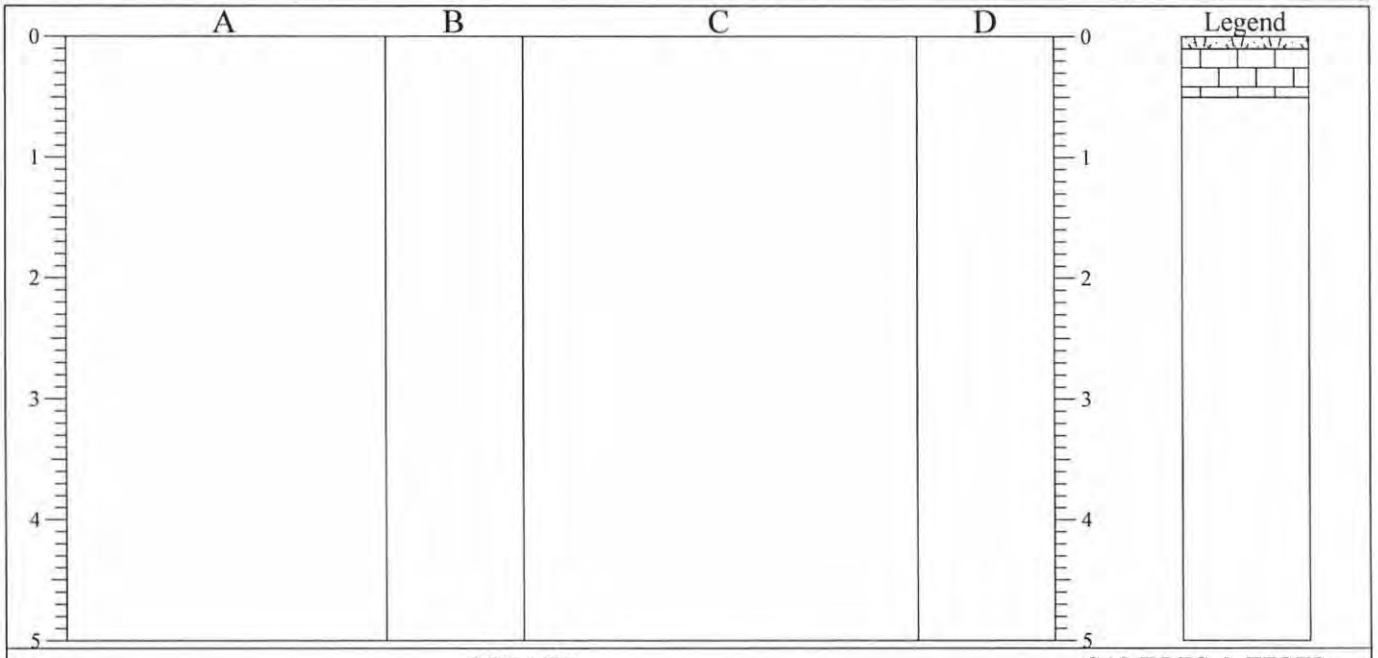
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1433
Job No	Date 27-09-06 27-09-06	Ground Level (m) 14.30	Co-Ordinates () E 128,755.9 N 228,065.0	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

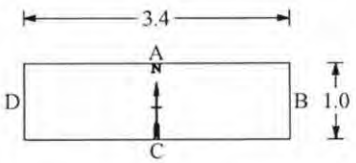


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		TOPSOIL.					
0.10-0.50		Possible rock. Recovered as clay band limestone cobbles and boulders. Cobbles and boulders are tabular to subangular. Boulders are 1500-2000mm in size. Becoming strong with depth.			0.40-0.50	D	
0.50		TP abandoned at 0.5m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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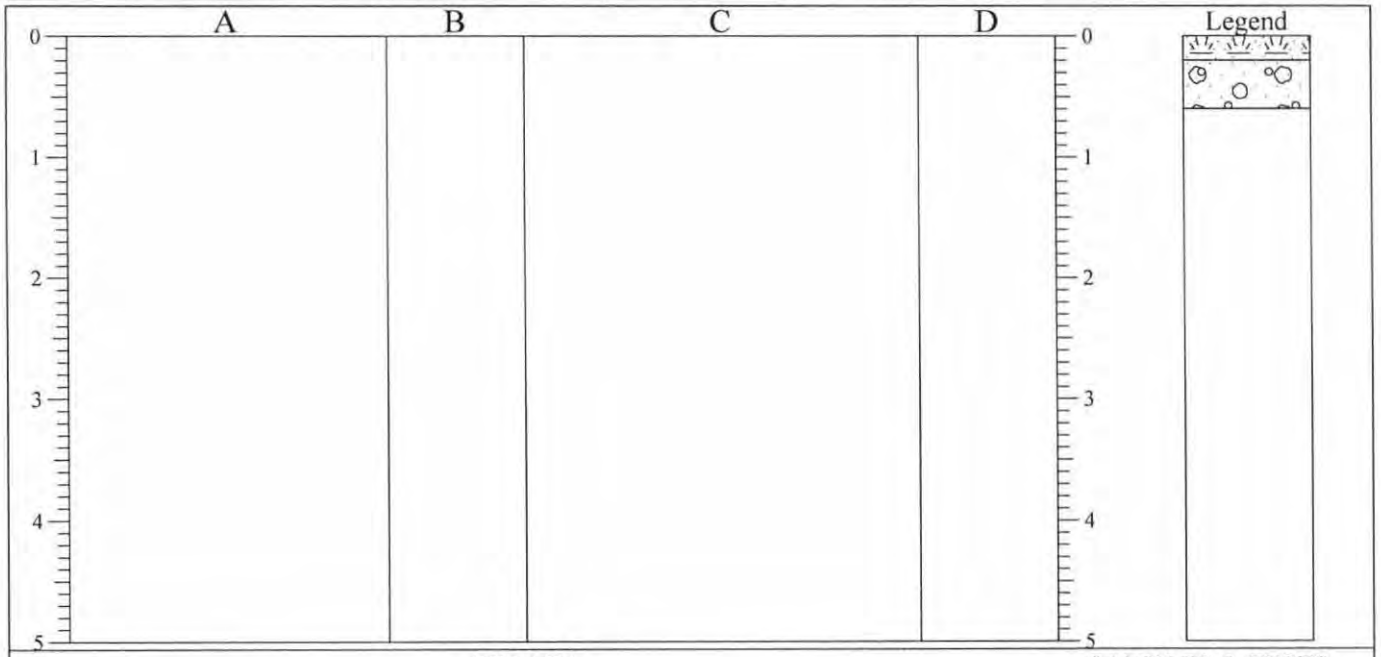
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1434
Job No	Date 27-09-06 27-09-06	Ground Level (m) 16.13	Co-Ordinates () E 128,784.9 N 228,047.7	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

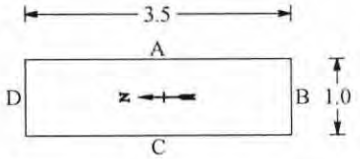


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		Brown sandy clayey TOPSOIL.					
0.20-0.60		Grey SAND & GRAVEL limestone cobbles and boulders. Cobbles and boulders are rounded to subrounded. Boulders are 600-700mm in size. Gravel is subrounded to subangular and is coarse grained.					
0.60		TP abandoned at 0.6m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used KF ex 135	Bit Design	Logged By DK

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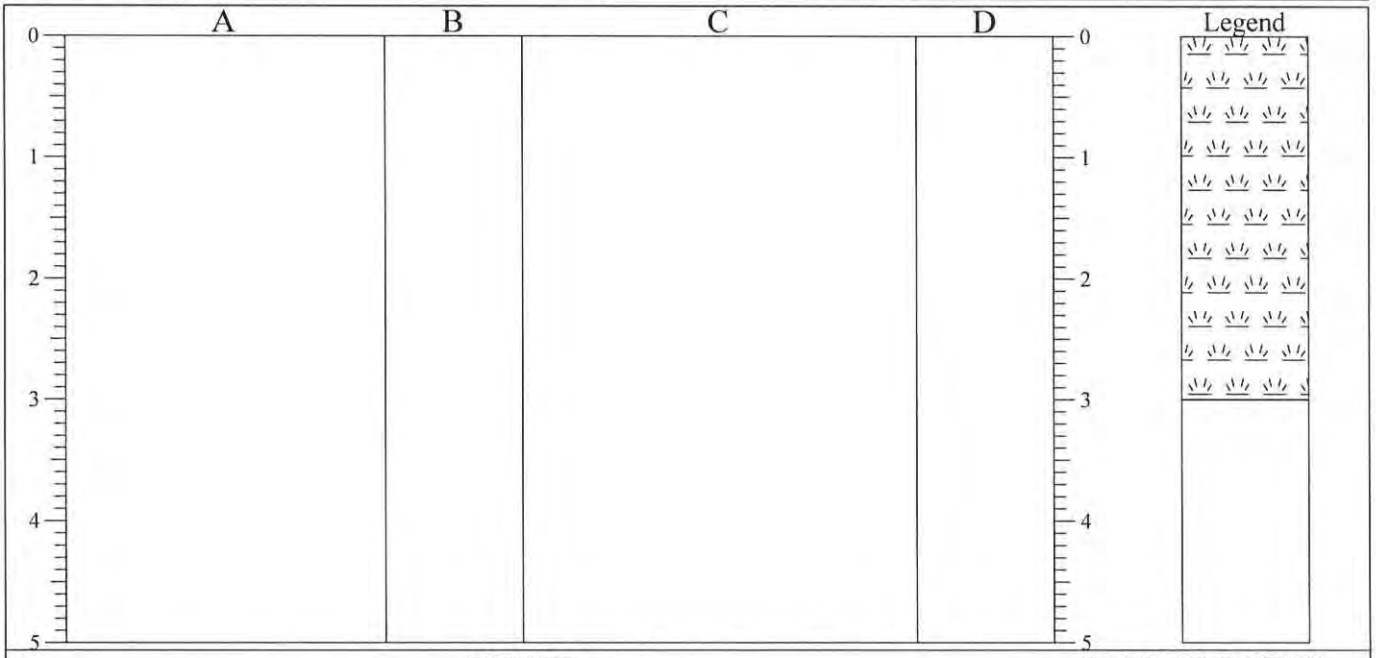
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1435
Job No	Date 14-11-06 14-11-06	Ground Level (m) 6.24	Co-Ordinates () E 129,001.7 N 227,958.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 2.50m 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

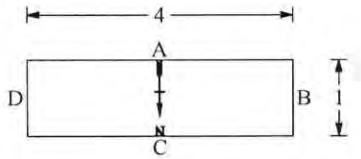


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-3.00		Soft light brown fibrous PEAT with many rootlets.			1.00	B	
					1.00	J	
					2.00	B	
				1	2.00	J	
3.00		Pit abandoned - constant collapse of pit sides.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Collapsing of sides.Water seepage at 2.50m.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex120	Bit Design	Logged By DK

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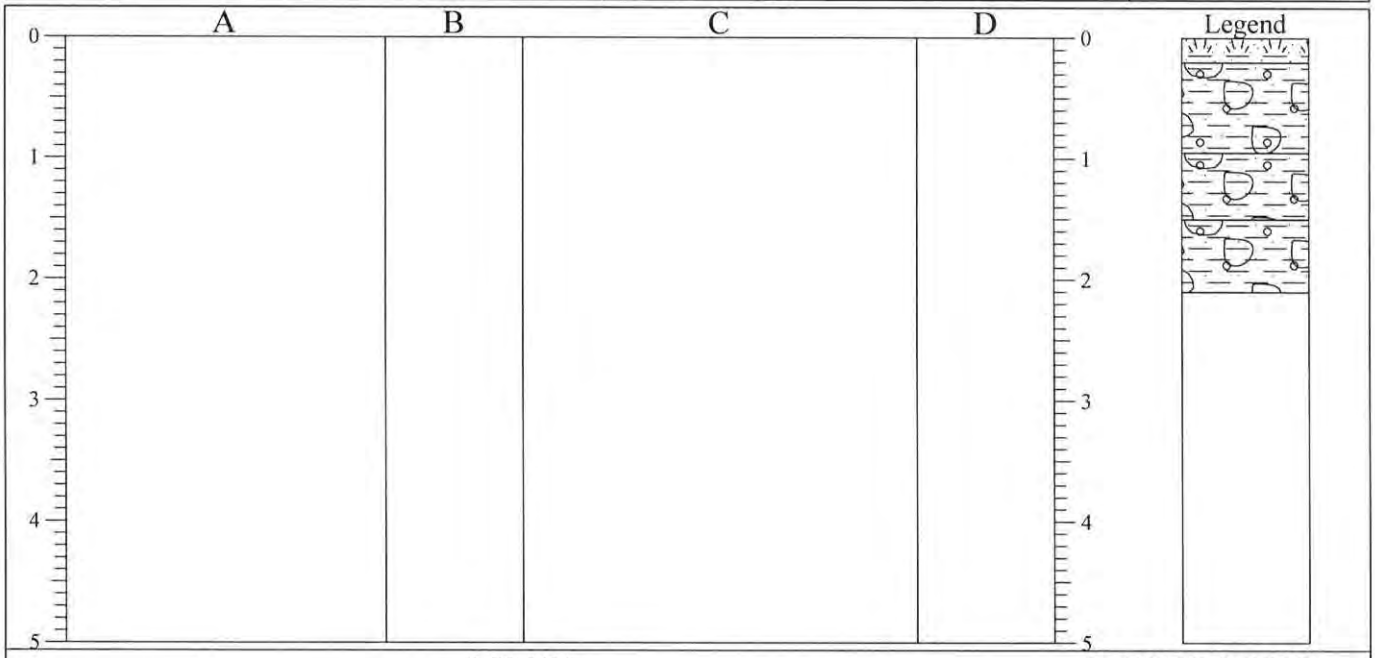
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1436
Job No	Date 25-10-06 25-10-06	Ground Level (m) 19.32	Co-Ordinates () E 129,155.4 N 228,113.8	
Contractor IDL	GROUNDWATER STRIKES Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at:	Sheet 1 of 1

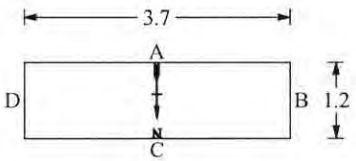


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.20		TOPSOIL with many roots and rootlets.			0.00-0.48	J	
0.20-0.95		Firm damp brown slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subrounded to subangular boulders. Boulders are up to 290mm in size.			0.48-1.00	B	
					0.48-1.00	D	
					0.48-1.00	J	
0.95-1.50		Firm damp grey mottled brown and orange slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subangular to angular boulders. Boulders are up to 300mm in size.			1.00-2.10	D	
					1.00-2.10	J	
1.50-2.10		Stiff damp grey mottled brown and orange slightly sandy gravelly SILT/CLAY with some subrounded to subangular cobbles and rare subangular to angular boulders. Boulders are up to 400mm in size.			1.50-2.10	B	
2.10		TP abandoned at 2.1m bgl. Obstruction - probable limestone rock or boulders.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable between 0.6m and 1.2m bgl. Pit dry during excavation.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

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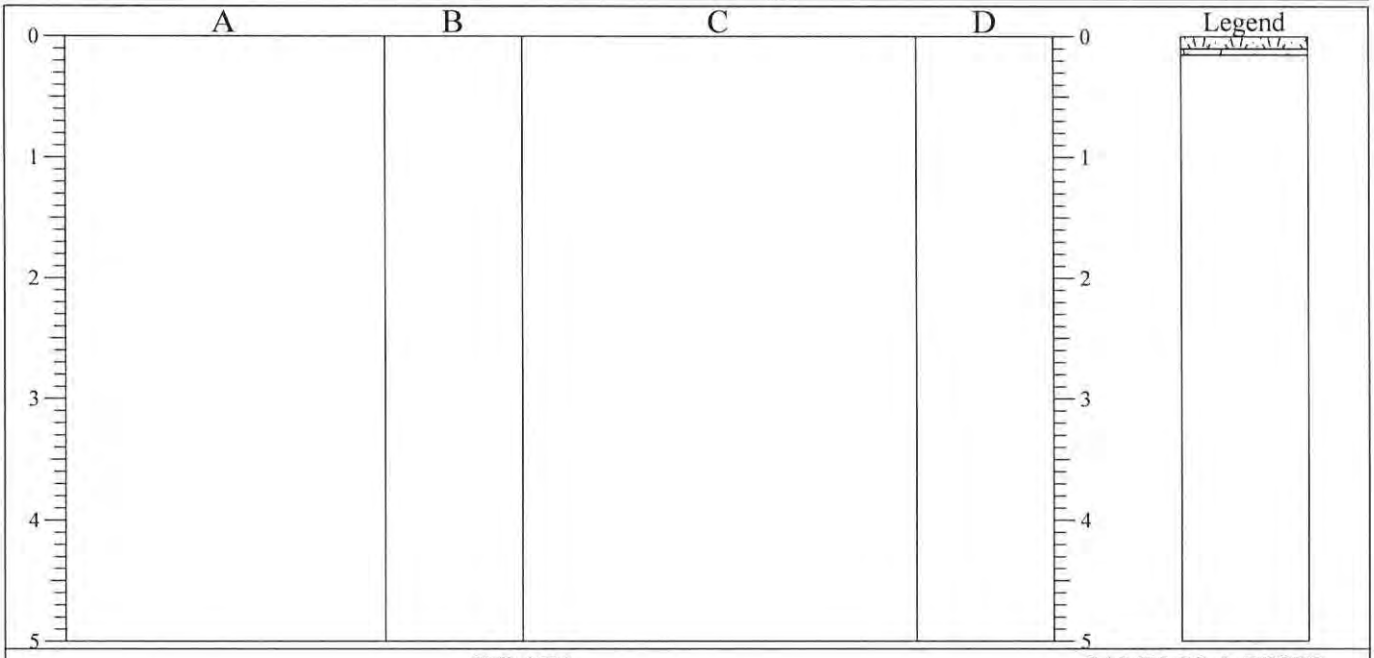
TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1437
Job No	Date 25-10-06 25-10-06	Ground Level (m) 15.24	Co-Ordinates () E 129,309.4 N 228,203.5	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1

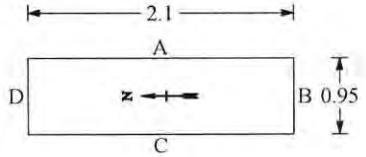


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		TOPSOIL with many roots and rootlets.			0.00-0.15	J	
0.10-0.15		Soft damp dark brown slightly sandy slightly gravelly SILT/CLAY with some angular to subrounded cobbles and rare subangular to angular boulders. Boulders are up to 300mm in size.					
0.15		TP abandoned at 0.15m bgl. Obstruction - probable limestone rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

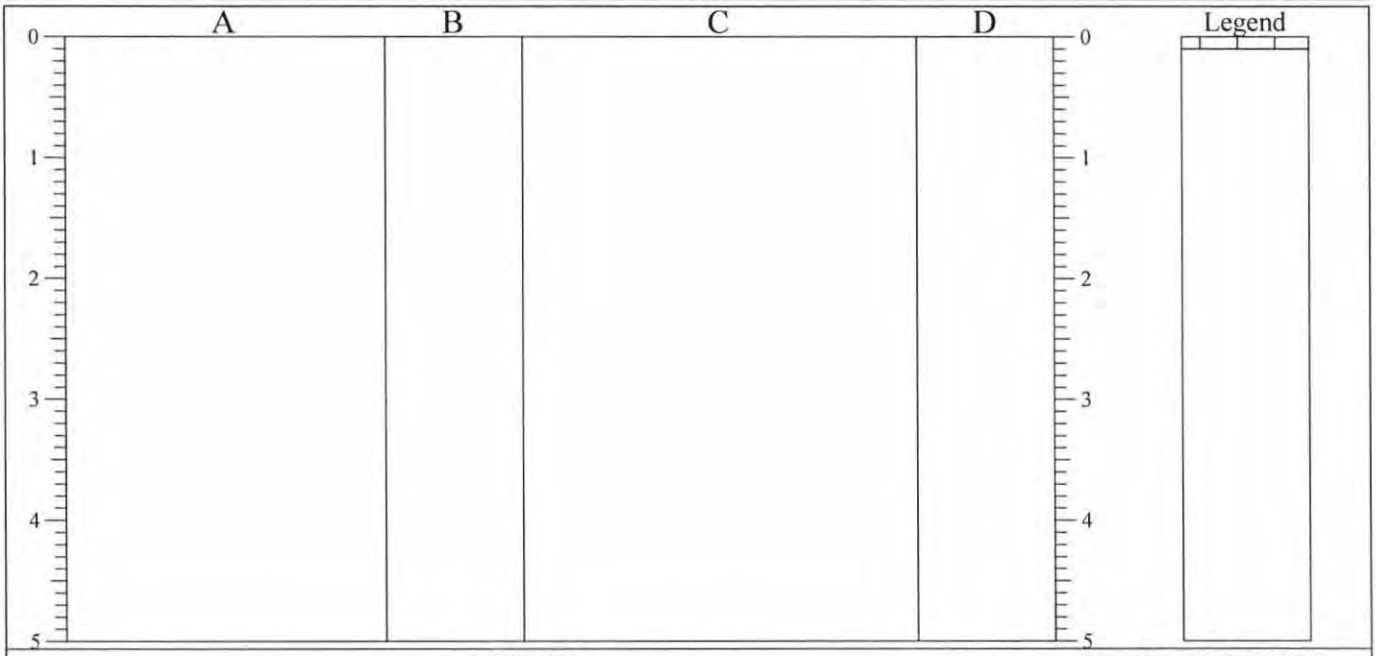
All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

IRISH DRILLING LTD.
LOUGHREA, CO. GALWAY
Telephone: 091 841274
Fax: 091 847687

TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1438
Job No	Date 26-10-06 26-10-06	Ground Level (m) 15.91	Co-Ordinates () E 129,428.7 N 228,258.2	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: dry 2nd: 3rd:	Rose to (@ 20 min.): Sealed at:	Sheet 1 of 1

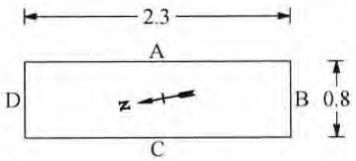


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	In Situ Tests	Water	Depth (m)	No	Remarks/Tests
0.00-0.10		Broken rock at surface as light grey LIMESTONE.			0.00-0.10	J	
0.10		TP abandoned at 0.1m bgl. Obstruction - probable rock.					

Shoring/Support:
Stability:



GENERAL REMARKS

Pit dry, stable during excavation.

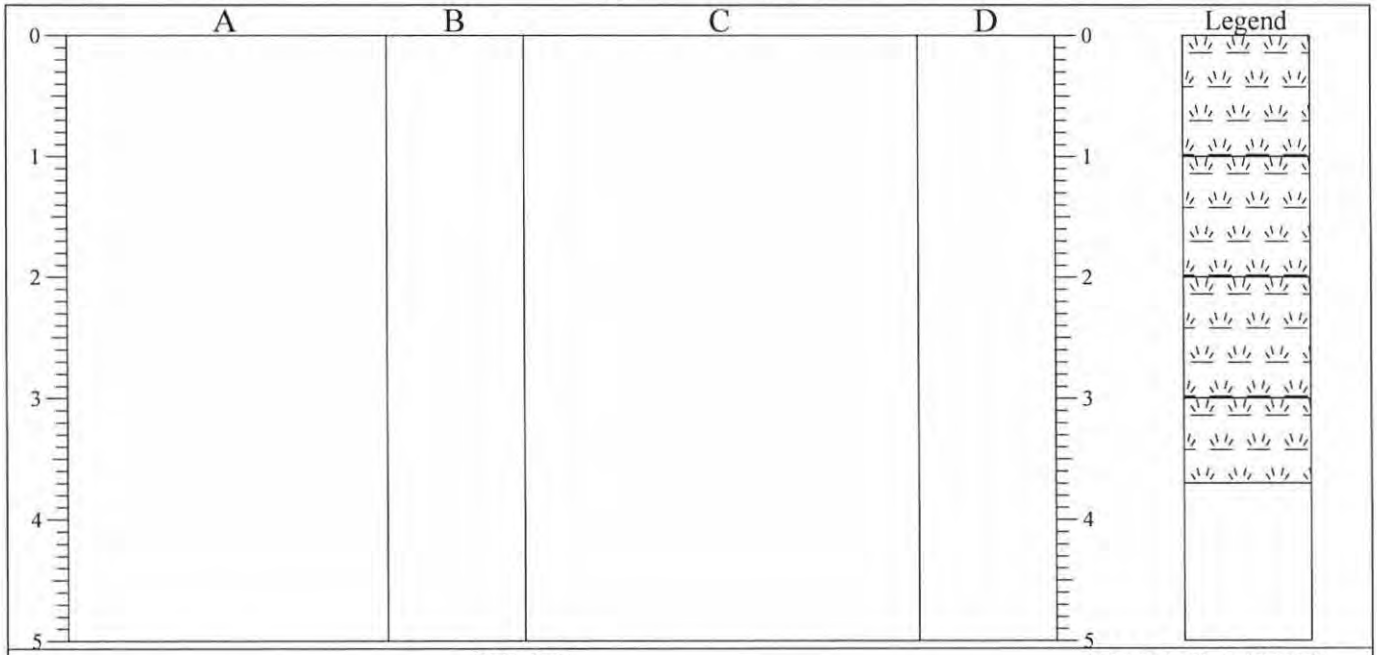
All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 135	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

IDL
IRISH DRILLING LTD.
LOUGHREA, CO. GALWAY
Telephone: 091 841274
Fax: 091 847687

TRIAL PIT LOG

Project				TRIAL PIT No
N6 Galway City Outer Bypass				TP 1439
Job No	Date 04-12-06 04-12-06	Ground Level (m) 9.46	Co-Ordinates () E 131,254.0 N 228,790.3	
Contractor IDL	GROUNDWATER STRIKES	Water strikes: 1st: 0.00m 2nd: 3rd:	Rose to (@ 20 min.):	Sealed at: Sheet 1 of 1



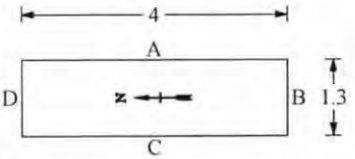
STRATA

Depth	No	DESCRIPTION	In Situ Tests	Water
0.00-1.00		Very soft dark brown PEAT (H3,B3,P0,W0,N0,TV2,TH2,A0,P0,F0).		
1.00-2.00		Very soft dark brown PEAT (H4,B3,F3,W1,N2,TV2,TH1,A1,P0).		
2.00-3.00		Very soft dark brown PEAT (H7,B3,F3,W1,N1,TV1,TH0,A1,P1,R1).		
3.00-3.70		Very soft dark brown PEAT (H8,B2,F3,W0,N1,TV0,TH0,A2,P1,R2) with traces of cream grey calcareous silt and and roots.		
3.70		Pit abandoned - constant collapse of pit sides and surface water ingress.		

SAMPLES & TESTS

Depth (m)	No	Remarks/Tests
0.70	B	
0.70	J	
1.70	B	
1.70	J	
2.50	B	
2.50	J	
3.10	B	
3.10	J	

Shoring/Support:
Stability:



GENERAL REMARKS

Pit unstable during excavation.Collapsing of sides from 1.20m depth.Very fast water ingress from surface.

All dimensions in metres Scale 1:62.5	Client Galway County Council	Method/ Plant Used Hitachi ex 60	Bit Design	Logged By TS

IDL AGS3 UK TP GALWAYBYPASSN6TPSLAB2.GPJ AGS 3_1.GDT 30/01/07

Appendix A.9.1.2

Phase 1 Contract 1, N6 Galway City Transport Project Phase 1 Ground Investigation Contract 1, July 2014

IRISH DRILLING LIMITED

LOUGHREA, CO. GALWAY, IRELAND

CONTRACT DRILLING
SITE INVESTIGATION

Phone: (091) 841 274
Fax: (091) 880 861
email: info@irishdrilling.ie

GCOB PHASE 1
GROUND INVESTIGATION

GALWAY

SITE INVESTIGATION

FACTUAL REPORT

Arup,
50 Ringsend Rd.,
Dublin 4

Galway City Council,
City Hall,
College Rd.,
Galway.

Contents:

1.0 Introduction.

Irish Drilling Ltd. was instructed by Arup to carry out a site investigation for Galway City Outer Bypass (GCOB) Phase 1, on behalf of the client Galway County Council.

The site investigation has been carried out to assess the ground conditions and provide data to assist in the design of earthworks and foundations.

The fieldwork commenced on July 3rd 2014 and was completed on July 23rd 2014.

This Report presents the factual data.

2.0 Site & Geology

The site is located at Knocknacarra on the west side of Galway City. The boreholes are located about 300m apart as shown on the Site Plan.

The geology of the area is generally Glacial Till, overlying the Galway Granite.

3.0 Fieldwork.

The fieldwork consisted of the following:

Two rotary core boreholes were drilled using PQ (84mm dia. core) wire-line drilling equipment, with plastic liner used to assist core recovery and this was reduced to PQ (65mm diameter) below 18.6m in Bh RC-1-001 and 17.0m in Bh RC-1-002.

Standard Penetration Tests were carried out in the overburden in both boreholes.

A standpipe (19mm dia.) was installed in both boreholes, with the response zones extending between 20m and 25m depth.

The boreholes were logged by an engineering geologist from this company. The borehole records are included in Appendix 1.

Laboratory testing was carried out on representative rock samples. Tests included Point Load Index (PLT) and UCS tests. The laboratory test results are presented in Appendix 2.

Photographs of the rock cores are included in Appendix 3.

A Geophysical survey was carried out by Minerex Geophysics Limited and the report is included in Appendix 4.

The borehole locations were surveyed, to National co-ordinates, using a Trimble CU Bluetooth Total Station.

4.0 Ground conditions.

Generally the boreholes encountered Glacial till of varying consistency, over granite rock.

Rock was encountered at 5.1m in RC-1-001 and 6.2m in RC-1-002 and generally consists of very strong to extremely strong grey fine to coarse grained granite, micro-granite, dolerite and felsic porphyry with predominantly medium spaced and frequently closely spaced fractures.

Reference should be made to the logs in Appendix 1 for detailed descriptions of the soils and rock.

4.1 Groundwater.

Groundwater was recorded in standpipes at the following depths:

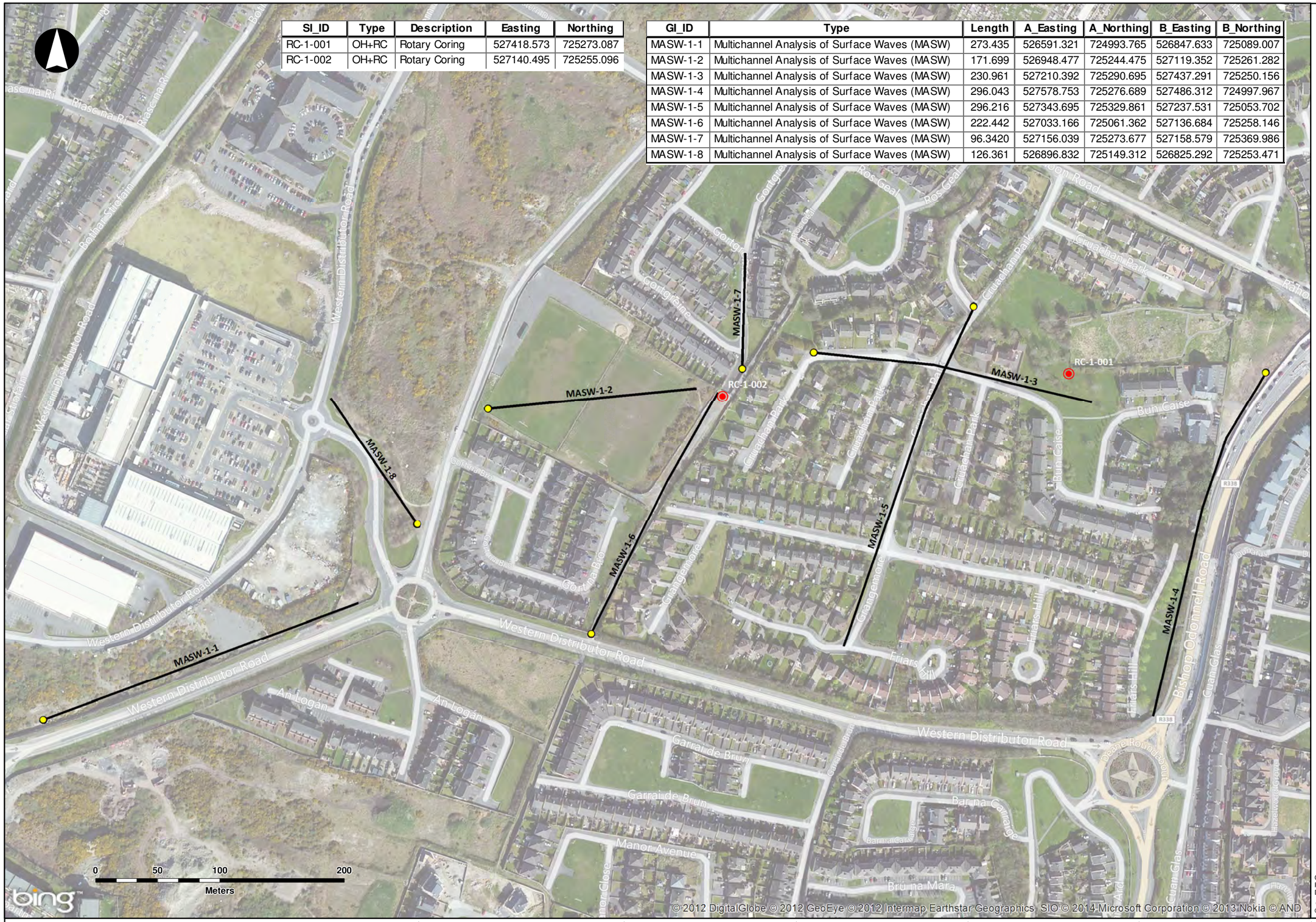
Location	RC-1-001	RC-1-002
13 Aug. ’14 11:25	3.51m *(21.24m O.D.)*	6.15m *(31.16m O.D.)*

Declan Joyce, B.E., M.Eng.Sc., C.Eng., M.I.E.I.
Chartered Geotechnical Engineer

A3

SI_ID	Type	Description	Easting	Northing
RC-1-001	OH+RC	Rotary Coring	527418.573	725273.087
RC-1-002	OH+RC	Rotary Coring	527140.495	725255.096

GI_ID	Type	Length	A_Easting	A_Northing	B_Easting	B_Northing
MASW-1-1	Multichannel Analysis of Surface Waves (MASW)	273.435	526591.321	724993.765	526847.633	725089.007
MASW-1-2	Multichannel Analysis of Surface Waves (MASW)	171.699	526948.477	725244.475	527119.352	725261.282
MASW-1-3	Multichannel Analysis of Surface Waves (MASW)	230.961	527210.392	725290.695	527437.291	725250.156
MASW-1-4	Multichannel Analysis of Surface Waves (MASW)	296.043	527578.753	725276.689	527486.312	724997.967
MASW-1-5	Multichannel Analysis of Surface Waves (MASW)	296.216	527343.695	725329.861	527237.531	725053.702
MASW-1-6	Multichannel Analysis of Surface Waves (MASW)	222.442	527033.166	725061.362	527136.684	725258.146
MASW-1-7	Multichannel Analysis of Surface Waves (MASW)	96.3420	527156.039	725273.677	527158.579	725369.986
MASW-1-8	Multichannel Analysis of Surface Waves (MASW)	126.361	526896.832	725149.312	526825.292	725253.471



ROUTE OPTIONS

Legend

- Phase One Site Investigation - Boreholes
- Phase One Site Investigation - Geophysical Surveys

Note: Geophysical survey starting point (A) is displayed using a yellow dot

Coordinate System: IRENET95 Irish Transverse Mercator
Projection: Transverse Mercator
Datum: IRENET95

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Clients

Consultant

ARUP
50 Ringsend Road
Dublin 4
Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169
www.arup.com

Job Title
N6 Galway City Outer Bypass

Scale: **1:3,000**

Date: **June 2014**

Issue	Date	By	Chkd	Appd
P1	10/06/2014	CMtS	PQ	EMcC

Drawing Title
Geotechnical Information
Proposed Ground Investigation

Drawing Status
Information

Job No	Drawing No	Issue
233985-00	GCOB-SK-R-600-001	P1

APPENDIX 1

BOREHOLE RECORDS

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-001**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	09-07-14 16-07-14	24.75	E 527,416.2 N 725,273.6

Engineer	Sheet	Rev.
ARUP	1 of 4	1

RUN DETAILS					STRATA			
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION Discontinuities Detail	Main	Geology	Instrument/ Backfill
09.07 0.00	80 (-) -	1.00(30/40mm)				0.00 - 5.10 5.10m: overburden.	Subrounded to sub-angular fine to coarse GRAVEL with a little brown slightly sandy clay. Sand is fine and medium. Gravel is of assorted lithologies including assorted grey limestone and grey and pink granitic clasts.		
1.00									
	50 (-) -	2.00 (16)							
2.60					(5.10)				
	75 (-) -	3.00(54/95mm)							
09.07 4.10		4.00(30/45mm)							
10.07	25 (-) -								
4.90		5.00(30/25mm)	19.65		5.10				
	100 (71) 0	20				5.10 - 7.20 Non-intact as fractured rock.	Strong to extremely strong thinly flow banded greenish grey groundmass with dark green rounded and cubic fine and medium grained phenocrysts as DOLERITE.		
11.07 6.00									
11.07	100 (28) 10	NI			(2.10)				
11.07 7.20			17.55		7.20				
14.07	100 (70) 27	9				7.20 - 12.00 Discontinuities, very closely spaced, dipping 70 to 72o, irregular, smooth, with ~0.5mm thick milky white calcitic smear and ~0.5mm thick grey clay smear.			

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
09-07-14	08.00	0.00	0.00	150	84		-
09-07-14	17.00	4.10	4.10	150	84		2.90
10-07-14	08.00	4.10	4.10	150	84		2.70
11-07-14	08.00	6.00	6.00	150	84		2.60
11-07-14	17.00	7.20	6.00	150	84		3.00
14-07-14	08.00	7.20	6.00	150	84		2.80
14-08-14	11.30		standpipe				3.51

Rotary Flush

From (m)	To (m)	Type	Return (%)
0	3.00	water	100%
3	6.30	water	0%
6.3	30.1	water	100%

GENERAL REMARKS

Driller described rock as extremely strong and difficult to drill between 5.1m and 18.9m.19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: DC	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-001**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	09-07-14 16-07-14	24.75	E 527,416.2 N 725,273.6

Engineer	Sheet	Rev.
ARUP	2 of 4	1

RUN DETAILS					STRATA				
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
8.10								Strong to extremely strong and occasionally medium strong, thinly flow banded pink groundmass with milky white dark grey and white fine and medium grained phenocrysts as fine and medium grained MICROGRANITE. *(continued)*		
	100 (96) 46	9								
9.80		10								
	100 (68) 0	NI								
10.07 10.70 10.07										
	100 (54) 0				(8.40)					
14.07 11.60 15.07		7								
	100 (81) 60							12.00m: phenocrysts becoming coarse grained.		
12.60		5								
	100 (96) 81									
13.60		6								
	100 (98) 51									
14.50		6								
	100 (97) 78							15.00m to 18.60m: with 'anastomosing' milky white calcitic veins and veinlets. 15.05m to 15.60m: pink groundmass with dark green and grey phenocrysts coarse.		
15.60		3	9.15		15.60					
		7				15.60 - 18.90 Discontinuities, closely spaced to 16.00m, then medium				

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
10-07-14	17.00	10.70	4.10	150	84		2.90
14-07-14	17.00	11.60	6.00	150	84		3.10
15-07-14	08.00	11.60	6.00	150	84		2.70

Rotary Flush

From (m)	To (m)	Type	Return (%)

GENERAL REMARKS

Driller described rock as extremely strong and difficult to drill between 5.1m and 18.9m.19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used	Hydreq	Bit Design	Driller DC	Logged By EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-001**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	09-07-14 16-07-14	24.75	E 527,416.2 N 725,273.6

Engineer	Sheet	Rev.
ARUP	3 of 4	1

RUN DETAILS					STRATA			
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
17.10	100 (98) 81	2				spaced, dipping 30 to 32o, planar, locally irregular, smooth, with a ~0.5mm thick grey calcitic smear and minor orange brown iron stain.	Strong to extremely strong thinly flow banded green groundmass with elongated dark green rounded and cubic fine and medium grained phenocrysts FELSIC PORPHYRY. *(continued)* 16.50m to 17.70m: with visible finely disseminated pyrite.	
17.80	100 (94) 88	3			(3.30)			
15.07 18.60	100 (95) 79	7						
16.07			5.85		18.90			
19.90	100 (96) 76	2	4.85		(1.00) 19.90	18.90 - 19.90 Discontinuities, medium spaced, dipping 22 to 24o, irregular, smooth, with ~5mm thick yellowish cream clay smear.	Extremely strong thinly flow banded pink groundmass with grey milky white black and dark green coarse grained GRANITE.	
21.50	100 (95) 72	1 8				19.90 - 25.80 Discontinuities, medium spaced, locally closely spaced, dipping 20 to 22o to 22.50m, then 30 to 32o, undulating, smooth, with ~<0.5mm thick grey clay smear.	Very strong to extremely strong, weakly thinly flow banded, greyish green groundmass with white and dark green elongated rounded and cubic fine and medium grained phenocrysts, FELSIC PORPHYRY.	
23.00	100 (97) 69	8 7			(5.90)			
	100 (96) 88	5						

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
15-07-14	17.00	18.60	6.00	150	84		3.00
16-07-14	08.00	18.60	6.00	150	65		2.50

Rotary Flush

From (m)	To (m)	Type	Return (%)

GENERAL REMARKS

Driller described rock as extremely strong and difficult to drill between 5.1m and 18.9m.19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: DC	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-001**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	09-07-14 16-07-14	24.75	E 527,416.2 N 725,273.6

Engineer	Sheet	Rev.
ARUP	4 of 4	1

RUN DETAILS					STRATA				
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
24.60		6						Very strong to extremely strong, weakly thinly flow banded, greyish green groundmass with white and dark green elongated rounded and cubic fine and medium grained phenocrysts, FELSIC PORPHYRY. *(continued)*		
	100 (97) 77	6	-1.05		25.80					
25.90						25.80 - 27.00 Discontinuities, medium spaced, dipping 20 to 22o, undulating, smooth, with ~1mm thick grey clay smear.		Extremely strong thinly flow banded pink groundmass with black and grey and white fine and medium grained phenocrysts as medium grained GRANITE.		
	100 (90) 80	8			(1.20)					
27.00			-2.25		27.00					
	100 (94) 84	4				27.00 - 29.50 Discontinuities, medium spaced, locally closely spaced, dipping 38 to 40o, undulating, smooth, with ~1mm thick grey clay smear.		Very strong to extremely strong, thinly flow banded, dark greenish grey groundmass, with elongated rounded and cubic pink and white and rare dark green fine and medium grained, FELSIC PORPHYRY.		
28.60		5			(2.50)					
	100 (96) 74	3	-4.75		29.50					
16.07 30.10		3	-5.35		(0.60) 30.10	29.50 - 30.10 Discontinuities, closely spaced, dipping 38 to 40o, irregular, rough, with ~1mm thick brown clay smear.		Very strong to extremely strong, thinly flow banded groundmass, with black and grey and white fine and medium grained phenocrysts as medium grained GRANITE.		
								BH terminated at 30.10m bgl on REs instruction.		

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
16-07-14	17.00	30.10	6.00	150	65		2.90

Rotary Flush

From (m)	To (m)	Type	Return (%)

GENERAL REMARKS

Driller described rock as extremely strong and difficult to drill between 5.1m and 18.9m.19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: DC	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-002**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	18-07-14 23-07-14	37.31	E 527,125.0 N 725,237.3

Engineer	Sheet	Rev.
ARUP	1 of 4	1

RUN DETAILS						STRATA				
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
18.07 0.00						0.00 - 6.20 : overburden.		Angular to sub-angular medium to coarse GRAVEL. Gravel is of assorted lithologies including assorted grey limestone and pink granitic clasts.		
			36.81		(0.50) 0.50					
			36.51		0.80			Orange brown sandy gravelly CLAY. Sand is fine to medium. Gravel is sub-angular fine of limestone.		
	63 (-) -	1.00 (16)						Brownish grey slightly sandy gravelly CLAY with cobbles. Sand is fine. Gravel is sub-angular to rounded fine to coarse of limestone with rare sandstone clasts. Cobbles are of limestone.		
1.90										
	42 (-) -	2.00 (19)								
3.10		3.00 (25)								
	75 (-) -				(5.40)					
		4.00 (18)								
4.30										
	82 (-) -	5.00(30/25mm)								
5.40										
	100 (14) 0									
6.10			31.11		6.20					
		8				6.20 - 30.00 Discontinuities, closely spaced to 8.00m, medium spaced to 27.30m, then closely spaced, dipping 54 to 56o, planar, locally undulating, smooth, with <0.5mm thick grey clay smear and ~0.5mm thick light green calcareous smear.		Extremely strong and occasionally very strong, weakly thickly flow banded, pink groundmass, with pink, black, grey and milky white, coarse grained GRANITE.		
	100 (85) 46									
18.07 7.20		3								
21.07	100 (100) 100									
7.60										

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
18-07-14	08.00	0.00	0.00	150	84		
18-07-14	17.00	7.20	6.00	150	84		
21-07-14	08.00	7.20	6.00	150	84		6.40
14-08-14	11.20		standpipe				6.15

Rotary Flush

From (m)	To (m)	Type	Return (%)
0	30.00	water	100%

GENERAL REMARKS

Driller described rock as extremely strong and slow to drill .
19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: TH/BD	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	**RC-1-002**

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	18-07-14 23-07-14	37.31	E 527,125.0 N 725,237.3

Engineer	Sheet	Rev.
ARUP	2 of 4	1

RUN DETAILS					STRATA				
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
8.90	100 (90) 73	3						Extremely strong and occasionally very strong, weakly thickly flow banded, pink groundmass, with pink, black, grey and milky white, coarse grained GRANITE. *(continued)*		
10.50	100 (98) 95	3 4								
12.10	100 (98) 92	3 2								
12.80	100 (96) 94									
14.10	100 (98) 96	2 2								
15.60	100 (98) 96	2 3						15.40m to 17.80m: groundmass becoming brownish pink.		
	100 (100)									

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	Driller described rock as extremely strong and slow to drill . 19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: TH/BD	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

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DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	RC-1-002

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	18-07-14 23-07-14	37.31	E 527,125.0 N 725,237.3

Engineer	Sheet	Rev.
ARUP	3 of 4	1

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
16.10	100							Extremely strong and occasionally very strong, weakly thickly flow banded, pink groundmass, with pink, black, grey and milky white, coarse grained GRANITE. *(continued)*	
	100 (97) 96	0							
17.70		1							
	100 (98) 96	1			(23.80)			17.80m to 30.00m: groundmass becoming pinkish grey.	
21.07 / 21.07									
21.07 19.20									
22.07	100 (98) 97	3							
20.60		2							
	100 (98) 97	2							
22.10		2							
	100 (96) 94	2							
22.90									
	100 (99) 99	0							
23.90									

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
21-07-14	15.00	18.60	18.60	125	84		8.00
21-07-14	17.00	19.20	18.60	125	65		8.00
22-07-14	08.00	19.20	18.60	125	65		8.00

Rotary Flush

From (m)	To (m)	Type	Return (%)

GENERAL REMARKS

Driller described rock as extremely strong and slow to drill .
19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: TH/BD	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

Irish Drilling Limited
Old Galway Rd
Loughrea, Co. Galway
Telephone: 091 841274
Fax: 091 880861

DRILLHOLE LOG

Project	Location	DRILLHOLE No
GCOB - Phase 1	Knocknacarra, Galway	RC-1-002

Job No	Date	Ground Level (m)	Co-Ordinates ()
2014G117	18-07-14 23-07-14	37.31	E 527,125.0 N 725,237.3

Engineer	Sheet	Rev.
ARUP	4 of 4	1

RUN DETAILS					STRATA				
Depth / Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
24.60	100 (100) 100	0						Extremely strong and occasionally very strong, weakly thickly flow banded, pink groundmass, with pink, black, grey and milky white, coarse grained GRANITE. *(continued)*		
25.90	100 (98) 97	1								
27.00	100 (98) 96	1								
28.00	100 (97) 95	2								
28.90	100 (96) 90	4								
22.07 30.00	100 (96) 80	9	7.31		30.00					
23.07								BH terminated at 30.00m bgl on REs instruction.		

Drilling Progress and Water Observations

Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing
22-07-14	17.00	30.00	18.60	125	65		8.70
23-07-14	08.00	30.00	18.60	125	65		8.40

Rotary Flush

From (m)	To (m)	Type	Return (%)

GENERAL REMARKS

Driller described rock as extremely strong and slow to drill .
19mm piezometer installed.

All dimensions in metres Scale 1:50	Client	Method/ Plant Used: Hydreq	Bit Design	Driller: TH/BD	Logged By: EAT

IDL AGS UK DH (SPTS) GCOB RC1.GPJ IDL TP TEMPLATE.GDT 15/8/14

APPENDIX 2

LABORATORY TEST RESULTS

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274 Fax: (091) 880861

Contract:	GCOB - Phase 1
Client:	Galway City Council
Engineer:	ARUP
Date:	12-Aug-14
Tested by: DMJ	Checked: JDJ

Point Load Tests (ISRM Methods)

Borehole	Depth	D	W	De^2	P	Is	F	$Is_{(50)}$	UCS	Remarks
						MPa		MPa	MPa	
RC-1-001	4.96-5.04	84.7	84.7	7174	21.0	2.93	1.268	3.71	90.91	Strong
	6.60-6.76	84.7	84.7	7174	18.4	2.56	1.268	3.25	79.66	Strong
	7.20-7.45	84.7	84.7	7174	20.0	2.79	1.268	3.53	86.58	Strong
	9.40-9.55	84.8	84.8	7191	50.0	6.95	1.268	8.82	216.07	Extremely Strong
	10.12-10.23	85.0	85.0	7225	40.0	5.54	1.270	7.03	172.22	Very Strong
	10.75-10.90	85.0	85.0	7225	4.0	0.55	1.270	0.70	17.22	Medium Strong
	12.05-12.25	85.0	85.0	7225	19.8	2.74	1.270	3.48	85.25	Strong
	13.00-13.17	85.0	85.0	7225	15.0	2.08	1.270	2.64	64.58	Strong
	14.31-14.50	85.3	85.3	7276	32.3	4.44	1.272	5.65	138.31	Very Strong
	14.74-14.92	85.0	85.0	7225	23.0	3.18	1.270	4.04	99.03	Strong
	16.60-16.76	85.0	85.0	7225	26.0	3.60	1.270	4.57	111.94	Very Strong
	17.67-17.80	85.0	85.0	7225	15.5	2.15	1.270	2.72	66.74	Strong
	18.06-18.30	85.0	85.0	7225	15.0	2.08	1.270	2.64	64.58	Strong
	19.00-19.25	63.1	63.1	3982	37.0	9.29	1.110	10.32	252.81	Extremely Strong
	21.50-21.65	63.1	63.1	3982	18.9	4.75	1.110	5.27	129.14	Very Strong
	23.00-23.20	63.1	63.1	3982	32.8	8.24	1.110	9.15	224.11	Extremely Strong
	24.90-25.08	63.1	63.1	3982	24.0	6.03	1.110	6.69	163.98	Very Strong
	26.07-26.27	63.1	63.1	3982	23.5	5.90	1.110	6.55	160.57	Very Strong
	27.00-27.18	63.2	63.2	3994	17.5	4.38	1.111	4.87	119.28	Very Strong

IRISH DRILLING LTD.
Loughrea Co. Galway

Tel: (091) 841274 Fax: (091) 880861

Contract:	GCOB - Phase 1
Client:	Galway City Council
Engineer:	ARUP
Date:	12-Aug-14
Tested by: DMJ	Checked: JDJ

Point Load Tests (ISRM Methods)

Borehole	Depth	D	W	De^2	P	Is	F	$Is_{(50)}$	UCS	Remarks
						MPa		MPa	MPa	
RC-1-002	6.95-7.15	85.1	85.1	7242.01	35.0	4.83	1.270	6.14	150.42	Very Strong
	7.30-7.45	85.1	85.1	7242.01	60.0	8.28	1.270	10.53	257.86	Extremely Strong
	8.40-8.60	63.2	63.2	3994.24	31.0	7.76	1.111	8.62	211.29	Extremely Strong
	9.00-9.22	63.2	63.2	3994.24	32.0	8.01	1.111	8.90	218.11	Extremely Strong
	11.14-11.27	63.2	63.2	3994.24	44.0	11.02	1.111	12.24	299.90	Extremely Strong
	12.26-12.41	63.1	63.1	3981.61	45.0	11.30	1.110	12.55	307.47	Extremely Strong
	13.09-13.28	63.2	63.2	3994.24	46.0	11.52	1.111	12.80	313.53	Extremely Strong
	14.55-14.75	63.2	63.2	3994.24	42.5	10.64	1.111	11.82	289.67	Extremely Strong
	15.60-15.82	63.2	63.2	3994.24	38.5	9.64	1.111	10.71	262.41	Extremely Strong
	16.36-16.51	63.2	63.2	3994.24	29.0	7.26	1.111	8.07	197.66	Very Strong
	18.15-18.30	63.2	63.2	3994.24	30.5	7.64	1.111	8.49	207.88	Extremely Strong
	19.50-19.64	63.3	63.2	4000.56	45.0	11.25	1.112	12.50	306.34	Extremely Strong
	20.70-20.86	63.3	63.2	4000.56	49.0	12.25	1.112	13.61	333.57	Extremely Strong
	22.10-22.27	63.2	63.2	3994.24	40.0	10.01	1.111	11.13	272.63	Extremely Strong
	22.90-23.06	63.2	63.2	3994.24	26.0	6.51	1.111	7.23	177.21	Very Strong
	24.40-24.60	63.2	63.2	3994.24	44.0	11.02	1.111	12.24	299.90	Extremely Strong
	25.10-25.30	63.2	63.2	3994.24	28.0	7.01	1.111	7.79	190.84	Very Strong
	26.34-26.54	63.2	63.2	3994.24	38.5	9.64	1.111	10.71	262.41	Extremely Strong
	27.34-27.48	63.2	63.2	3994.24	31.5	7.89	1.111	8.76	214.70	Extremely Strong
	28.54-28.67	63.2	63.2	3994.24	21.0	5.26	1.111	5.84	143.13	Very Strong
	29.00-29.20	63.2	63.2	3994.24	6.0	1.50	1.111	1.67	40.89	Medium Strong

Irish Drilling Ltd

Uniaxial Compressive Strength of rock cores
ASTM D7012-07

Contract	GCOB Phase 1 Ground Investigation	**Job Code:**	14G117
Client	Galway City Council	**Date:**	12/08/2014
Engineer	**ARUP Consulting Engineers**	**Tested By:**	DMJ

Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Bulk density . . (Mg/m3)	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (MPa)	Strength Designation:BSEN ISO14689-1:2003
RC-1-001	8.40-8.70	84.97	181.47	2.630	167.0	Vertical Shear	211.00	37.2	Medium Strong
	12.70-13.00	85.02	186.93	2.630	170.0	Vertical Shear	186.80	32.9	Medium Strong
	17.43-17.70	85.06	186.66	2.720	231.0	Vertical Shear	133.20	23.4	Weak
	23.50-23.86	63.05	*157.24*	2.660	105.0	Diagonal	66.80	21.4	Weak

Irish Drilling Ltd

Uniaxial Compressive Strength of rock cores

ASTM D7012-07

Contract	GCOB Phase 1 Ground Investigation	**Job Code:**	14G117
Client	Galway City Council	**Date:**	12/08/2014
Engineer	**ARUP Consulting Engineers**	**Tested By:**	DMJ

Borehole No:	Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Bulk density . . (Mg/m3)	Test Duration (secs)	Mode of Failure	Maximum Load (kN)	Uniaxial Compressive Strength (MPa)	Strength Designation:BSEN ISO14689-1:2003
RC-1-002	6.22-6.42	84.99	172.93	2.630	200.0	Vertical Shear	294.80	52.0	Strong
	9.22-9.62	63.19	157.38	2.620	193.0	Vertical Shear	220.50	70.3	Strong
	12.85-13.09	63.09	151.24	2.640	359.0	Vertical Shear	537.40	171.9	Very Strong
	16.10-16.36	63.10	153.33	2.640	210.0	Vertical Shear	297.50	95.1	Strong
	22.42-22.59	63.50	*137.60*	2.600	287.0	Vertical Shear	349.70	110.4	Very Strong

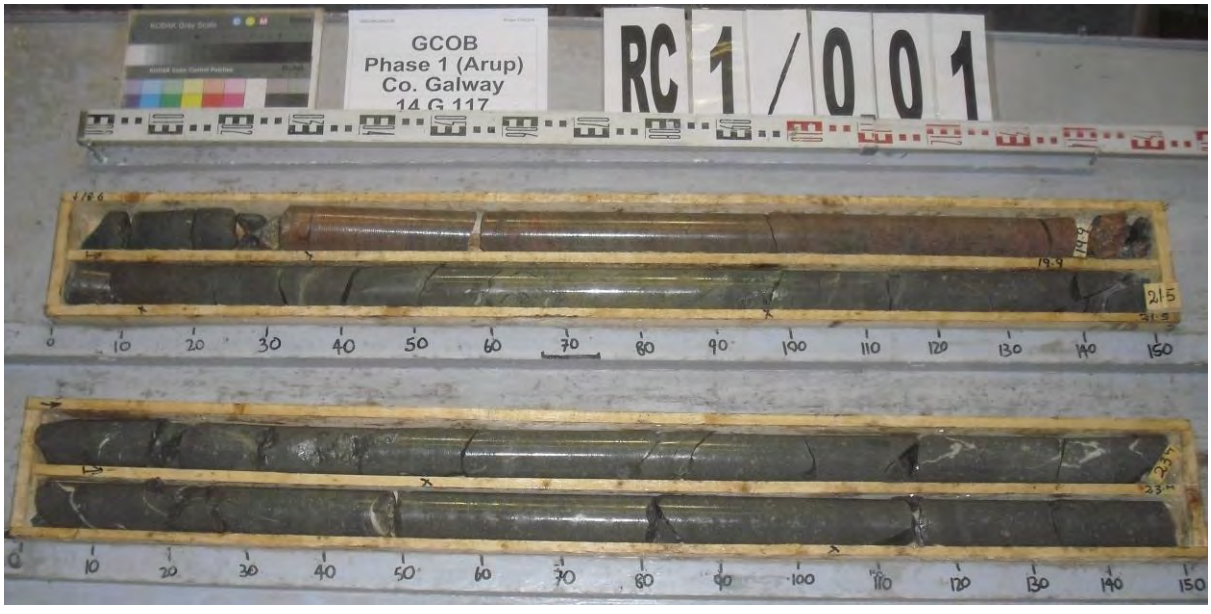
APPENDIX 3

PHOTOGRAPHS


GCOB
Phase 1 (Arup)
Co. Galway
14 G 117
RC 1 / 0 0 1
0.0
1m
2.6m
4.1m
4.9
6m
8.1m
9.2


GCOB
Phase 1 (Arup)
Co. Galway
14 G 117
RC 1 / 0 0 1
9.8m
10.7
11.6m
12.6
13.6m


GCOB
Phase 1 (Arup)
Co. Galway
14 G 117
RC 1 / 0 0 1
14.5
15.6m
17.8m


GCOB
Phase 1 (Arup)
Co. Galway
14 G 117
RC 1 / 0 0 1
21.5
23.7


GCOB
Phase 1 (Arup)
Co. Galway
14 G 117
RC 1 / 0 0 1
24.6
25.8
27m
28.6
30m


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1 0 0 2 BH 2
3·1
5·4
7·2m


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1 0 0 2 BH 2
7·6
8·9
10·5
10·5
12·1m


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1002 BH2


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1002 BH2


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1002 BH2


GCOB
Phase 2 (Arup)
Co. Galway
14 G 117
RC 1002 BH2

APPENDIX 4

GEOPHYSICAL SURVEY

Galway City Outer Bypass Phase 1

Geophysical Survey

Report Status: Draft

MGX Project Number:5820

MGX File Ref: 5820d-005.doc

23rd July 2014

Confidential Report To:

Irish Drilling Limited
Old Galway Road
Loughrea
Co. Galway

Arup
50 Ringsend Road
Dublin 4

Report submitted by :
Minerex Geophysics Limited

Unit F4, Maynooth Business Campus
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Tel.: 01-6510030
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Issued by:

Ruth Jackson (Senior Geophysicist)

Hartmut Krahn (Senior Geophysicist)

Minerex Geophysics Limited

Subsurface Geophysical Investigations

EXECUTIVE SUMMARY

1. Minerex Geophysics Ltd. (MGX) carried out a geophysical survey consisting seismic refraction (p-wave) and MASW (s-wave) for the ground investigation of the N6 Galway City Outer Bypass, at Rahoon, Galway city.

2. The main objectives of the survey were to determine ground conditions, estimate the depth to bedrock and the strength of the overburden.

3. Ground conditions were modelled with four layers that represent the transition from soft/loose overburden to strong granite rock.

4. The uppermost layer is generally thin (1m) and comprises topsoil, made ground, overburden and solid pavement surfaces. The geological material within this layer is soft or loose.

5. Layer 2 has a thickness of 1 to 5 m and mainly overburden with firm – stiff compaction but may contain some very weathered granite, especially large boulders.

6. A transitional layer between overburden and fresh granite bedrock contains poor to fair weathered granite or some highly consolidated hard or very dense overburden material.

7. The depth to top of strong granite rock varies between 3 and 12 m bgl. below the survey profiles.

8. The rock is generally shallower on the higher elevated parts of the survey area. The transitional layer 3 containing weathered rock and highly consolidated overburden is usually thicker where is appears deeper under the ground surface.

9. The MASW survey showed results with mixed quality due to shallow rock and changing ground conditions. Ranges for shear wave velocity and small strain shear modulus (G_{max}) have been defined for the overburden. Values of 150 – 500 m/s for velocity and 45 – 500 MPa for G_{max} have been modelled.

CONTENTS

List of Tables, Maps and Figures:

1. INTRODUCTION

1.1 Background

Minerex Geophysics Ltd. (MGX) carried out a geophysical survey for the Galway City Outer Bypass (GCOB) Phase 1. The survey consisted of seismic refraction (p-wave) and MASW (s-wave) measurements for the ground investigation. The survey was commissioned by Irish Drilling Ltd. acting on behalf of Arup.

The role of geophysics as a non-destructive fast method is to allow later targeted direct investigations. Those results can be used to improve the initial results and interpretation.

The proposed development is along the existing roads and open park areas, with approx. 1720 m of geophysics to be carried out.

The survey was aimed both at investigating the depth to intact rock using seismic refraction, while using MASW along the same lines to measure the shear wave velocity and small strain shear modulus of the overburden.

1.2 Objectives

The main objectives of the geophysical survey were:

- To determine the depth to bedrock
- To estimate the strength/stiffness/compaction of overburden materials and the quality of rock
- To determine the type of overburden and rock

1.3 Site Description

The site is located at Rahoon in Galway city. The site consists of a residential area bounded by the Western Distributor Road.

1.4 Geology

Ground conditions are summarised as made ground (asphalt, concrete pavements, granular fill) over natural sandy gravelly till. The bedrock geological map of Galway Bay (GSI, 2004) indicates that the survey area is underlain by Devonian granite.

1.5 Report

This report includes the results and interpretation of the geophysical survey. Maps, figures and tables are included to illustrate the results of the survey. More detailed descriptions of geophysical methods and measurements can be found in GSEG (2002), Milsom (1989) and Reynolds (1997).

The client provided maps of the site and the digital version were used as the background map in this report. Elevations were surveyed / taken from the supplied maps and vertical sections.

The interpretative nature and the non-invasive survey methods must be taken into account when considering the results of this survey and Minerex Geophysics Limited, while using appropriate practice to execute, interpret and present the data, give no guarantees in relation to the existing subsurface.

2. GEOPHYSICAL SURVEY

2.1 Methodology

The methodology consisted of MASW in conjunction with seismic refraction as outlined in the tender documents.

The survey locations are indicated on Map 1. The profiles, locations, chainage and parameters are tabulated in Tab. 1.

All geophysical surveys are acquired, processed and reported in accordance with British Standards BS 5930:1999 +A2:2010 'Code of Practice for Site Investigations'.

Table 1: Data Acquisition Parameters for Geophysical Profiles

Line Number	**Profile Name**	**Geophone Spacing/m**	**Profile Length/m**
Line 1	S33 - 38	2	286
Line 2	S6 - 9	2	176
Line 3	S12 - 14 S18 - 19	2	218
Line 4	S27 – 32	2	286
Line 5	S20 - 26	2	300
Line 6	S1 - 5	2	238
Line 7	S10 - 11	2	94
Line 8	S15 - 17	2	128

2.2 Seismic Refraction

The seismic survey consisted of p-wave seismic refraction profiling at the locations shown on Map 1. Each of the profiles consisted of 24 geophones with 2 m spacing, resulting in lengths of 46m per profile. The recording equipment consisted of a 24 Channel GEOMETRICS ES-3000 engineering seismograph with 4.5 Hz vertical geophones. The seismic energy source consisted of a hammer and plate. A zero delay trigger was used to start the recording. At least 7 shot points per p-wave profile were used.

In the seismic refraction survey method a p-wave is generated by a source at the surface resulting in energy travelling through surface layers directly and along boundaries between layers of differing seismic wave velocities. Processing of the seismic data allows geological layer thicknesses and boundaries to be established.

Seismic Refraction generally determines the depth to horizontal or near horizontal layers where the compaction/strength/rock quality changes with an accuracy of 10 – 20% of depth to that layer. Where low velocity layers or shadow zones are present or where layers dip with more than 20 degrees angle the accuracy becomes much less.

In areas with thick concrete or tarmac a low velocity layer exists for the seismic waves below the hard surface layer. This makes it less certain or impossible to pick first breaks from geophones near the source and therefore no velocity determination for the shallow subsurface is possible. This results in larger deviations in the modelling and borehole results are required for a final calibration of the results.

During the survey hard standing surfaces were avoided as much as possible but in some locations the survey had to follow the road or footpath. On Line 4 at S29 and S30 the survey went over a heavily reinforced concrete footpath and a negative effect was caused for the data. On Line 3 at S18 and S19 there was also some detrimental effect on the data from the solid surface layer.

2.3 MASW (Multichannel Analysis of Surface Waves)

The seismic shear wave velocity was determined by active MASW surveying. MASW (Multi-Channel Analysis of Surface Waves) determines the bulk seismic shear wave velocity versus depth. The velocities are used to determine the small strain shear modulus versus depth.

The MASW method was acquired along with the seismic refraction survey though the shots were done with a larger time window. The MASW used 24 geophones with 2 m spacing and a length of 46m per profile. The recording equipment consisted of a 24 Channel GEOMETRICS ES-3000 engineering seismograph with 4.5 Hz vertical geophones. The seismic energy source consisted of a hammer and plate. A zero delay trigger was used to start the recording.

Many constraints exist for the MASW method and the main factors on this site that affect the methods are strong vertical velocity gradients, lateral changing velocity structure and shallow rock along some of the profiles.

2.4 Site Work

The data acquisition was carried out between the 3rd and 8th of May 2014. The weather conditions were variable throughout the acquisition period. Health and safety standards were adhered to at all times. While working on roadways the area was clearly highlighted by the use of warning signs and cones and a traffic management system was in place. Road work was carried out at night when traffic was at a minimum.

The locations and elevations were surveyed with a TRIMBLE RTK-GPS to accuracy < 0.02m.

3. RESULTS AND INTERPRETATION

The interpretation of geophysical data was carried out utilising the known response of geophysical measurements, typical physical parameters for subsurface features that may underlay the site, and the experience of the authors.

3.1 Seismic Refraction Data

The seismic refraction data was positioned and processed with the SEISIMAGER software package to give a layered model of the subsurface. The numbers of layers has been determined by analysing the seismic traces and up to 4 layers were used in the models. All seismic profiles were subject to a standardised processing sequence which consisted of a topographic correction which was based on integrated elevation data, first break picking, tomographic inversion, travel-time computation via ray-tracing and velocity modelling. Residual deviations of typically 0.5 to 1.5 msec RMS have been obtained for each profile. Following each processing stage QC procedures were adhered to. The resulting layer boundaries are shown as thick lines on the cross sections (Figures 1a – 1d). The average seismic velocities obtained within the layers are annotated on the sections as bold black numbers.

Layer 1 is generally thin (1m) and comprises topsoil, made ground, overburden and solid pavement surfaces. The seismic velocity of 300 – 500 m/s indicates that the geological material in this layer would be mainly soft or loose in term of stiffness and compaction.

Layer 2 was modelled with a velocity range of 800 – 1100 m/s and has a general thickness between 1 to 5 m. This layer is mainly overburden with firm – stiff compaction but may contain some very weathered granite, especially large boulders. The layer can be excavated by digging with some ripping. Large boulders may have to be broken up.

Layer 3 velocities of 2200 - 2400 m/s indicate a poor to fair weathered granite or some highly consolidated hard or very dense overburden material. The average depth to the top of this layer is 4 m but is variable along the profiles. The elevation/depth can be seen on the sections for the profiles in Figures 1a – 1d. The excavatability for this layer is rippable to marginal rippable though may require some breaking where large residual granite boulders are present.

The depth to top of strong rock (Layer 4 with a seismic velocity of 4400 – 4600 m/s) varies between 3 and 12 m bgl. under the survey profiles. This layer requires breaking/blasting for removal.

Table 2 summarises the interpretation. The strength/stiffness/compaction and the rock quality have been estimated from the seismic velocity. The estimation of the excavatability for the bedrock has been made according to the caterpillar chart published in Reynolds (1997). The geotechnical assessment for rippability will have to take factors like rock type and jointing into account and the estimation in this report is solely based on the seismic velocities. Excavation of rock may not be required for the future development but it gives a good indication about the rock quality.

Interpreted cross sections are shown in Figures 2a – 2d. The interpretation has been made by delineating four different layers according to their seismic velocity.

Table 2: Summary of Results and Interpretation

Layer	**General Seismic Velocity Range (km/sec)**	**Compaction/ Strength/ Rock Quality**	**Interpretation**	**Estimated Excavation Method**
1	300 - 500	Soft/Loose	Topsoil/Overburden/Pavement Layers	Diggable
2	800 - 1100	Firm-Stiff/Dense	Overburden or very weathered granite	Diggable/Rippable
3	2200 – 2400	Poor – fair Rock Hard/Very dense	Weathered Granite or highly consolidated overburden	Rippable/Marginal rippable/Some breaking
4	4400 - 4600	Strong competent Rock	Strong Granite	Breaking & Blasting

Draft results for rotary core holes indicate a similar depth to rock in drilling and geophysical survey.

3.2 MASW

The MASW profiles were positioned, processed, analysed and modelled with the SEISIMAGER/SW and the SURFSEIS3 software packages. The objective is to obtain a profile of shear wave velocity versus depth and to calculate the small strain shear modulus (stiffness) Gmax from the velocities.

For the interpretation the end shots and some other shots of each profile were analysed in order to extract the best possible dispersion curves for the modelling stage. The selected shot points were then allocated to distances along profiles and one shot (most representative of the profile) is used in the display of the results for the MASW data (Appendix A).

Following processing steps are done to achieve this:

1. Edit the shot point geometry and display the shot points for each profile
2. A dispersion curve (phase velocity versus frequency plot) is computed
3. The maximum amplitudes of the dispersion curve are selected and then the picks for the dispersion curve are truncated (frequency gate) and smoothed
4. An initial model of shear-wave velocity versus depth V_s is computed

5. An inversion is carried out to create the final V_s curve (Shear wave versus depth)
6. For stable repeatable results the shear wave velocity versus depth is displayed
7. The small strain shear modulus (also named Gmax) for each shot point and depth has been computed by using a density of 2000kg/m^3 typical for highly consolidated overburden (Eq. 1)

   (Eq. 1) $G = V_s^2 * \rho * 10^{-6}$

   Where G = Shear Modulus (MPa)

   V_s = Seismic Shear Wave Velocity (m/s)

   ρ = Density (kg/m^3)

Intensive efforts have been made to extract the best dispersion curves by time gating, trace selecting and test processing various sources versus receiver trace distances and trace ranges and by directional selection of traces. The MASW method works best on profiles where the velocity increases continuously with depth rather than where sudden velocity jumps occur (e.g. shallow rock).

Appendix A shows the results for a shot point from each line. The images for each shot are the shot record, the dispersion image (phase velocity – frequency transformation, dispersion image) and the shear wave velocity versus depth model.

These examples show the large variation of quality and quality of the shear waves and dispersion images. The first example (Line 1, Profile S36) shows a good fan of surface waves (left image) and a clear dispersion curve (indicated by the blue-green central zone within the red that rises at lower frequencies). The resulting model of s-wave velocity versus depth is well defined, the dark grey zone indicates the depth range covered by the model (The light grey part of the model at shallow and deep depths is only required for the numerical model but does not represent the ground).

The second example (Line 2, Profile 9) shows no good fan of surface waves and the dispersion image is poor, with the velocity picks only roughly indicating a possible ground model.

Table 3 give the ranges for s-wave velocities and small strain shear modulus along each profile line. The values are representative for the overburden material as the depth range generally falls within the overburden. Some comments are made about the quality of the dispersion curves and which distances along the profile the data is best.

Table 3: MASW Shear Wave Velocity

Line	Range of S-Wave Velocities (m/s) along profile	Range of Small Strain Shear Modulus (MPa) along profile	Comments
1	300 - 600	180 – 720	Good dispersion curves, the ranges are valid for the entire length of Line 1
2	300 - 400	180 – 320	Poor curves, the ranges are only apparent on some of the shots from this profile and rock velocities start to show on the dispersion curves as the rock is quite shallow and the layer surfaces quite ragged
3	150 - 500	45 – 500	Good curves, the lowest values of 150 are appearing at the end of the profile (S14) where the rock is also quite deep
4	150 - 350	45 – 245	Good curves for the relatively shallow overburden range
5	200 - 650	80 – 845	Good curves for the first half of the line, for the second part the rock is relatively shallow and high rock velocities rather than lower overburden velocities are dominating the second half of Line 5
6	300 - 600	180 – 720	Poor curves as rock is relatively shallow, only the start of the profile shows good results for the overburden
7	400 - 850	320 – 1445	Poor curves on the first half of the profile with better values for overburden on the second half where the rock is deeper
8	350 - 500	245 – 500	Good curves for the overburden range

The lowest recorded s-wave velocities are 150 m/s so it can be said that there is no very soft ground like peat, organic sediments or soft silt present under the survey profiles.

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made:

- The geophysical data from the GCOB Phase 1 survey shows that the subsurface geology can be represented by a four layer model with a transition from soft and loose overburden to strong granite rock.
- Layer 1 is generally thin (1m) and comprises topsoil, made ground, overburden and solid pavement surfaces.
- Layer 2 is mainly overburden with firm – stiff compaction but may contain some very weathered granite, especially large boulders. This layer has a thickness of 1 to 5 m.
- Layer 3 is a transitional layer between overburden and bedrock. It is a poor to fair weathered granite or some highly consolidated hard or very dense overburden material. The average depth to the top of this layer is 4 m but is variable along the profiles.
- The depth to top of strong granite rock varies between 3 and 12 m bgl. below the survey profiles.
- The rock is generally shallower on the higher elevated parts of the survey area. The transitional layer 3 containing weathered rock and highly consolidated overburden is usually thicker where is appears deeper under the ground surface.
- The MASW survey showed results with mixed quality due to shallow rock and changing ground conditions. Ranges for shear wave velocity and small strain shear modulus (G_{max}) have been defined for the overburden. Values of 150 – 500 m/s for velocity and 45 – 500 MPa for G_{max} have been modelled.

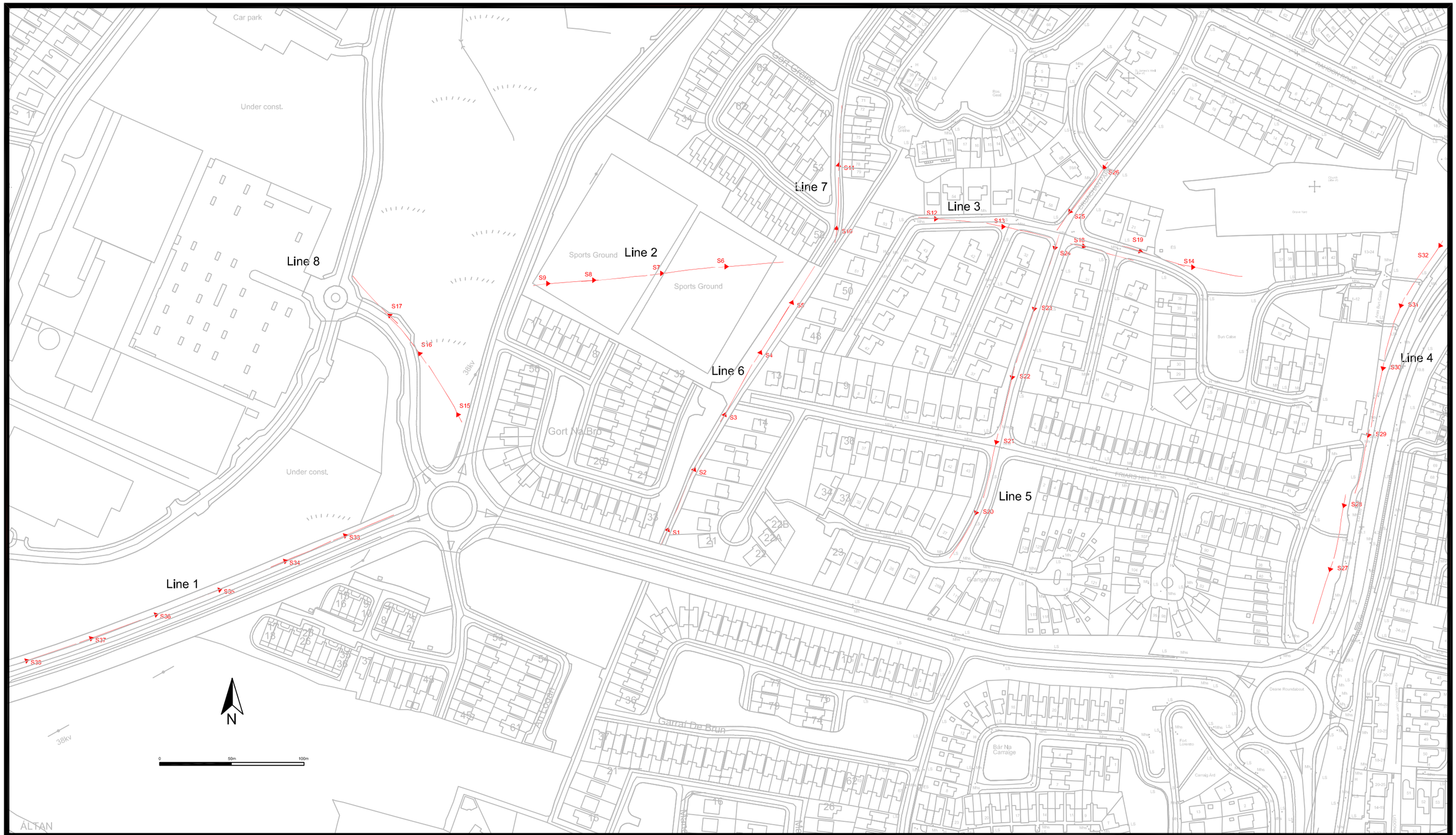
5. REFERENCES

1. **GSEG 2002.** Geophysics in Engineering Investigations. Geological Society Engineering Geology Special Publication 19, London, 2002.

2. **GSI, 1995.** Geology of South Cork. Geological Survey of Ireland 1995.

3. **Milsom, 1989.** Field Geophysics. John Wiley and Sons.

4. **Reynolds, 1997.** An Introduction to Applied and Environmental Geophysics. John Wiley and Son.



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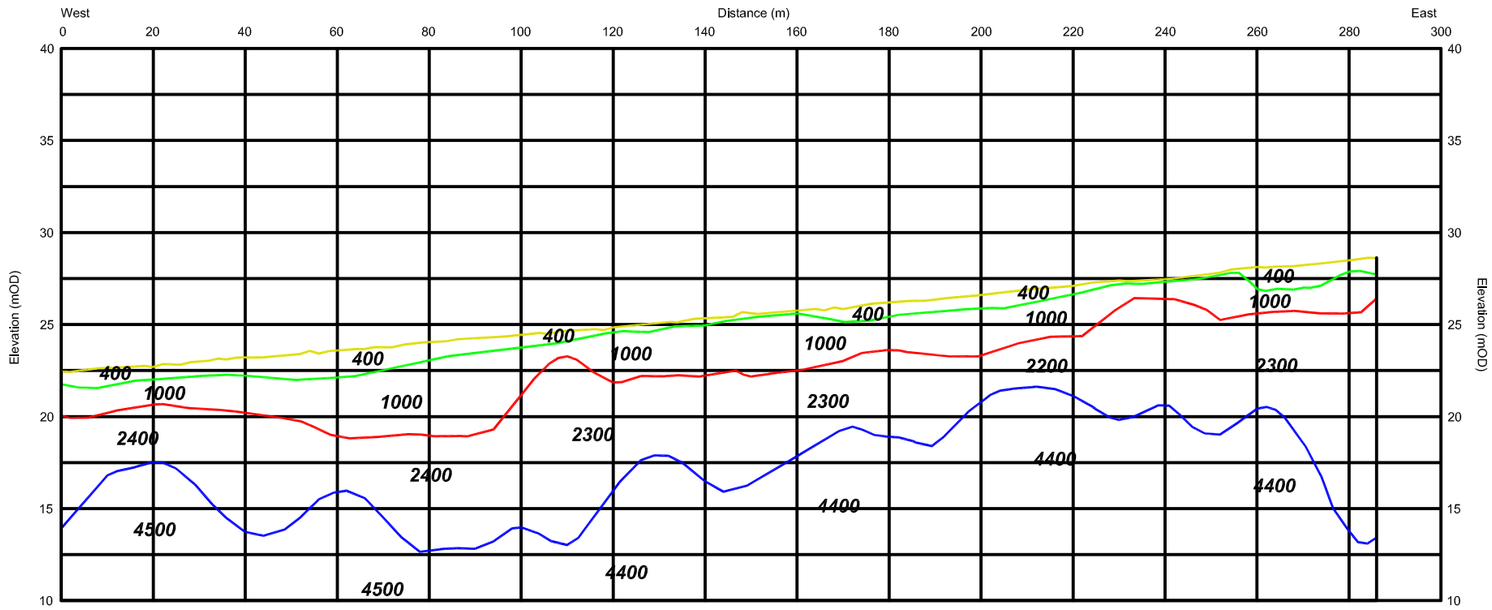
CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Map 1: Geophysical Survey Location Map

SCALE:	1:2500 @ A3
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFigs.dwg
STATUS:	Draft

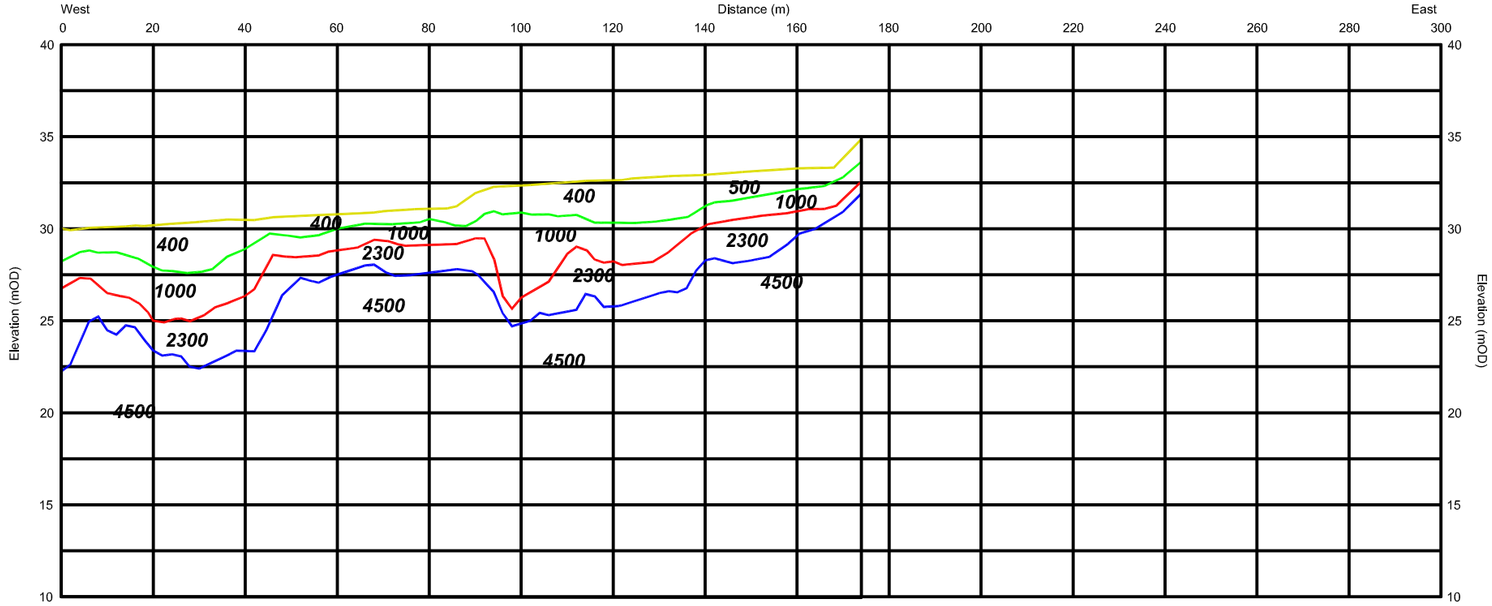
LEGEND:

Seismic Refraction and MASW Profile

Seismic Refraction Line 1 (S38 - S33) Model



Seismic Refraction Line 2 (S9 - S6) Model



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 1a: Models of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

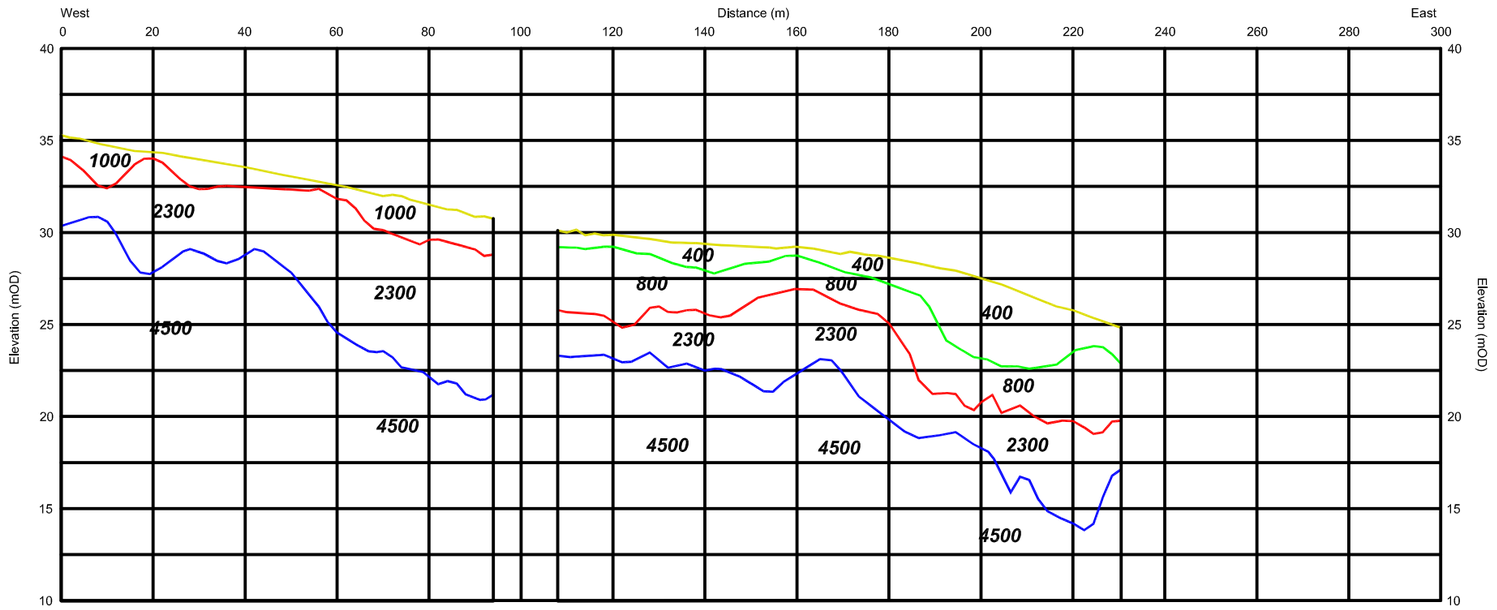
LEGEND:

2200 Average Seismic Velocity in m/s

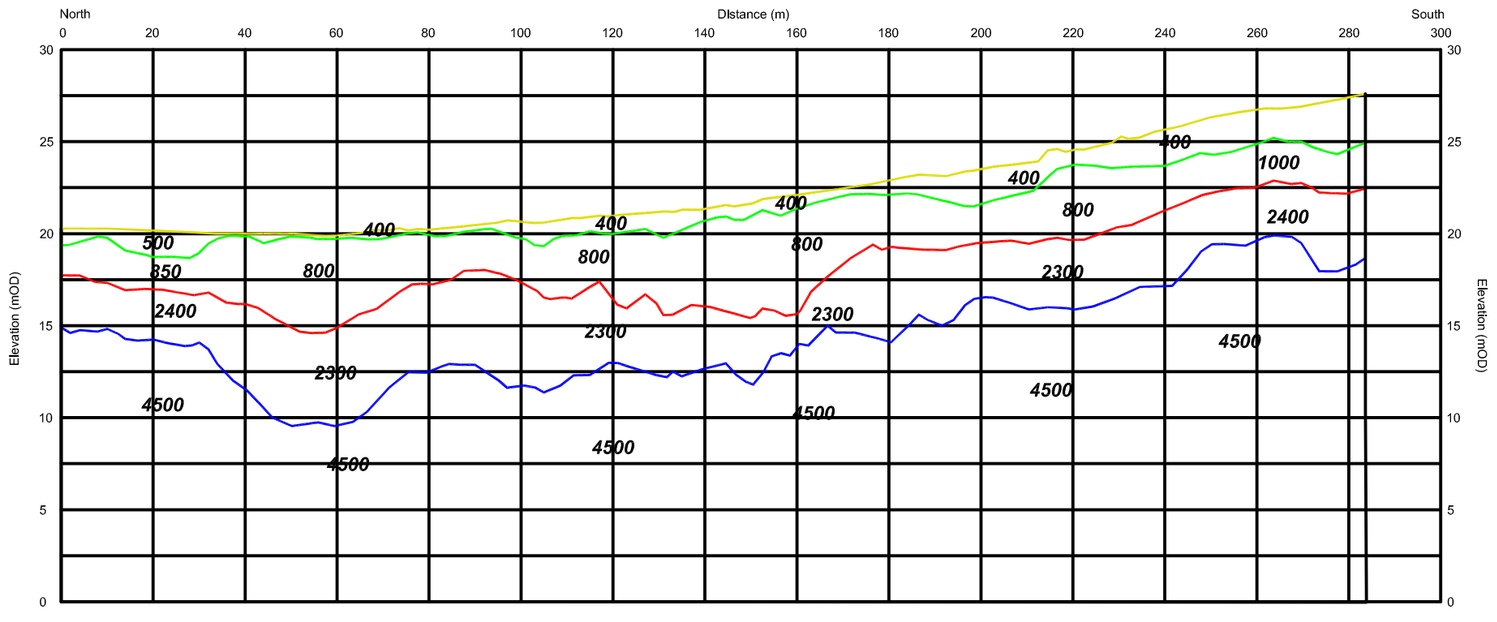
Layers from Seismic Refraction Model:

- Ground Surface/Top of Layer 1 (300 - 500 m/s)
- Top of Layer 2 (800 - 1100 m/s)
- Top of Layer 3 (2200 - 2400 m/s)
- Top of Layer 4 (4400 - 4600 m/s)

Seismic Refraction Line 3 (S12 - S14, S18 - 19) Model



Seismic Refraction Line 4 (S32 - S27) Model



Seismic Refraction Line 5 (S26 - S20) Model

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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 1b: Models of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

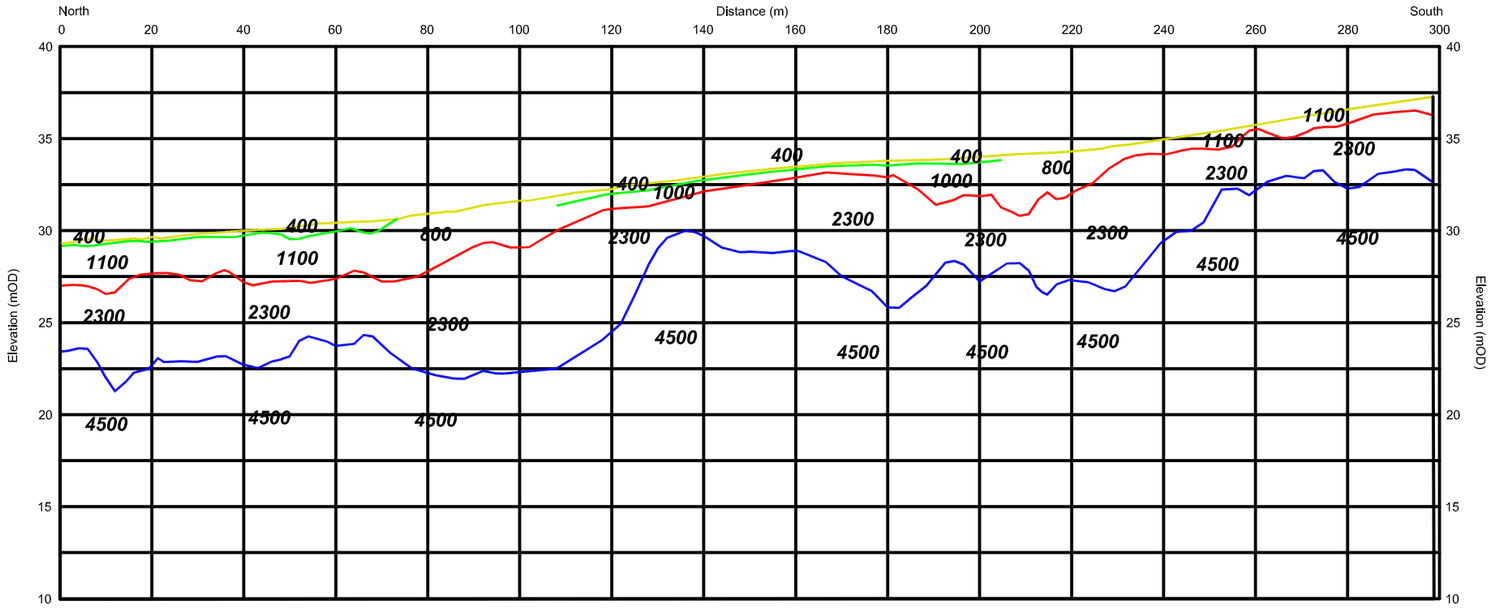
LEGEND:

2200 Average Seismic Velocity in m/s

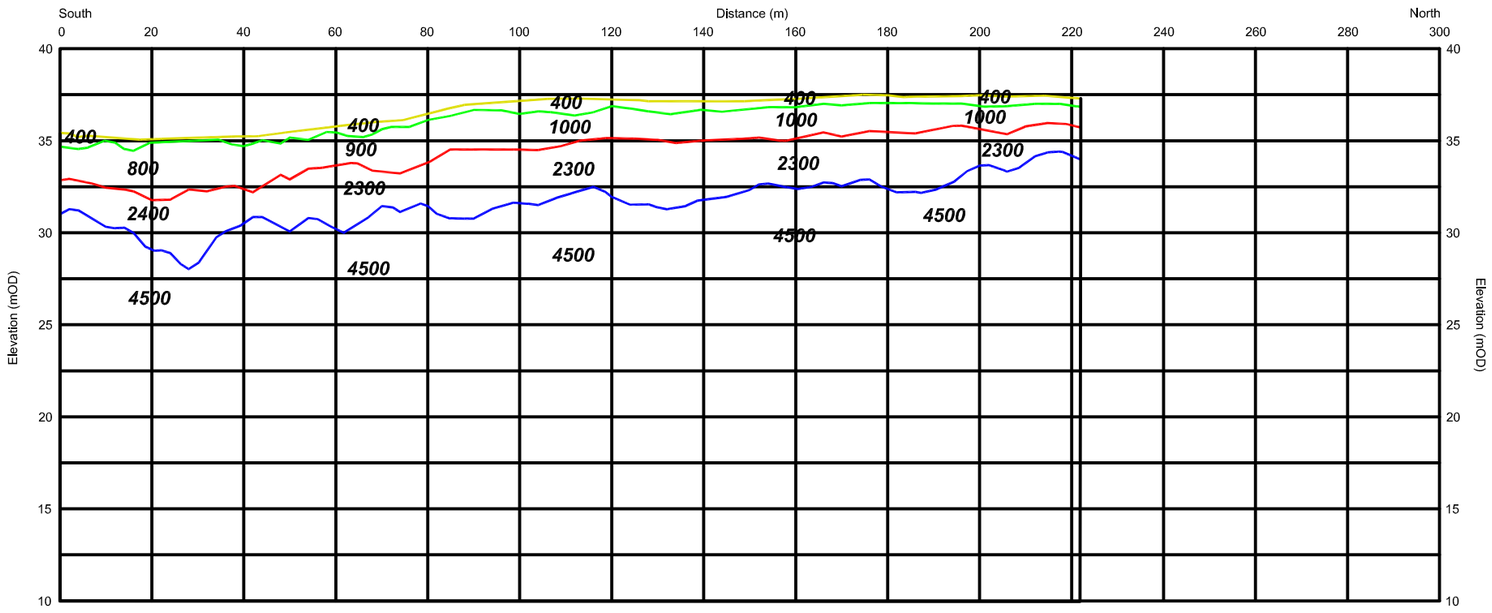
Layers from Seismic Refraction Model:

- Ground Surface/Top of Layer 1 (300 - 500 m/s)
- Top of Layer 2 (800 - 1100 m/s)
- Top of Layer 3 (2200 - 2400 m/s)
- Top of Layer 4 (4400 - 4600 m/s)

Seismic Refraction Line 5 (S26 - S20) Model



Seismic Refraction Line 6 (S1 - S5) Model



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 1c: Models of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

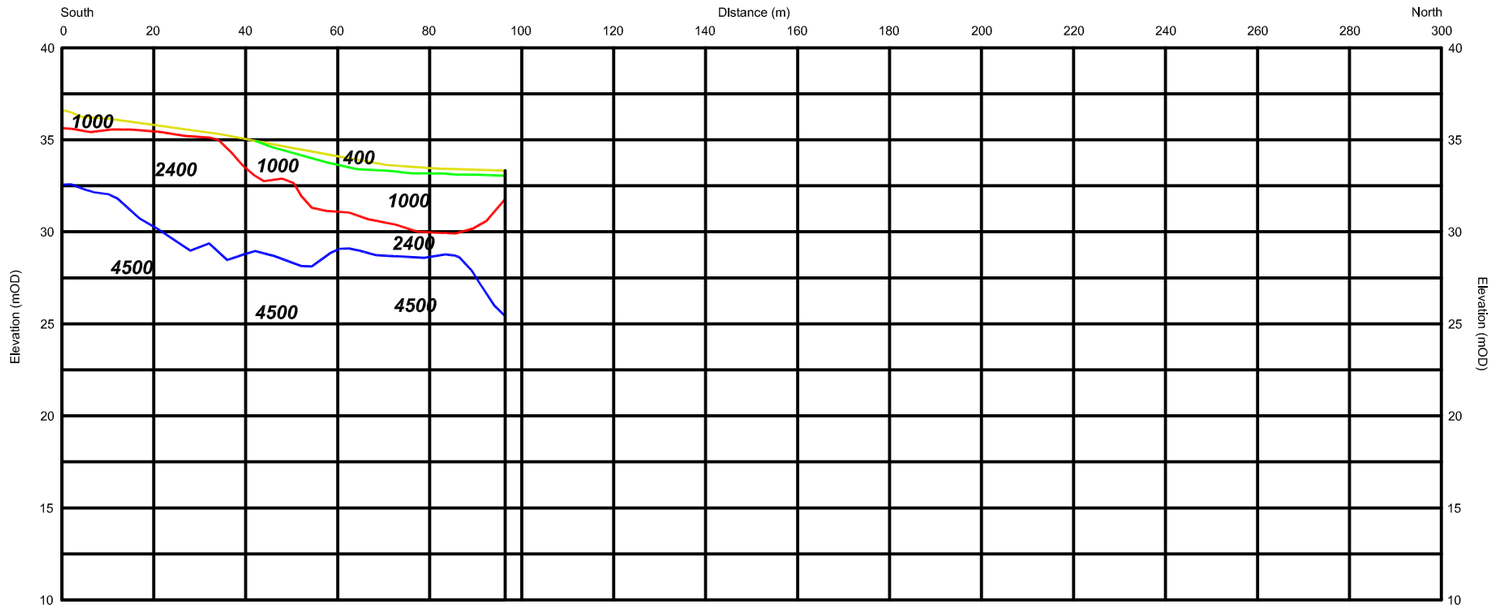
LEGEND:

2200 Average Seismic Velocity in m/s

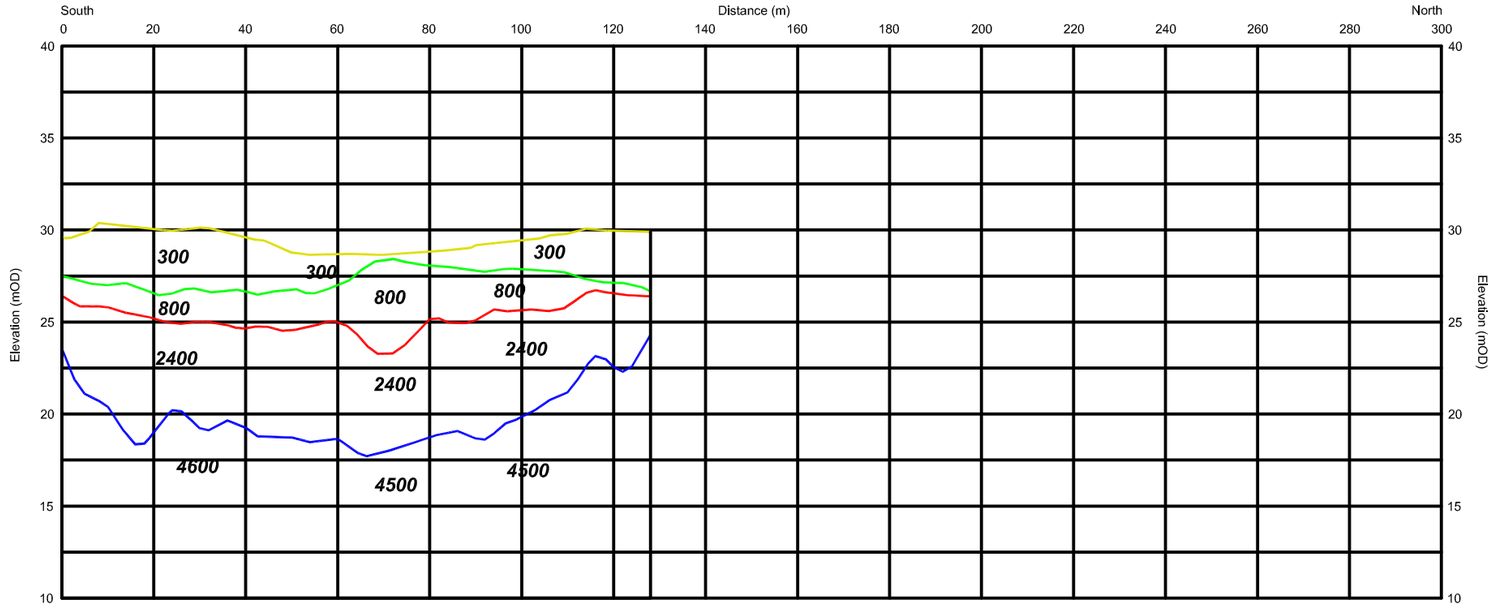
Layers from Seismic Refraction Model:

- Ground Surface/Top of Layer 1 (300 - 500 m/s)
- Top of Layer 2 (800 - 1100 m/s)
- Top of Layer 3 (2200 - 2400 m/s)
- Top of Layer 4 (4400 - 4600 m/s)

Seismic Refraction Line 7 (S10 - S11) Model



Seismic Refraction Line 8 (S15 - S17) Model



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 1d: Models of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

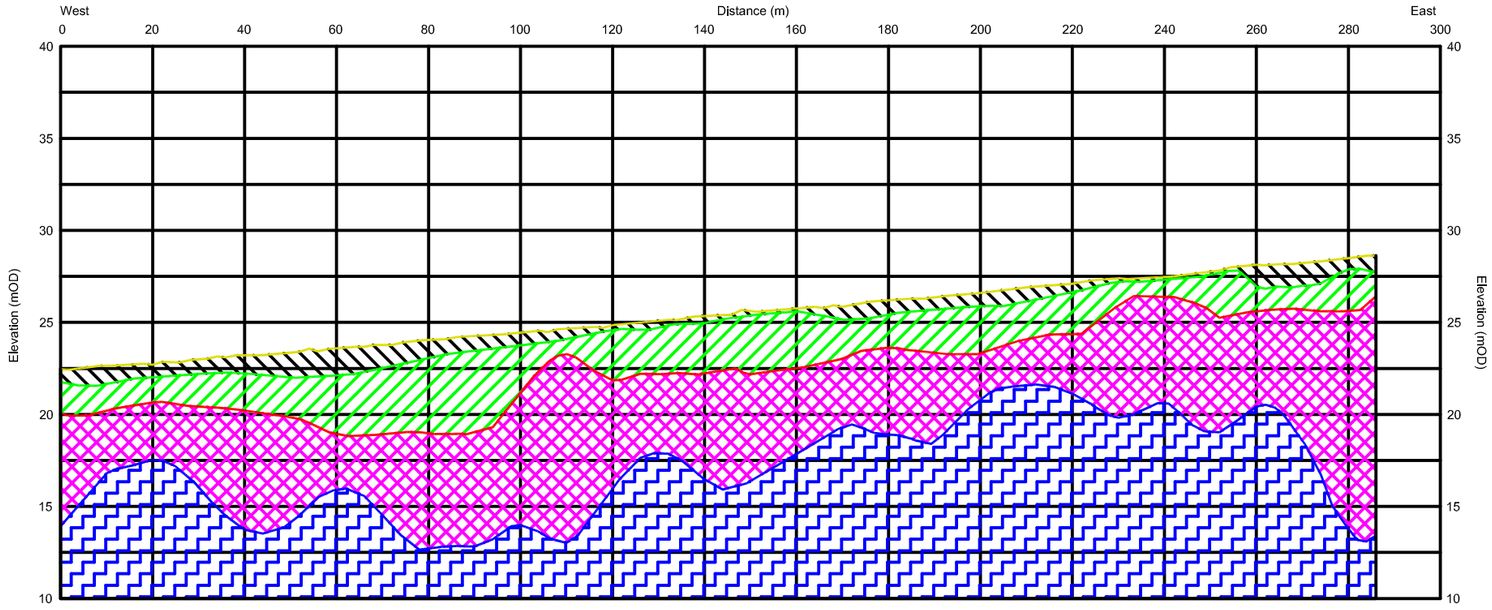
LEGEND:

2200 Average Seismic Velocity in m/s

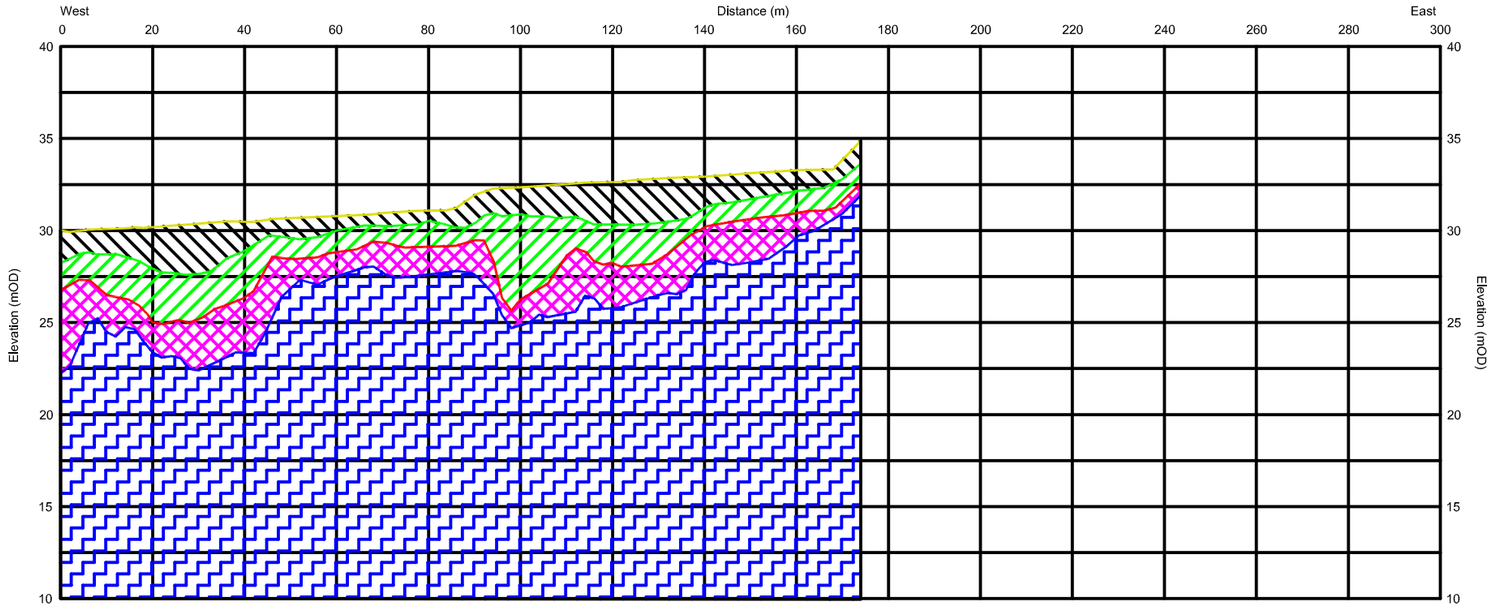
Layers from Seismic Refraction Model:

- Ground Surface/Top of Layer 1 (300 - 500 m/s)
- Top of Layer 2 (800 - 1100 m/s)
- Top of Layer 3 (2200 - 2400 m/s)
- Top of Layer 4 (4400 - 4600 m/s)

Seismic Refraction Line 1 (S38 - S33) Interpretation



Seismic Refraction Line 2 (S9 - S6) Interpretation



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 2a: Interpretation of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

LEGEND:

Integrated Combined Interpretation:

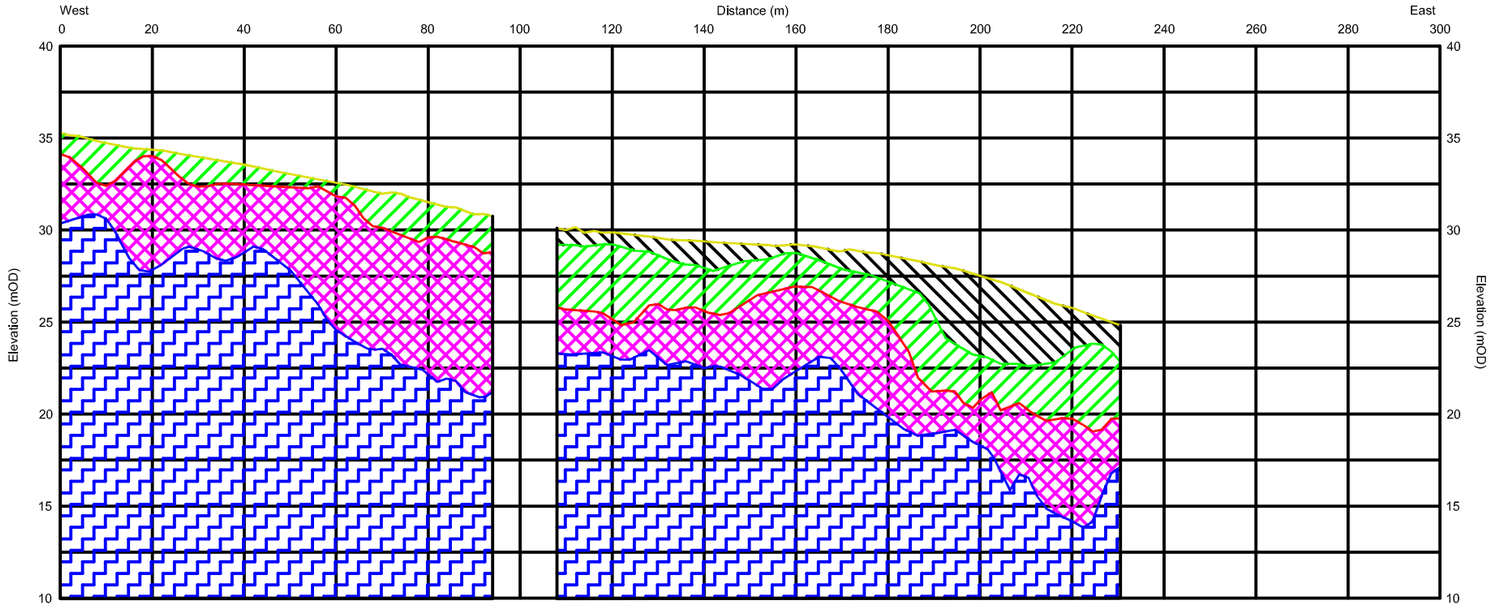
1 Soft/loose Topsoil/Overburden/Pavement Layers

2 Firm to Stiff/Dense Overburden or very weathered Granite

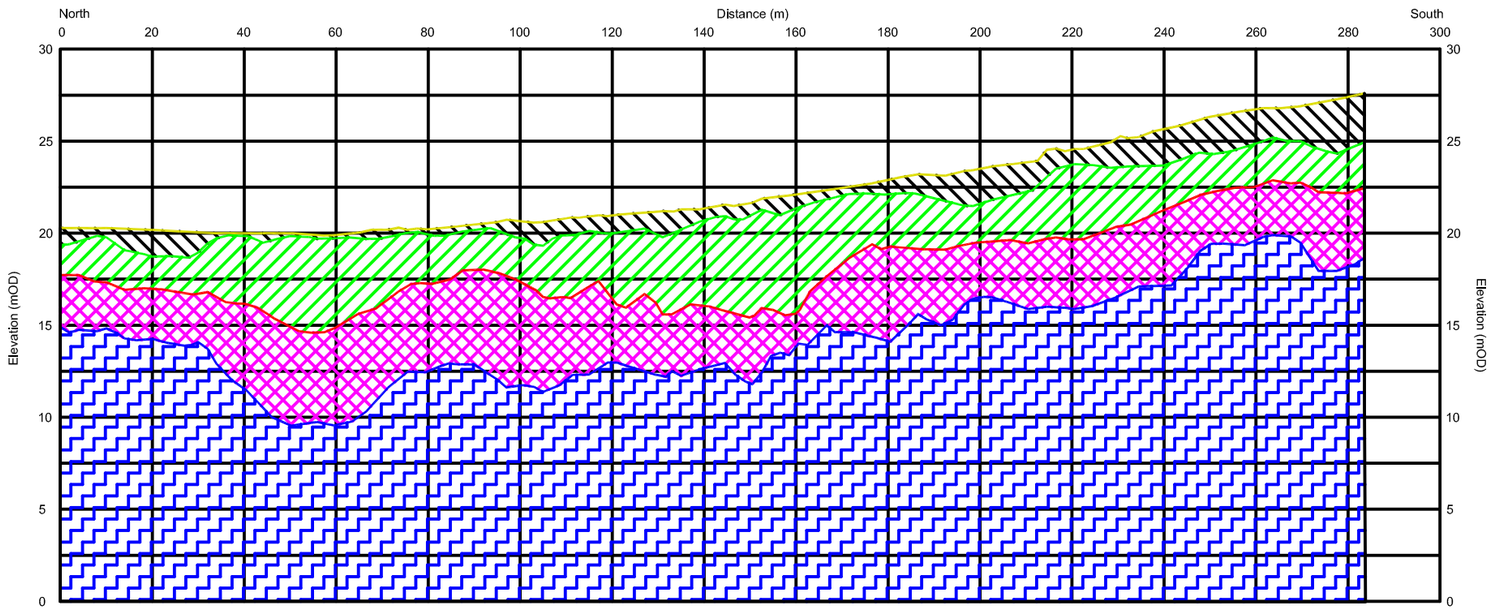
3 Poor to Fair Weathered Granite or hard/very dense Overbruden

4 Strong Granite

Seismic Refraction Line 3 (S12 - S14, S18 - 19) Interpretation



Seismic Refraction Line 4 (S32 - S27) Interpretation



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 2b: Interpretation of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

LEGEND:

Integrated Combined Interpretation:

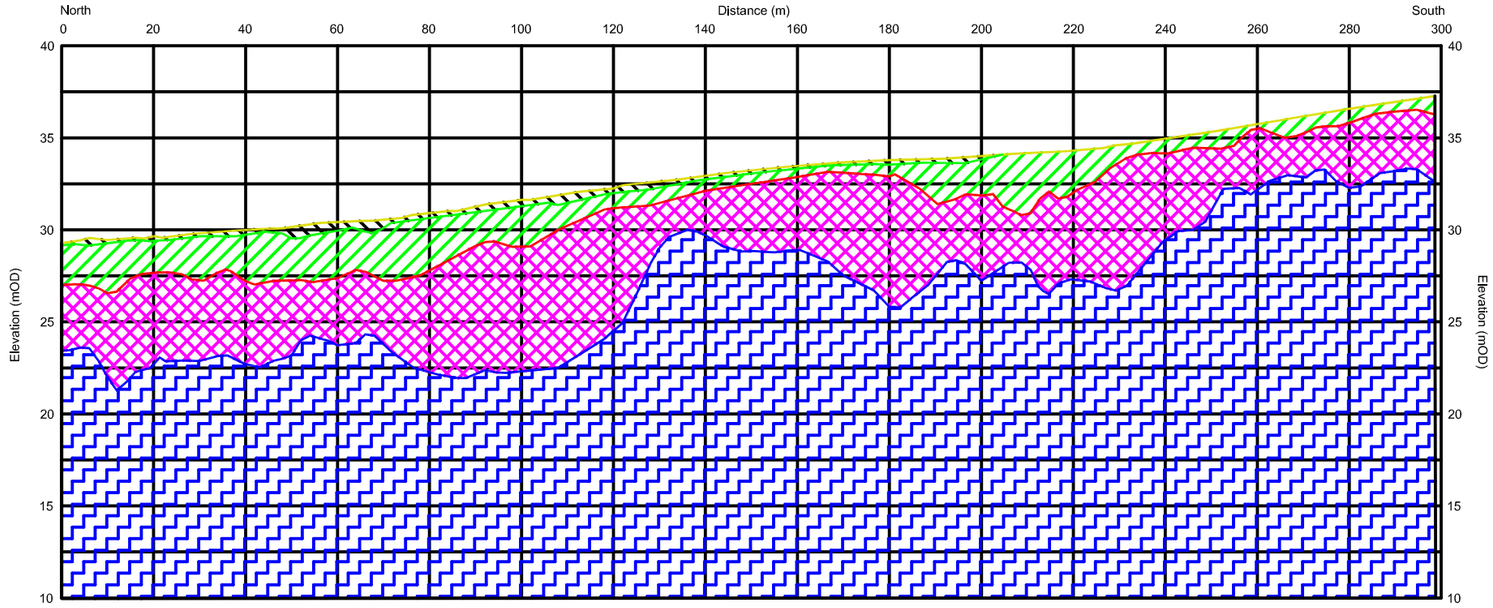
1 Soft/loose Topsoil/Overburden/Pavement Layers

2 Firm to Stiff/Dense Overburden or very weathered Granite

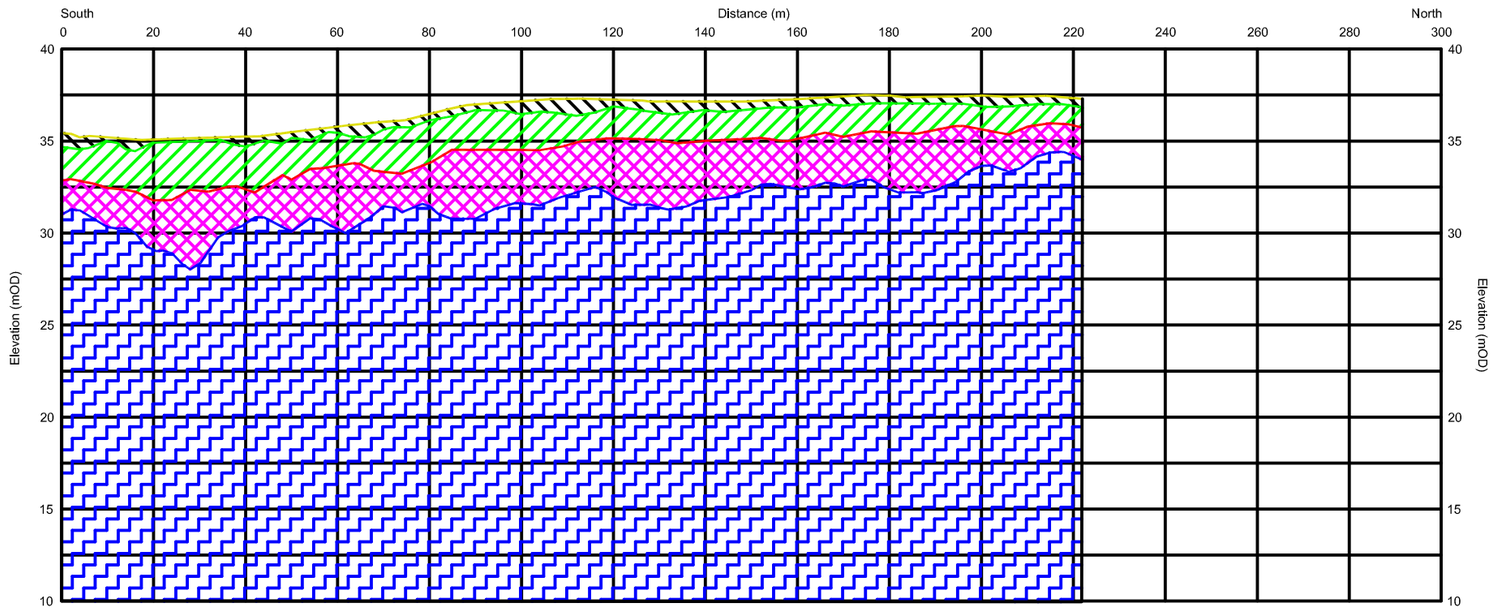
3 Poor to Fair Weathered Granite or hard/very dense Overbruden

4 Strong Granite

Seismic Refraction Line 5 (S26 - S20) Interpretation



Seismic Refraction Line 6 (S1 - S5) Interpretation



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 2c: Interpretation of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

LEGEND:

Integrated Combined Interpretation:

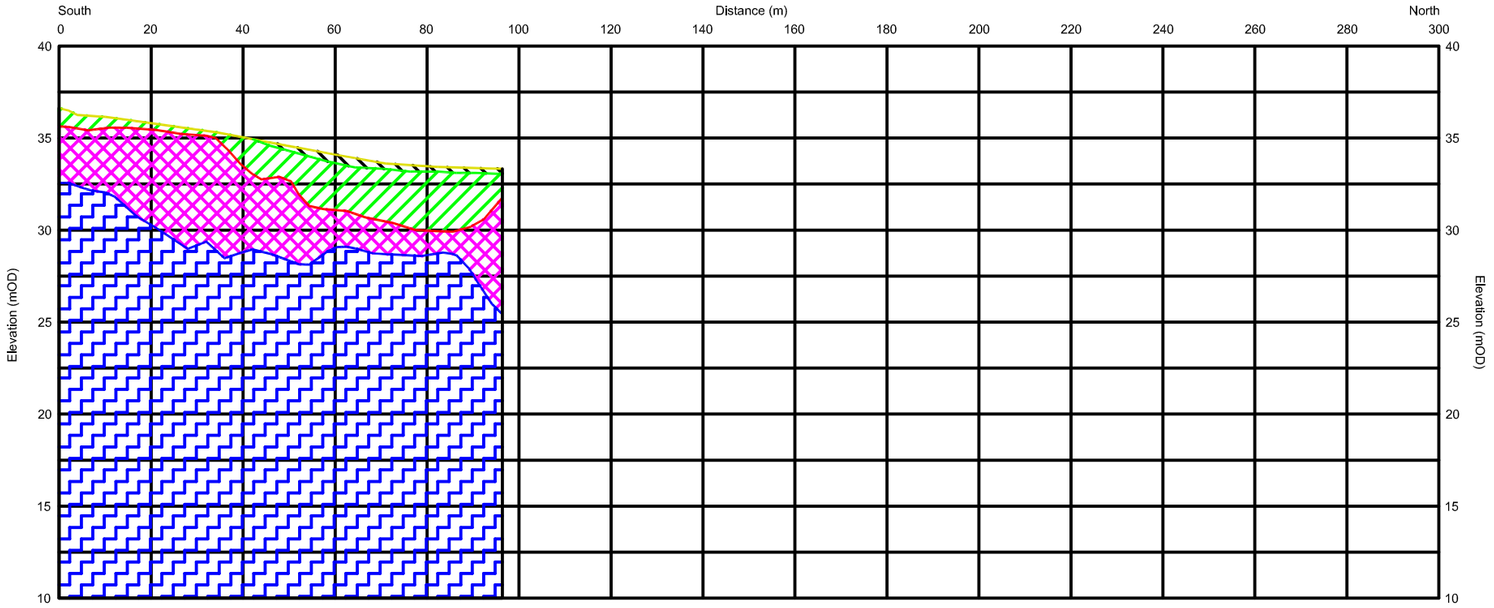
1 Soft/loose Topsoil/Overburden/Pavement Layers

2 Firm to Stiff/Dense Overburden or very weathered Granite

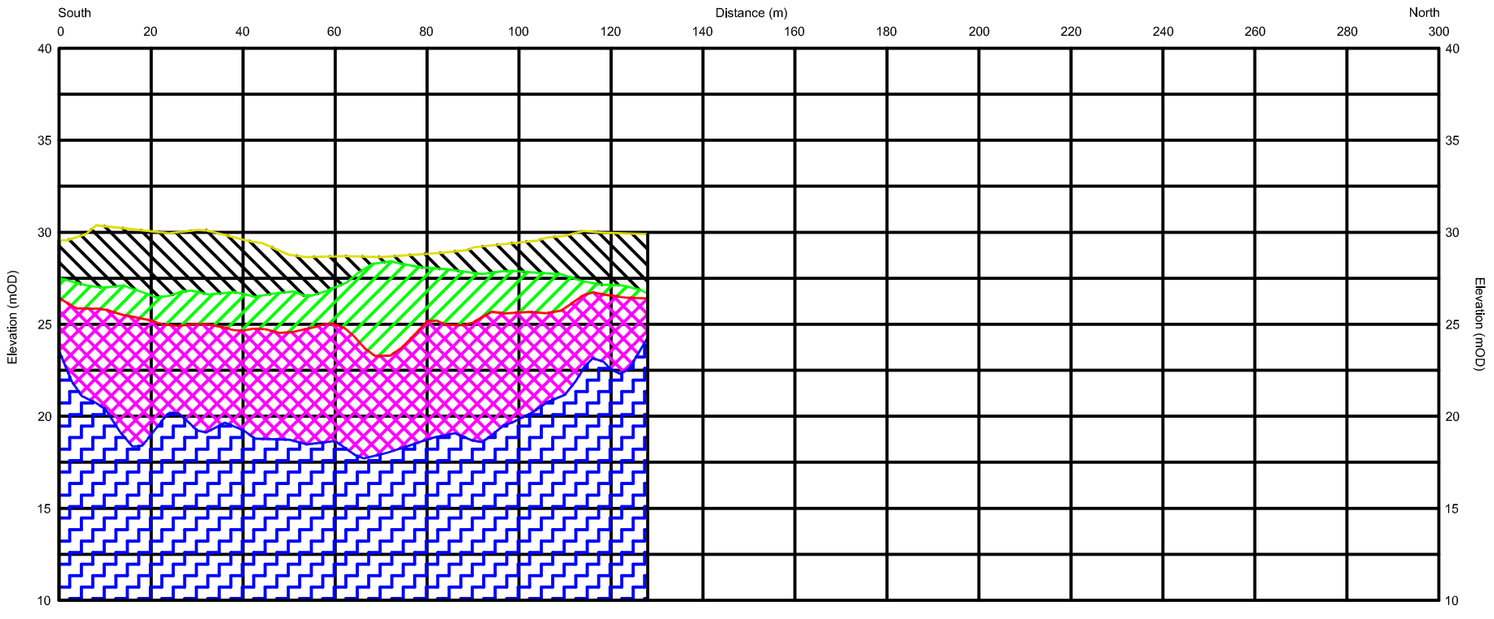
3 Poor to Fair Weathered Granite or hard/very dense Overbruden

4 Strong Granite

Seismic Refraction Line 7 (S10 - S11) Interpretation



Seismic Refraction Line 8 (S15 - S17) Interpretation



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CLIENT	Irish Drilling Ltd.
PROJECT	Galway City Outer Bypass Phase 1 Geophysical Survey
TITLE	Figure 2d: Interpretation of Geophysical Survey

SCALE:	NTS, V.E. 1:4
PROJECT:	5820
DRAWN:	RJ
DATE:	14/07/2014
MGX FILE:	5820d_MapsFig.dwg
STATUS:	Draft

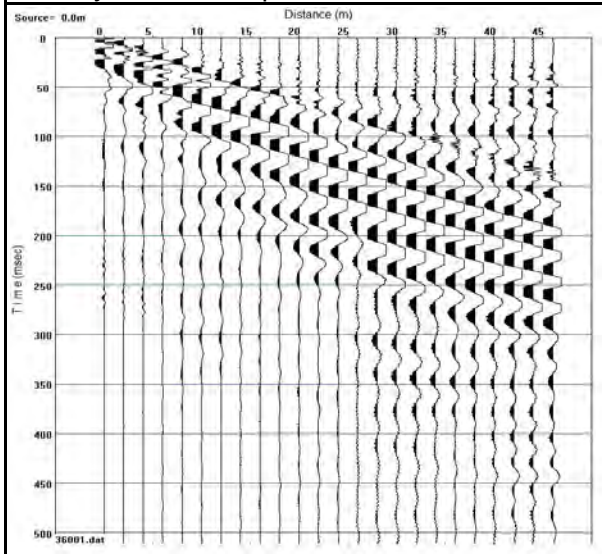
LEGEND:

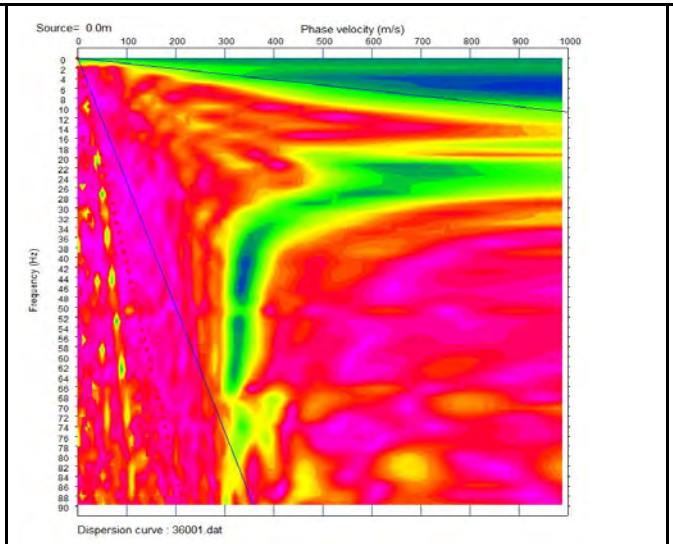
Integrated Combined Interpretation:

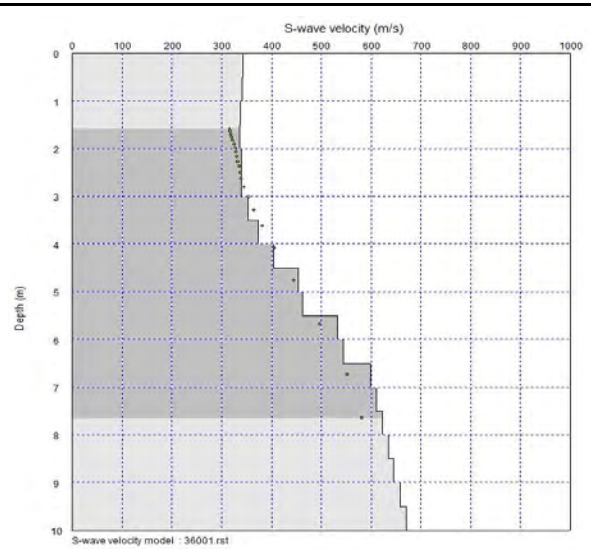
1 Soft/loose Topsoil/Overburden/Pavement Layers
2 Firm to Stiff/Dense Overburden or very weathered Granite
3 Poor to Fair Weathered Granite or hard/very dense Overbruden
4 Strong Granite

Appendix A: Results of MASW Survey

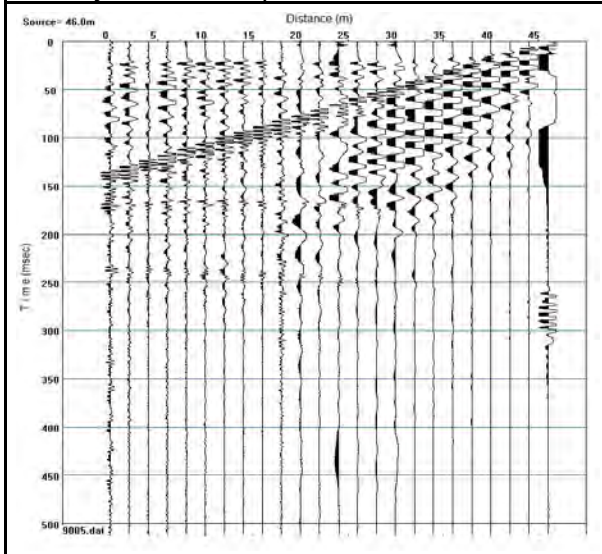
MASW Results from Line 1, Profile 36, Shot 1. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

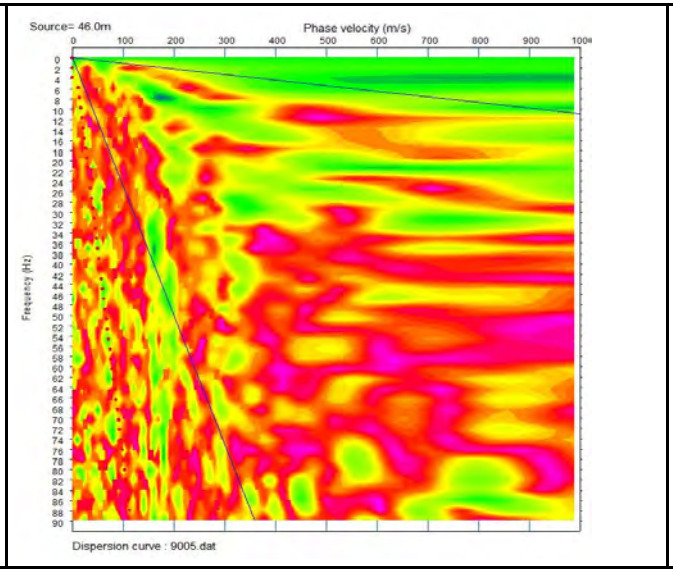


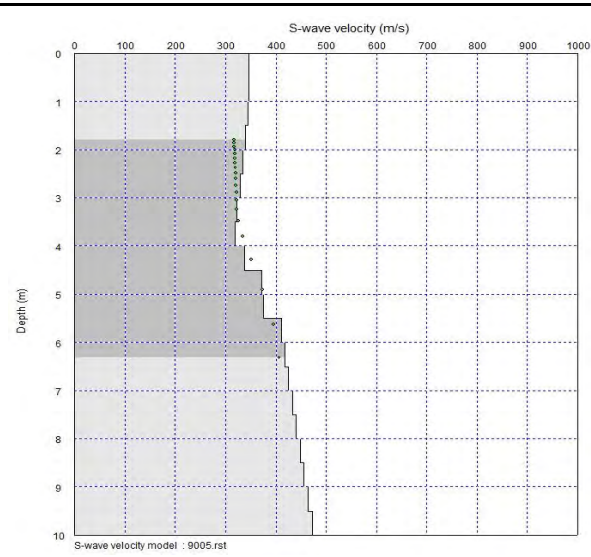




MASW Results from Line 2, Profile 9, Shot 5. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

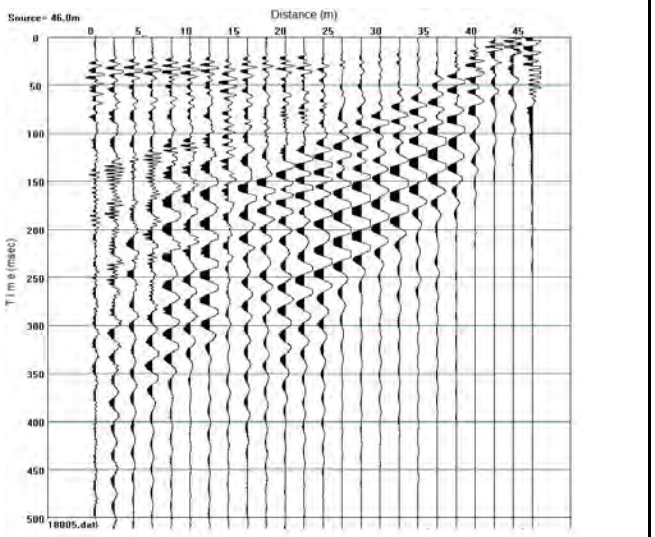


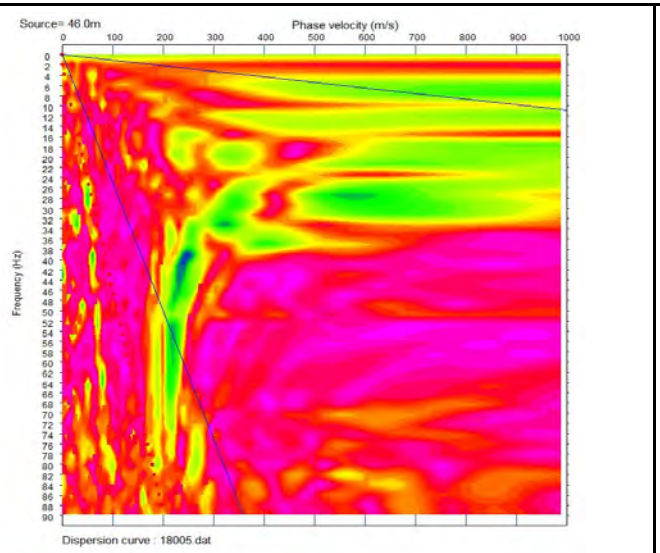


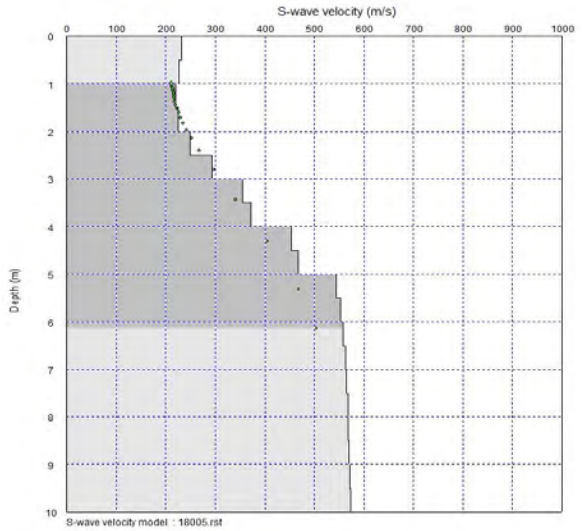


Appendix A: Results of MASW Survey

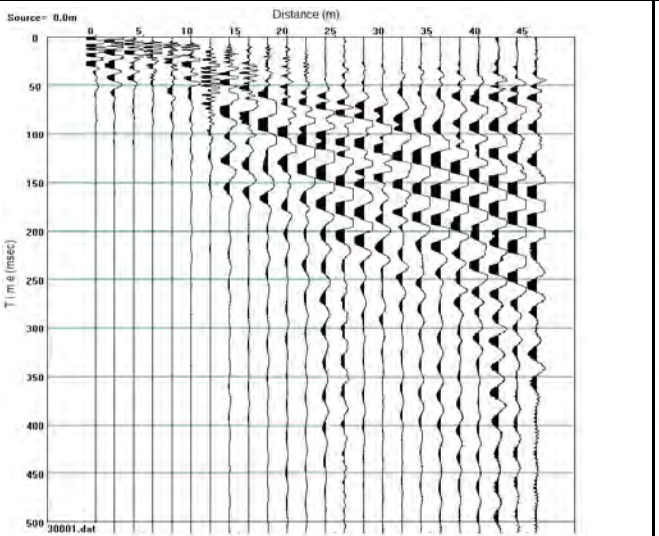
MASW Results from Line 3, Profile 18, Shot 5. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

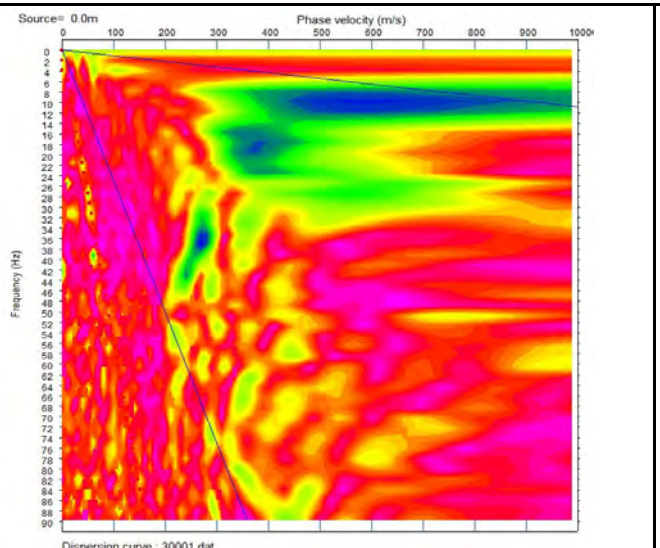


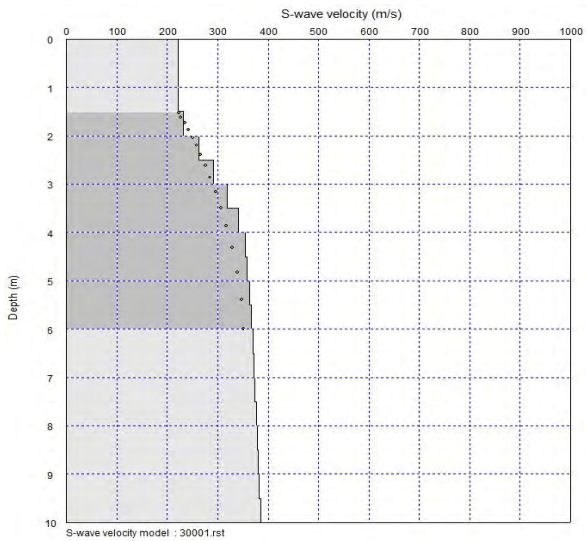




MASW Results from Line 4, Profile 30, Shot 1. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

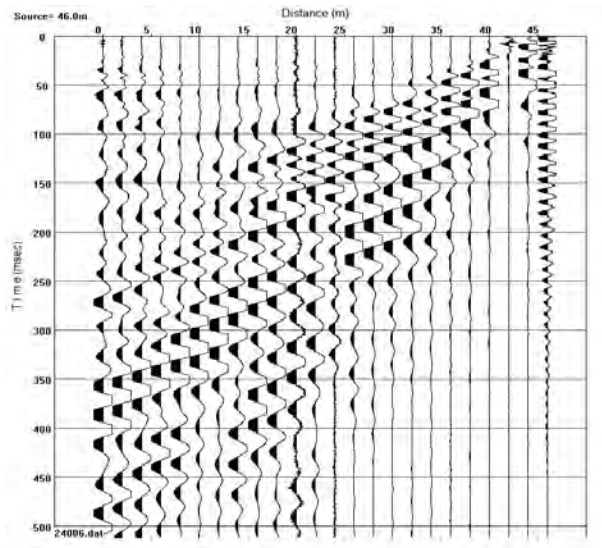


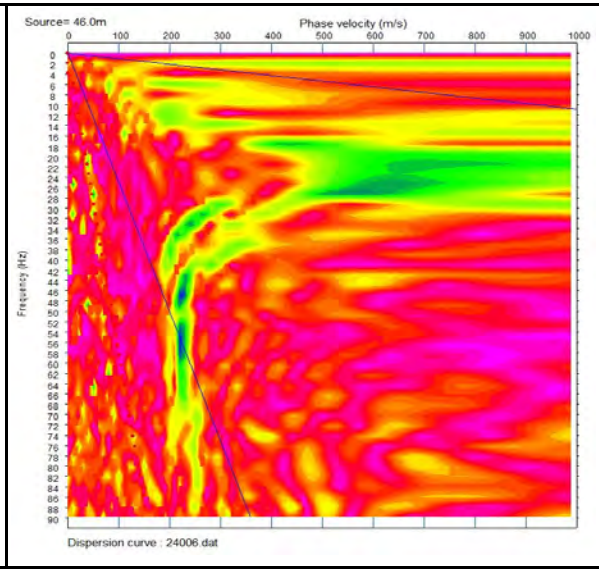


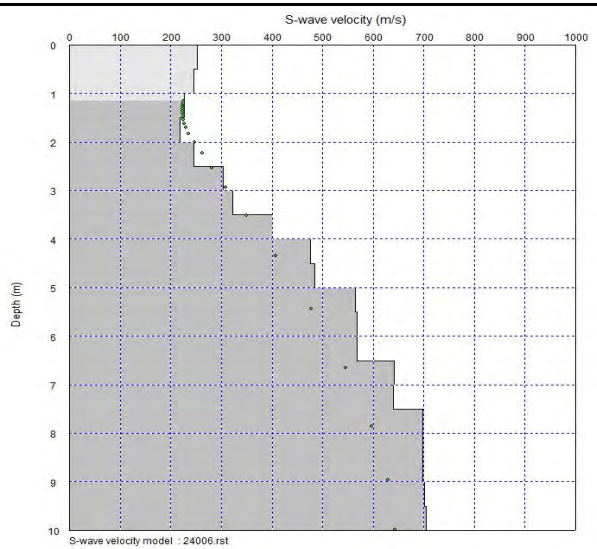


Appendix A: Results of MASW Survey

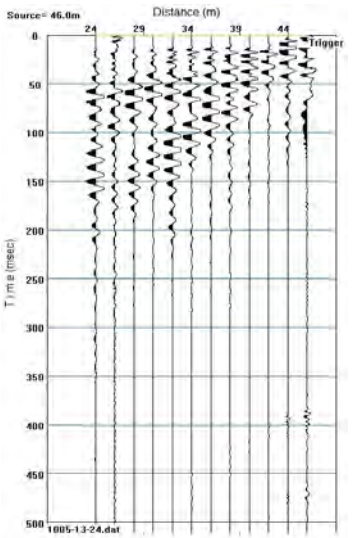
MASW Results from Line 5, Profile 24, Shot 6. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

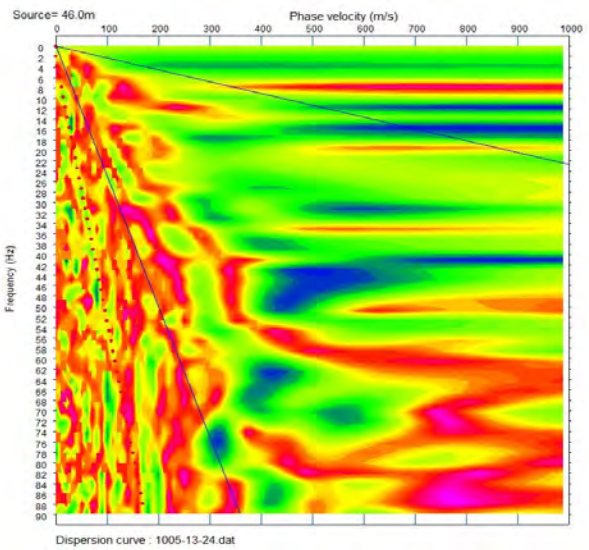


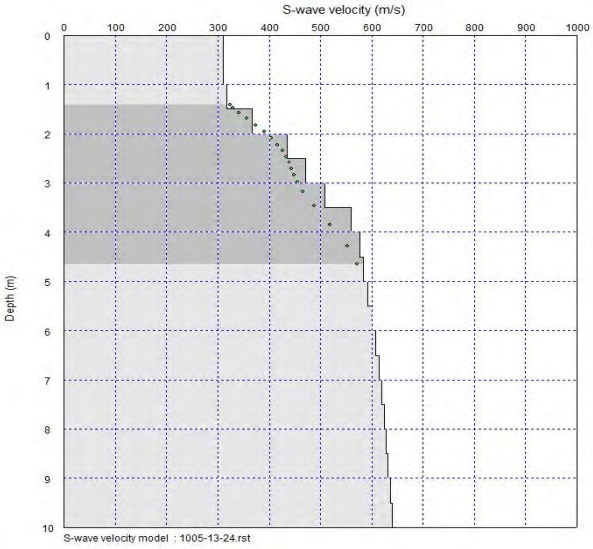




MASW Results from Line 6, Profile 1, Shot 5, Traces 13-24. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

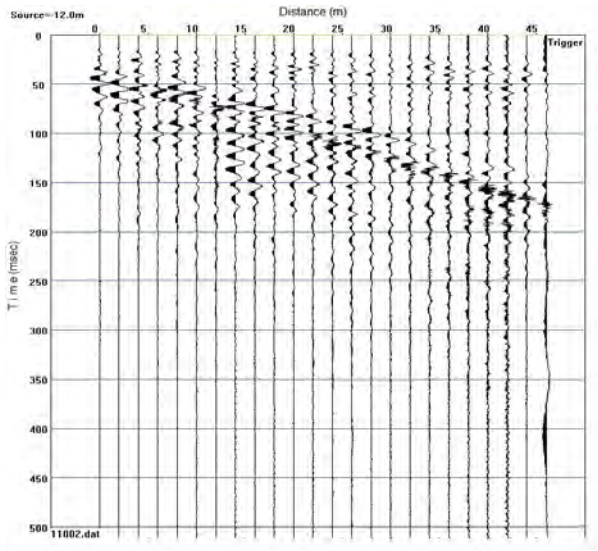


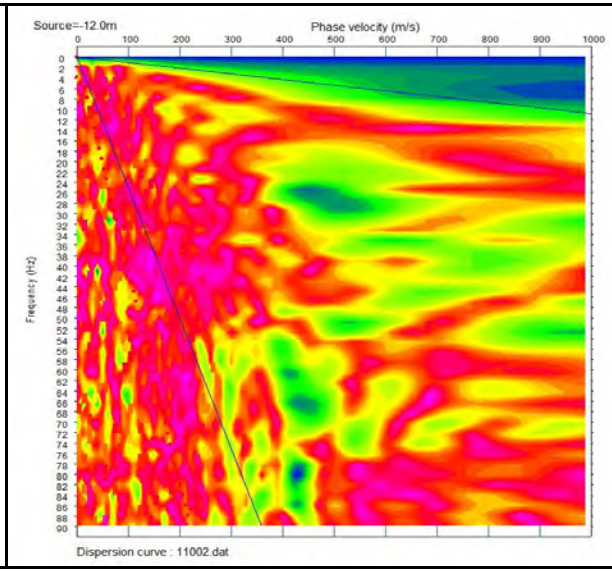


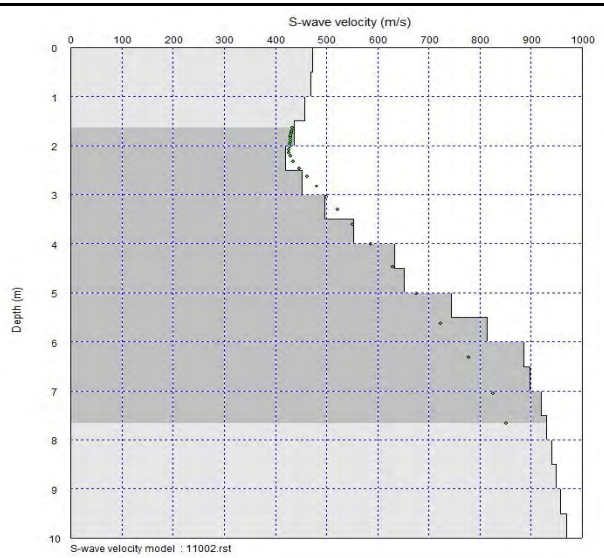


Appendix A: Results of MASW Survey

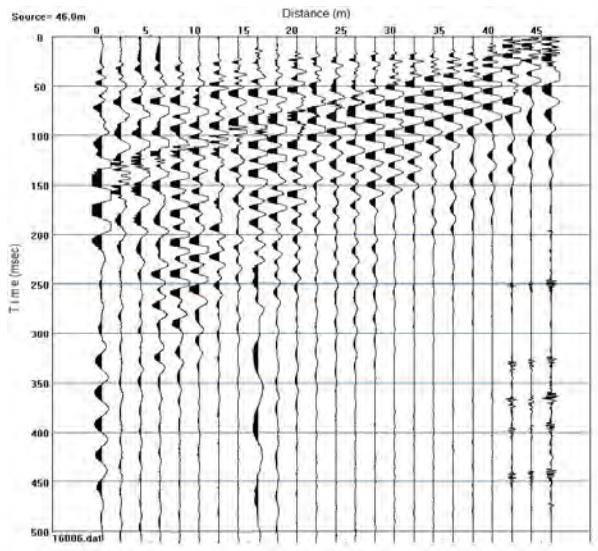
MASW Results from Line 7, Profile 11, Shot 2. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.

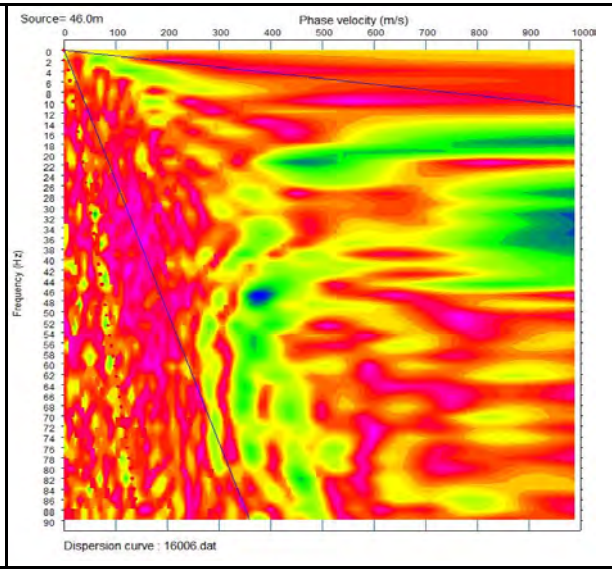


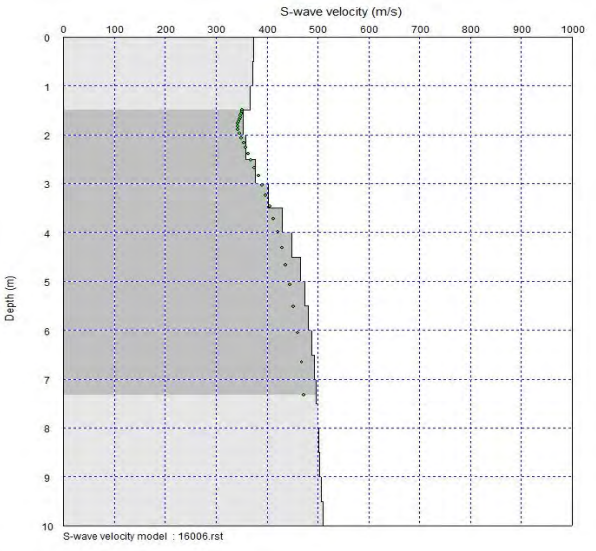




MASW Results from Line 8, Profile 16, Shot 6. From left to right images show the seismic shot record, the dispersion curve and the shear wave velocity - versus depth model.







Appendix A.9.1.3

Phase 2 Contract 1, N6 Galway City Transport Project Phase 2 Ground Investigation Contract 1, October 2015 to November 2015

IGSL Ltd

N6 Galway City Transport Project – Phase 2 Ground Investigation Contract 1

Factual Report

Project No. 18746

November 2015

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DOCUMENT ISSUE REGISTER

Distribution	Report Status	Revision	Date of Issue	Prepared By:	Approved By:
ARUP	DRAFT PDF by email	A	19 November 2015	John Lawler BSc MSc P.Geo. EurGeol FGS	Paul Quigley BEng CEng CGeol MIEI MICE FGS
ARUP	PDF by email	B	25 November 2015	John Lawler BSc MSc P.Geo. EurGeol FGS	Paul Quigley BEng CEng CGeol MIEI MICE FGS

A1

FOR INFORMATION

Legend:

Borehole Location

RC-2-01 (533347.458, 728184.956)

RC-2-02 (533685.056, 728091.771)

RC-2-03 (533774.883, 728026.062)

RC-2-04 (533961.296, 727895.577)

Eastát Tionscail na Páirce Mhóire

Parkmore West Business and Technology Park

Area under construction

Racecourse Business Park

Ballybrit Race Track

Lisheen Grave Yard

Souterrains (site of)

Car Park

Pond

Borehole Coordinates		
Name	Position X	Position Y
RC-02-01	533347.458	728184.956
RC-02-02	533685.056	728091.771
RC-02-03	533774.883	728026.062
RC-02-04	533961.296	727895.577

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Disclaimer Note:
The constraints and options shown are draft only and subject to change. More detailed assessments, on-going studies and the information received from the public may result in changes to these constraints.

Clients

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Job Title
N6 Galway City Transport Project

Scale 1:1250 @ A1

Date: Nov 2015

I1	11/11/2015	GOD	MH	EMC
Issue	Date	By	Chkd	Appd

Drawing Title
Phase 2 Ground Investigation Works Galway Racecourse

Drawing Status
For Information

Job No	Drawing No	Issue
233985-00	**GCOB-SK-D-113**	**I1**

Do not scale

© Arup

Appendix 1

Rotary Core Drillhole Records and Photographs

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RC02/01**
SHEET Sheet 1 of 2

CO-ORDINATES 533,347.51 E
728,184.96 N
GROUND LEVEL (mOD) 56.63

RIG TYPE Knebel
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 80

DATE DRILLED 12/11/2015
DATE LOGGED 16/11/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY IGSL
LOGGED BY K.Kinsella

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay.				
1	1.50								1.50	55.13		
	1.60	30	0	0				Strong to very strong, medium to thickly bedded, light to dark grey, locally very fractured, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to moderately weathered(1.50-1.60m, 11.71-12.18m, 12.25-12.37m) with slight solution weathering.				
2	2.90	100	100	92				Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally undulose. Apertures are tight to moderately open, brown clay light smearing, calcite veined(10mm), iron-oxide stained. Dips are sub-horizontal (vertical fractures 11.43-11.65m, 12.8-12.24m).				
3	3.30	125	125	125								
	3.75	89	89	89								
	4.00	100	92	92								
4	4.20	100	100	100								
	4.84	100	100	80								
	5.00	100	100	100								
5	5.33	100	100	100								
	6.00	100	100	100		670						
6		98	94	94		540						
	7.00											
7	7.40	100	100	100								
	7.77	100	100	100								
8	8.95	100	97	80		549.9999999999999						
9	9.70	100	97	97								
		93	93	91								

REMARKS

Hole cased 0.00-1.50m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RC02/01**
SHEET Sheet 2 of 2

CO-ORDINATES 533,347.51 E
728,184.96 N
GROUND LEVEL (mOD) 56.63

RIG TYPE Knebel
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 80

DATE DRILLED 12/11/2015
DATE LOGGED 16/11/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY IGSL
LOGGED BY K.Kinsella

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.15	100	100	100		539.999999999999		Strong to very strong, medium to thickly bedded, light to dark grey, locally very fractured, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to moderately weathered(1.50-1.60m, 11.71-12.18m, 12.25-12.37m) with slight solution weathering. Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally undulose. Apertures are tight to moderately open, brown clay light smearing, calcite veined(10mm), iron-oxide stained. Dips are sub-horizontal (vertical fractures 11.43-11.65m, 12.8-12.24m). *(continued)*				
	10.70											
11		100	70	65								
12	12.20											
	12.50	100	60	60					12.50	44.13		
13		100	98	95		550.000000000001		Strong to very strong, medium to thickly bedded, light to dark grey/black, locally very fractured, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to moderately weathered(15.07-15.24m). Discontinuities are wide to closely spaced, smooth to locally rough, planar to very locally undulose. Apertures are tight to moderately open, dark brown clay and dark grey gravel and clay infill, brown clay smearing, calcite veined(10mm). Dips are sub-horizontal.				
	13.70											
14		100	99	99								
	14.80											
	14.90	100	100	100								
15		91	88	72								
16	16.20											
		100	83	76								
	16.95											
17		100	100	100								
	17.45											
		100	100	98		530.000000000001						
18	18.30											
19		100	100	100								
	19.80								19.80	36.83		
								End of Borehole at 19.80 m				

REMARKS

Hole cased 0.00-1.50m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RC02/02**
		SHEET	Sheet 1 of 2
CO-ORDINATES	533,684.92 E 728,102.47 N	**DATE DRILLED**	16/10/2015
GROUND LEVEL (mOD)	54.92	**DATE LOGGED**	20/10/2015
CLIENT	Galway County Council	**DRILLED BY**	IGSL
ENGINEER	ARUP	**LOGGED BY**	K.Kinsella
RIG TYPE	Knebel		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	80		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
								SYMMETRIX DRILLING: No recovery- Driller reports MADE GROUND consisting of gravel.	0.50	54.42		
								SYMMETRIX DRILLING: No recovery- Driller reports sandy cobbly clay.	1.50	53.42		
								SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay.	6.00	48.92		
	6.00											
	6.50	52	0	0				Gravel and Cobbles - Possible weathered rock	6.50	48.42		
	7.30	0	0	0				SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay - possible weathered rock	7.30	47.62		
	7.90	95	43	43				Strong to very strong, thick to very thinly bedded, light to dark grey, fine to medium grained, LIMESTONE (localised chert and stylolites), fresh to moderately weathered (7.38-7.50m, 8.75-9.16m) with slight solution weathered. Discontinuities are medium to closely spaced, rough to locally smooth, planar to locally undulose. Apertures are tight to moderately open, clayed and gravel filled, locally calcite veined (5mm). Dips are sub-horizontal with very locally vertical.				
	8.75	100	46	38								
	9.30	100	29	29								
	9.60	100	53	33								
	9.85	100	100	68								

REMARKS

Hole cased 0.00-7.30m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
20-10-15	19.90	12.00	19.90	50mm SP

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RC02/02**
		SHEET	Sheet 2 of 2
CO-ORDINATES	533,684.92 E 728,102.47 N	**DATE DRILLED**	16/10/2015
GROUND LEVEL (mOD)	54.92	**DATE LOGGED**	20/10/2015
CLIENT	Galway County Council	**DRILLED BY**	IGSL
ENGINEER	ARUP	**LOGGED BY**	K.Kinsella
RIG TYPE	Knebel		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	80		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10		99	97	90	650			Strong to very strong, thick to very thinly bedded, light to dark grey, fine to medium grained, LIMESTONE (localised chert and stylolites), fresh to moderately weathered (7.38-7.50m, 8.75-9.16m) with slight solution weathered. Discontinuities are medium to closely spaced, rough to locally smooth, planar to locally undulose. Apertures are tight to moderately open, clayed and gravel filled, locally calcite veined (5mm). Dips are sub-horizontal with very locally vertical. *(continued)*				
11	11.00	100	95	52								
	11.80	100	84	69								
12	12.25	100	87	69								
13	13.75	100	49	49								
14	14.50	100	80	80								
	14.75	98	79	63								
15	15.85	100	97	82								
16												
17	17.35	100	96	59								
18	18.25	100	100	75								
	18.85	97	73	61								
19	19.90							End of Borehole at 19.90 m	19.90	35.02		

REMARKS

Hole cased 0.00-7.30m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
20-10-15	19.90	12.00	19.90	50mm SP

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RC02/03**
		SHEET	Sheet 1 of 2
CO-ORDINATES	533,774.69 E 728,024.34 N	**DATE DRILLED**	12/10/2015
GROUND LEVEL (mOD)	53.89	**DATE LOGGED**	14/10/2015
RIG TYPE	Knebel		
FLUSH	Air/Mist		
CLIENT	Galway County Council	**DRILLED BY**	IGSL
ENGINEER	ARUP	**LOGGED BY**	K.Kinsella
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	80		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery- Driller reports sandy clay with occasional gravel.				
1									1.20	52.69		
								SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay.				
2												
3												
4	4.50								4.50	49.39		
	5.00	40	0	0				Firm, light to dark brown, sandy CLAY. Sand is fine to coarse.				
5		27	0	0								
6	6.50								6.50	47.39		
	7.00	0	0	0				SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay - possible weathered rock	7.00	46.89		
7	7.60	67	25	25				Strong to very strong, thick to very thinly bedded, light to dark grey,locally very fractured (7.00-7.60m, 9.10-9,20m), with a light brown clay infill, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to locally moderately weathered (9.20-9.53m, 12.28-12.71m).				
8		100	91	91		540.000000000001		Discontinuities are wide to closely spaced, rough, planar to locally undulose. Apertures are tight to moderately open, stiff light to dark brown sand and clay infill, locally calcite veined (2-15mm) and iron-oxide stained. Dips are sub-horizontal, two vertical (18.30-18.60m and 18.93-19.34m).				
9	9.10 9.20	100	0	0								
		100	80	75								

REMARKS

Hole cased 0.00-6.00m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RC02/03**
		SHEET	Sheet 2 of 2
CO-ORDINATES	533,774.69 E 728,024.34 N	**DATE DRILLED**	12/10/2015
GROUND LEVEL (mOD)	53.89	**DATE LOGGED**	14/10/2015
CLIENT	Galway County Council	**DRILLED BY**	IGSL
ENGINEER	ARUP	**LOGGED BY**	K.Kinsella
RIG TYPE	Knebel		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	80		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Description
10	10.60				Strong to very strong, thick to very thinly bedded, light to dark grey,locally very fractured (7.00-7.60m, 9.10-9,20m), with a light brown clay infill, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to locally moderately weathered (9.20-9.53m, 12.28-12.71m). Discontinuities are wide to closely spaced, rough, planar to locally undulose. Apertures are tight to moderately open, stiff light to dark brown sand and clay infill, locally calcite veined (2-15mm) and iron-oxide stained. Dips are sub-horizontal, two vertical (18.30-18.60m and 18.93-19.34m). *(continued)*
11	11.30	100	76	50	
	11.80	100	100	100	
12	12.20	95	70	70	
	12.80	83	30	0	
13	13.15	100	71	71	
	13.80	100	74	57	
14	14.30	100	96	96	
15	15.30	93	91	91	
16	16.80	97	97	92	
17	17.10	83	80	63	
	18.30	96	92	89	
18	18.60	93	93	93	
19	20.00	94	89	86	

Fracture Spacing Log (mm): 0 – 250 – 500

Non-intact Zone

Legend

Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20.00	33.89		

REMARKS

Hole cased 0.00-6.00m

End of Borehole at 20.00 m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RC02/04**
		SHEET	Sheet 1 of 3
CO-ORDINATES	533,966.82 E 727,889.85 N	**DATE DRILLED**	14/10/2015
GROUND LEVEL (mOD)	52.27	**DATE LOGGED**	14/10/2015
CLIENT	Galway County Council	**DRILLED BY**	IGSL
ENGINEER	ARUP	**LOGGED BY**	K.Kinsella
RIG TYPE	Knebel		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	80		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery- Driller reports sandy clay.				
1									1.80	50.47		
2								SYMMETRIX DRILLING: No recovery- Driller reports sandy gravelly clay.				
3												
4									4.80	47.47		
5	5.40							SYMMETRIX DRILLING: No recovery- Driller reports limestone.	5.40	46.87		
6	6.00	100	95	67				Strong to very strong, medium to very thinly bedded, light to dark grey, locally very fractured, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to locally slightly weathered with slight solution weathering. Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally undulose. Apertures are tight to moderately open,very firm mottled brown/grey clay infill (10.67-10.90m), calcite veined(1mm), iron-oxide stained. Dips are sub-horizontal to very locally sub-vertical.				
	6.64	100	97	80								
7	7.55	99	91	86								
8	8.20	100	100	82								
	8.95	97	93	75								
9		100	97	89								

REMARKS

Hole cased 0.00-5.40m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RC02/04**
SHEET Sheet 2 of 3

CO-ORDINATES 533,966.82 E
727,889.85 N
GROUND LEVEL (mOD) 52.27

RIG TYPE Knebel
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 80

DATE DRILLED 14/10/2015
DATE LOGGED 14/10/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY IGSL
LOGGED BY K.Kinsella

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.45							Strong to very strong, medium to very thinly bedded, light to dark grey, locally very fractured, fine to medium grained, LIMESTONE (localised stylolites and chert), fresh to locally slightly weathered with slight solution weathering. Discontinuities are medium to closely spaced, smooth to locally rough, planar to locally undulose. Apertures are tight to moderately open,very firm mottled brown/grey clay infill (10.67-10.90m), calcite veined(1mm), iron-oxide stained. Dips are sub-horizontal to very locally sub-vertical. *(continued)*				
	10.90	100	33	33								
11	11.95	100	94	88								
12	13.45	100	97	93								
13	14.95	100	99	80								
14	16.00	96	95	90								
15	16.45	100	100	100								
16	17.95	97	93	93								
17	18.25	100	100	100								
18	19.45	100	100	100		870.000000000001						
19												

REMARKS
Hole cased 0.00-5.40m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RC02/04**
SHEET Sheet 3 of 3

CO-ORDINATES 533,966.82 E
727,889.85 N
GROUND LEVEL (mOD) 52.27

RIG TYPE Knebel
FLUSH Air/Mist
INCLINATION (deg) -90
CORE DIAMETER (mm) 80

DATE DRILLED 14/10/2015
DATE LOGGED 14/10/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY IGSL
LOGGED BY K.Kinsella

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20		100	85	57								
	20.60								20.60	31.67		
								End of Borehole at 20.60 m				
21												
22												
23												
24												
25												
26												
27												
28												
29												

REMARKS
Hole cased 0.00-5.40m

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL RC FI 10M 18746.GPJ IGSL.GDT 19/11/15

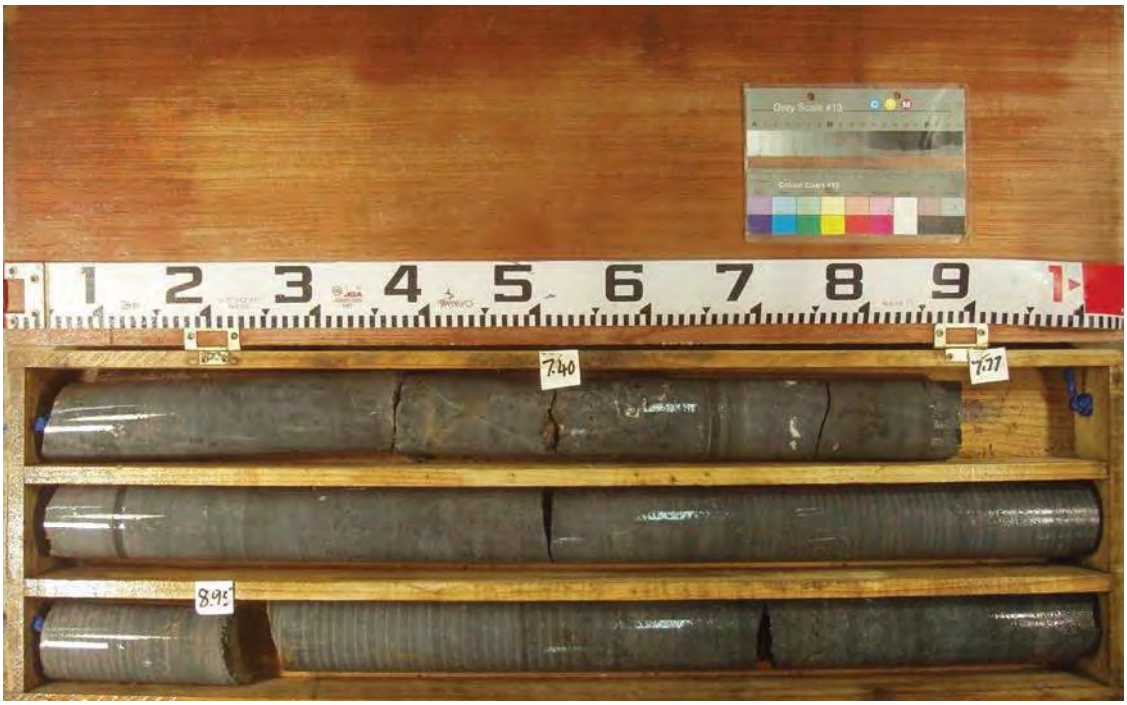
18746- N6 Galway Transport Project

RC02/01 Box 1 (1.50-4.20m)

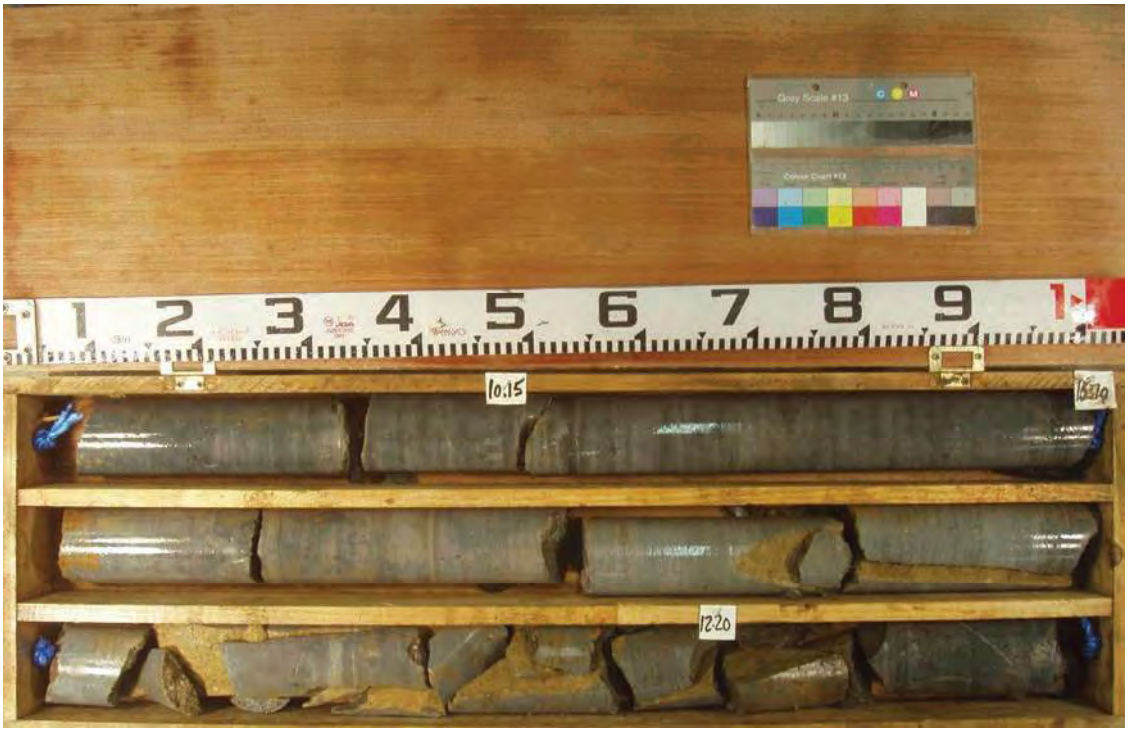
RC02/01 Box 2 (4.20-7.00m)

IGSL LTD.

RC02/01 Box 3 (7.00-9.70m)

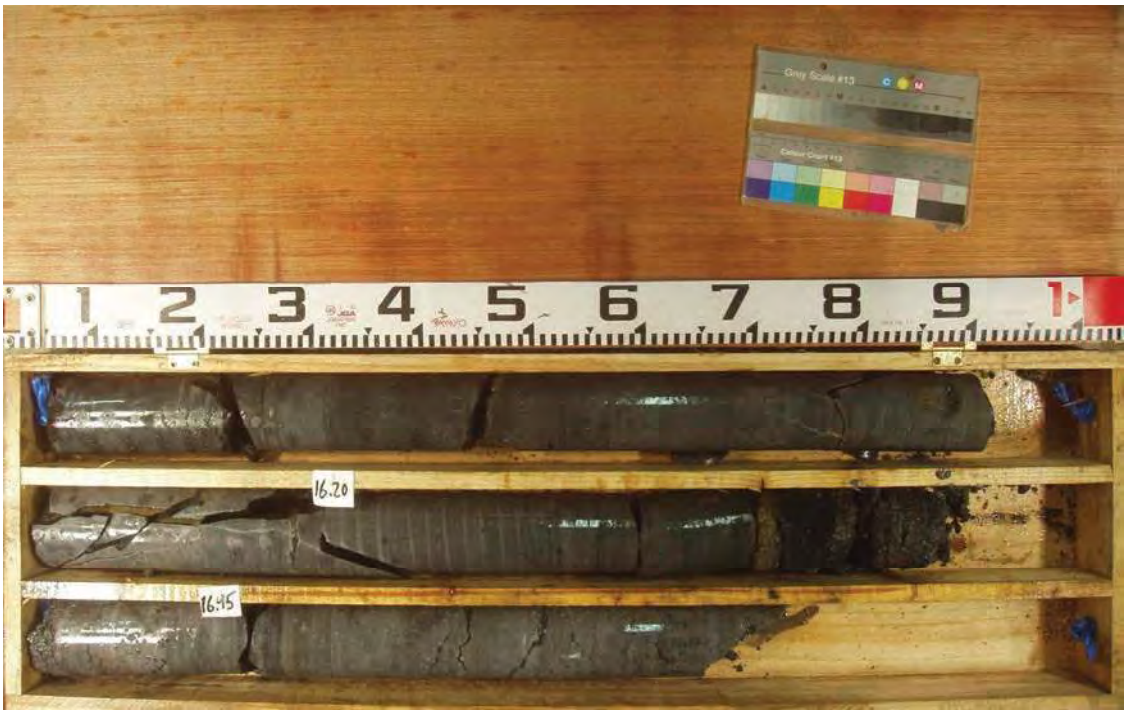


RC02/01 Box 4 (9.70-12.50m)



RC02/01 Box 5 (12.50-14.90m)

RC02/01 Box 6 (14.90-17.45m)



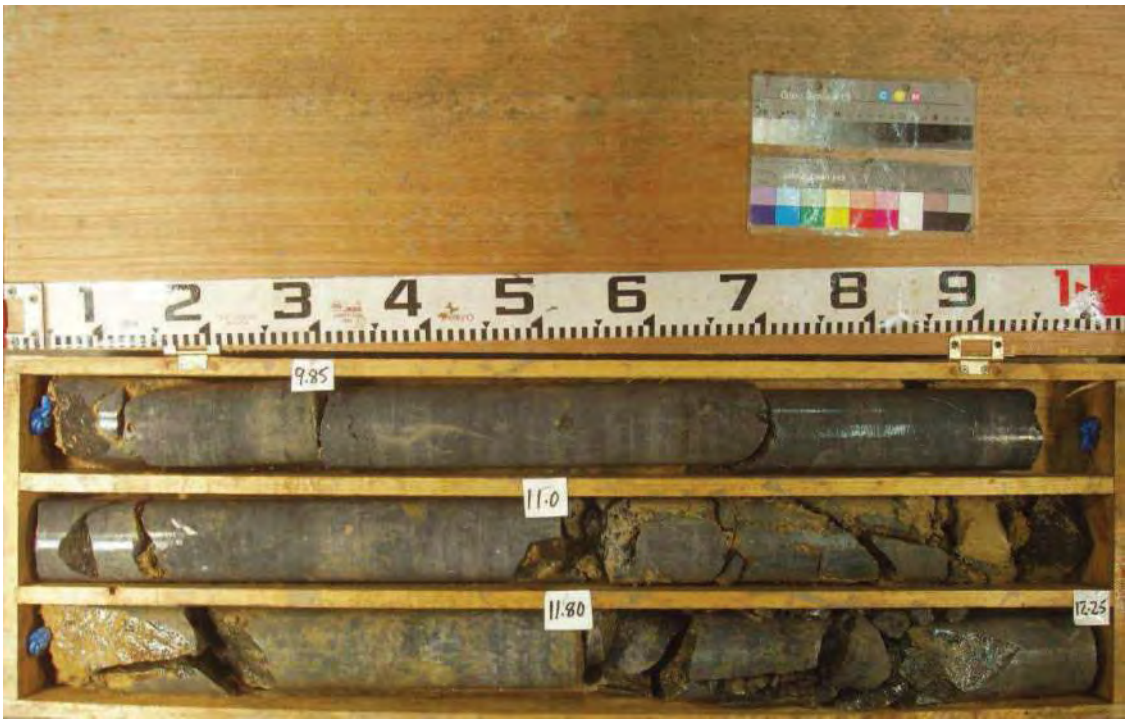
18746- N6 Galway Transport Project

RC02/01 Box 7 (17.45-19.80m)

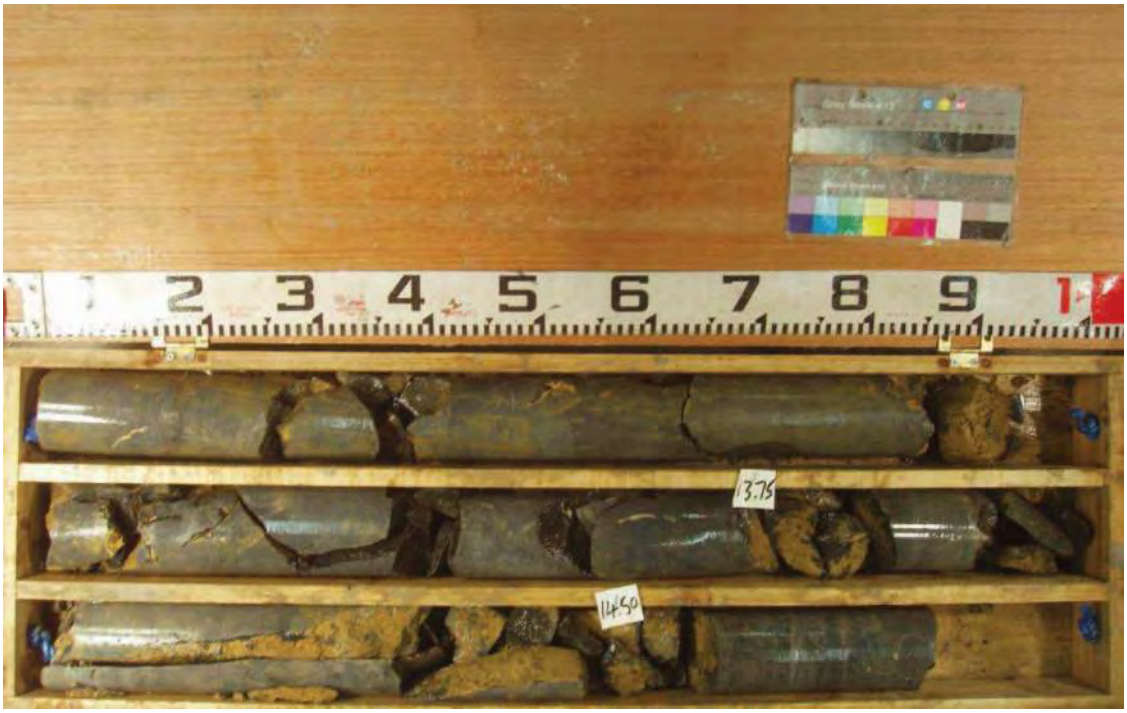
RC02/02 Box 1 (6.00-9.60m)

18746- N6 Galway Transport Project

RC02/02 Box 2 (9.60-12.25m)



RC02/02 Box 3 (12.25-14.75m)



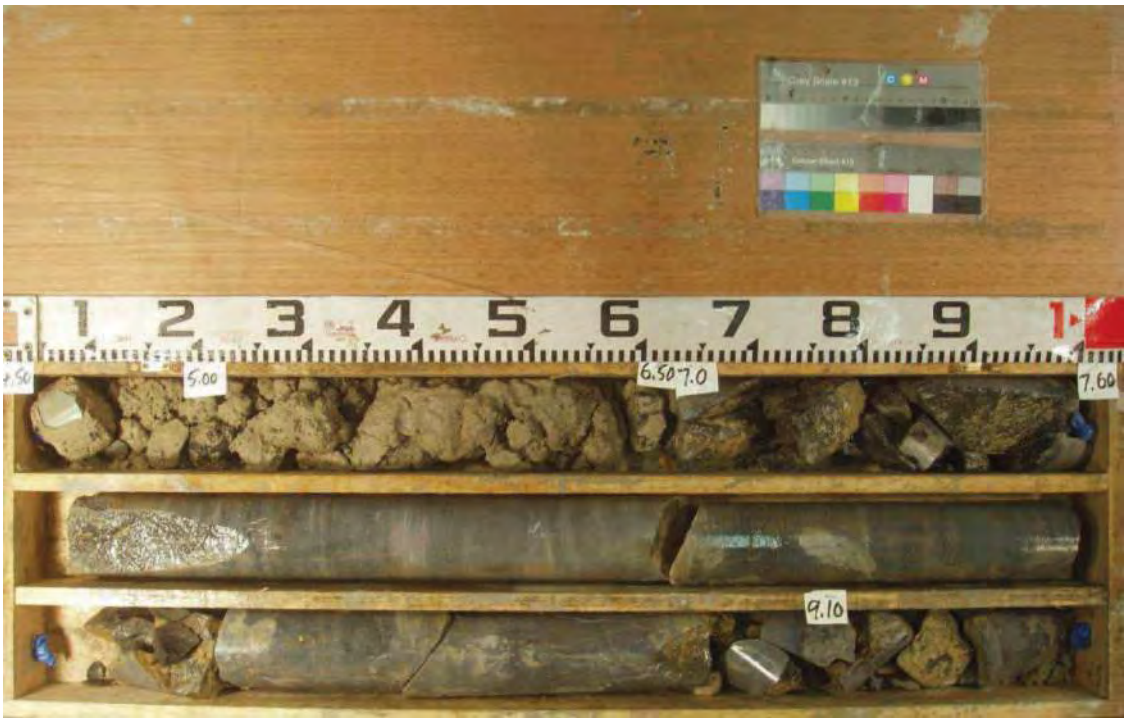
18746- N6 Galway Transport Project

RC02/02 Box 4 (14.75-17.35m)

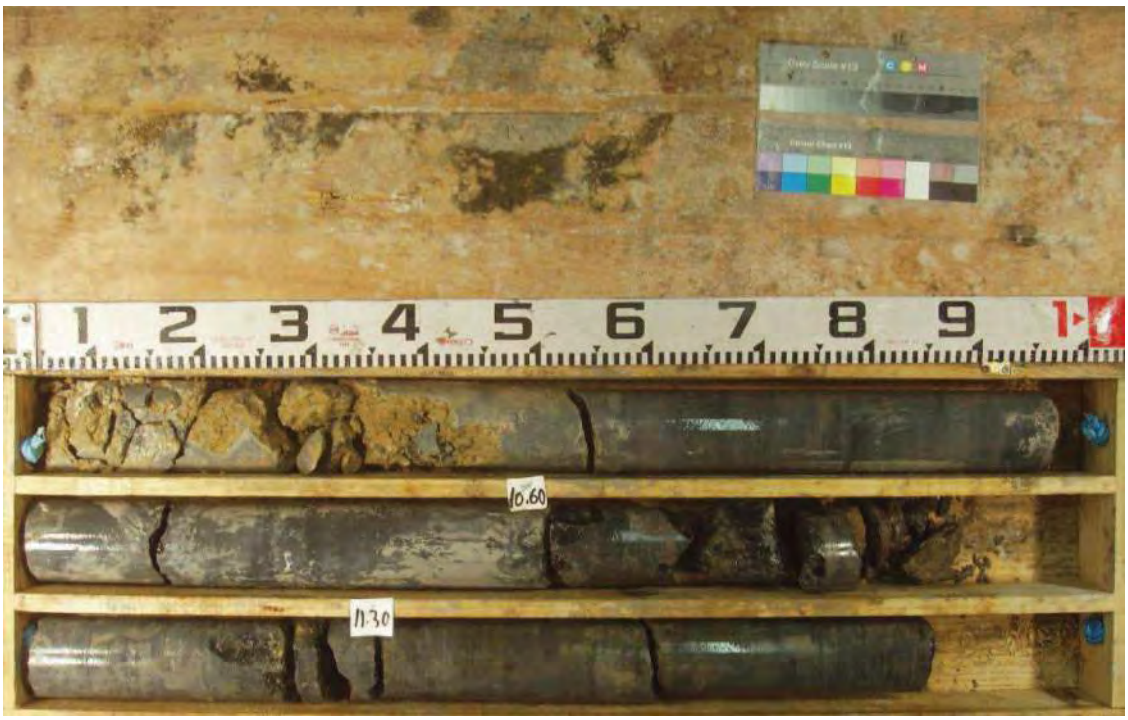
RC02/02 Box 5 (17.35-19.90m)

18746- N6 Galway Transport Project

RC02/03 Box 1 (4.50-9.20m)



RC02/03 Box 2 (9.20-11.80m)



18746- N6 Galway Transport Project

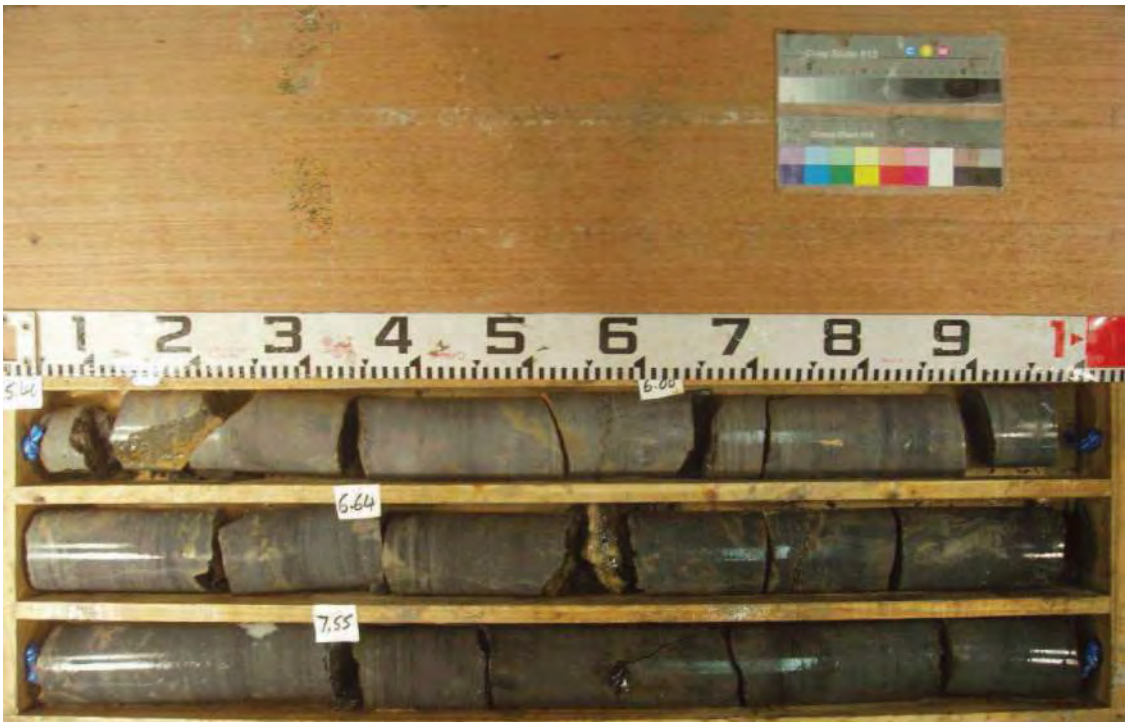
RC02/03 Box 3 (11.80-14.30m)

RC02/03 Box 4 (14.30-17.10m)

18746- N6 Galway Transport Project

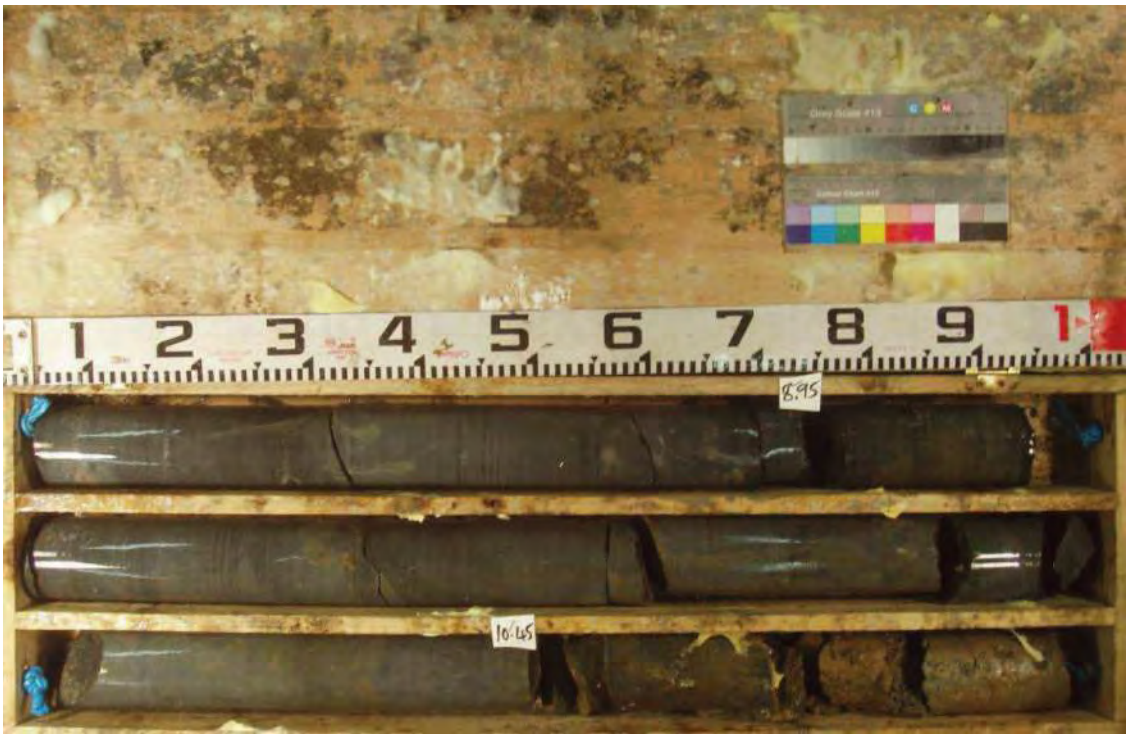
RC02/03 Box 5 (17.10-20.00m)

RC02/04 Box 1 (5.40-8.20m)



18746- N6 Galway Transport Project

RC02/04 Box 2 (8.20-10.90m)



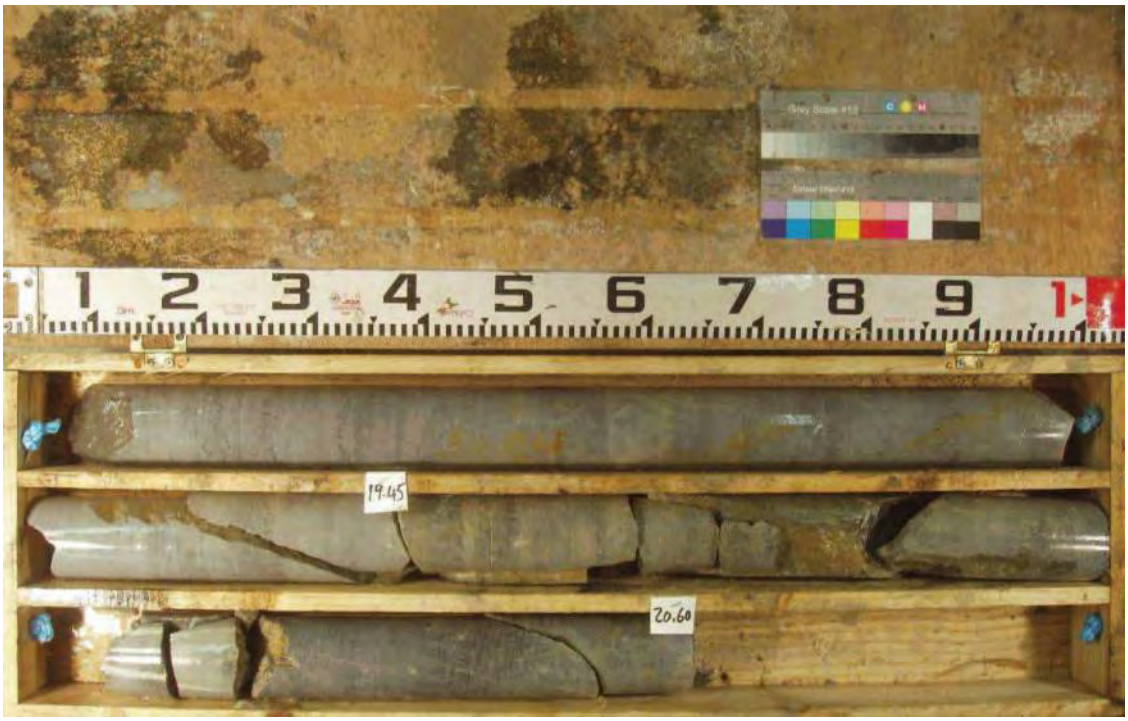
RC02/04 Box 3 (10.90-13.45m)

18746- N6 Galway Transport Project

RC02/04 Box 4 (13.45-16.00m)

RC02/04 Box 5 (16.00-18.25m)

RC02/04 Box 6 (18.25-20.60m)



Appendix 4

Geophysical Survey Report

(APEX Report AGL15188_02)

AGL15188_02

REPORT ON THE GEOPHYSICAL SURVEY FOR THE N6 GALWAY CITY TRANSPORT PROJECT, PHASE 2, CONTRACT 1

FOR

ARUP CONSULTING ENGINEERS

23RD NOVEMBER 2015

APEX Geoservices Limited
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PRIVATE AND CONFIDENTIAL

THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOSERVICES LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

PROJECT NUMBER	AGL15188		
AUTHOR	**CHECKED**	**REPORT STATUS**	**DATE**
EURGEOL YVONNE O'CONNELL P.GEO., M.SC (GEOPHYSICS)	EURGEOL SHANE O'ROURKE P.GEO., M.SC (GEOPHYSICS)	V.01	9TH OCTOBER 2015
EURGEOL YVONNE O'CONNELL P.GEO., M.SC (GEOPHYSICS)	EURGEOL SHANE O'ROURKE P.GEO., M.SC (GEOPHYSICS)	V.02	23RD NOVEMBER 2015

Table of Contents

1. EXECUTIVE SUMMARY

APEX Geoservices Limited was requested IGSL on behalf of ARUP to carry out a geophysical investigation as part of the proposed ground investigation program for the N6 Galway City Transport Project – Phase 2 Ground Investigation Contract 1.

Four rotary core boreholes (RC-2-01 to RC-2-04) were drilled after completion of the geophysical survey and this report has been revised to include their findings.

The objectives of the survey were to: determine the ground conditions, including the thickness of each strata, determine depth to bedrock and to identify any anomalies in the rock formation.

The investigation consisted of 2D Electrical Resistivity Tomography and Seismic Refraction Profiling, carried out along six sections at Galway Racecourse.

The geophysical data predominantly indicated three subsurface layers:

1. A thin (average 1.2m) upper overburden layer comprising of firm to stiff sandy gravelly silt/clay or medium dense to dense silty clayey sand/gravel.

2. An underlying layer (average thickness of 3.6m) of stiff to very stiff sandy gravelly silt/clay or dense to very dense silty clayey sand/gravel. On Section 1 in the west, this layer has been interpreted as wholly comprising moderately weathered limestone. On Section 2, resistivity values suggest that the base of this layer comprises some moderately weathered limestone. On Sections 3, 4, 5 and 6 it is likely that the base of this layer also comprises some moderately weathered limestone as is suggested by rotary cores RC02/03 and RC02/04. The seismic velocities, coupled with the limestone type, suggest that any excavation of the moderately weathered limestone will require very difficult ripping and/or breaking.

3. Slightly weathered to fresh limestone bedrock has been interpreted at an average depth of 4.8m below ground level. The geophysical data indicate predominantly good quality, clean limestone that will require breaking/blasting.

To the southwest of Section 1, a karst feature or palaeo-channel that has been in-filled with very stiff to hard sandy gravelly silt/clay has been observed.

In addition, two zones of low bedrock resistivity have been recorded at depths greater than 27m below ground level on Sections 1 and 2 suggesting possible karstification of limestone.

Additional coring (PBH1 and PBH2) is recommended at the locations indicated on the drawings and listed below to examine specific features indicated by the geophysical survey:

Number	Easting	Northing
PBH1	533066.1	728005.5
PBH2	533327.7	728156.6

The geophysical interpretation and report should be reviewed following completion of the direct investigation.

2. INTRODUCTION

APEX Geoservices Limited was requested IGSL on behalf of ARUP to carry out a geophysical investigation as part of the proposed ground investigation program for the N6 Galway City Transport Project – Phase 2 Ground Investigation Contract 1. The site is located at Galway Racecourse in the east of the city and four rotary core boreholes (RC-2-01 to RC-2-04) have been cored as part of the Ground Investigation Contract 1.

2.1 Survey Objectives

The objectives of the survey were to:

- Determine the ground conditions, including the thickness of each strata;
- Determine depth to bedrock;
- Identify any anomalies in the rock formation.

2.2 Site Background

Surveying was proposed along six sections indicated in Figure 1 and listed below:

Section	Length (m)	Start Coordinates		End Coordinates	
		Easting	Northing	Easting	Northing
1	426	533058.4431	727986.4932	533320.8618	728321.8848
2	416	533610.5172	728110.2223	533202.5153	728176.0736
3	175	533602.6586	728101.9053	533763.4426	728033.1504
4	180	533760.7249	728037.285	533917.5386	727949.7565
5	87	533882.0583	727948.0468	533959.9158	727908.8439
6	114	533953.516	727904.5424	534032.0587	727822.1889

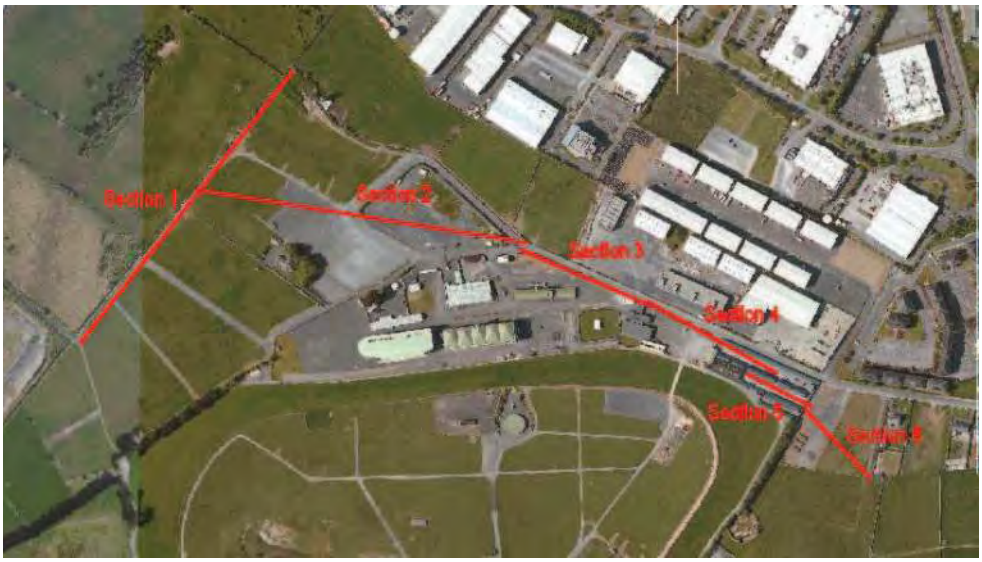

Figure 1: Survey locations indicated by red lines.

The GSI 1:100k Bedrock Geology map for the area indicates that the site is underlain by Visean undifferentiated limestone. This limestone is known to be susceptible to karstification and some nearby karst features are indicated in the GSI open file data. These include two swallow holes and a cave approximately 1.25km southwest of Section 1 and voids recorded in boreholes to the northeast. Karst may be defined as the whole or partial dissolution of limestone bedrock by the action of water and the subsequent whole or partial infill with overburden material. The Teagasc soils map for the area indicates that the subsoils comprise till derived chiefly from limestones.

2.3 Site Investigation

Four rotary cores drilled subsequent to the geophysical survey encountered sandy gravelly clay over fresh to moderately weathered limestone bedrock at depths from 1.5 m to 6 m below ground level. Their locations are indicated on Drawing AGL15228_01.

2.4 Survey Rationale

A geophysical survey was proposed comprising Electrical Resistivity Tomography and Seismic Refraction Profiling:

Electrical Resistivity Tomography (ERT) images the resistivity of the materials in the subsurface along a profile to produce a pseudo-section showing the variation in resistivity to depths dependent on the length of the profile. Each pseudo-section is interpreted to determine the material type along the profile based on the typical resistivities returned for Irish ground materials. Karst zones are indicated by areas of low resistivity indicative of clay infill. Air-filled voids typically have very high resistivities.

Seismic Refraction Profiling measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities. Readings are taken using geophones connected via multi-core cable to a seismograph. This method profiles the depth to the top of the bedrock. Steep changes in bedrock topography can be indicative of karstic topography.

3. RESULTS & INTERPRETATION

The geophysical survey locations are indicated on Drawing AGL15228_01. The methodology for each technique is discussed in detail in Appendix A.

3.1 Electrical Resistivity Tomography

The ERT profiles are presented on Drawings AGL15188_02 to AGL15188_09. Profiling was carried out on Sections 1, 2 and on 6. ERT was attempted on Sections 3 and 4 but, apart from one 40m section, was adversely affected by underground services and/or concrete. ERT was not attempted on Section 5.

The recorded resistivity values have been broadly interpreted on the following basis:

Apparent Resistivity (ohm-m)	Interpretation
100-250	Sandy Gravelly SILT/CLAY
250-550	Silty/clayey SAND/GRAVEL
550-1000	SAND/GRAVEL
550-1000	Weathered Limestone Bedrock
400-3200	Limestone Bedrock

3.2 Seismic Refraction Profiling

The seismic refraction profiles are presented on Drawings AGL15188_02 to AGL15188_09 and the data is tabulated in Appendix C. The seismic data indicates three velocity layers, with the exception of S7 recorded in the southwest of Section 1, which indicated four velocity layers. The seismic velocities have been broadly interpreted on the following basis:

Layer	Seismic Velocity (m/s)	Average Seismic Velocity (m/s)	Average Thickness (m)	Interpretation	Stiffness/ Rock Quality
1	214-1143	541	1.2	Overburden	Firm-stiff/ Medium dense-dense
2	881-2400	1519	3.6	Overburden	Stiff-very stiff/ Dense- very dense
				Weathered/ Fractured Bedrock	Poor-Fair
3	2100-2197	2144		Overburden	Very stiff-Hard
4	2697-5213	3994		Weathered-Fresh Bedrock	Good

3.3 Discussion

Interpreted geophysical sections are presented on Drawings AGL15188_02 to AGL15188_07. The combined interpretation can be summarised as follows:

Layer	Seismic Velocity (m/s)	Average Velocity (m/s)	Apparent Resistivity (ohm-m)	Average Thickness (m)	Interpretation	Estimated Stiffness/ Rock Quality	Excavatability/ Rippability
1	214-1143	541	100-250	1.2	Sandy Gravelly SILT/CLAY	Firm-Stiff	Diggable
			250-550		Silty/clayey SAND/GRAVEL	Medium dense-dense	
2	881-2400	1519	100-250	3.6	Sandy Gravelly SILT/CLAY	Stiff-Very stiff	Diggable
			250-550		Silty/clayey SAND/GRAVEL	Dense- very dense	
			550-2000		Moderately Weathered Limestone Bedrock	Poor-Fair	Very difficult ripping/Break
3	2100-2197	2144	100-250		Sandy Gravelly SILT/CLAY	Very stiff-Hard	Diggable
4	2697-5213	3994	550-8000		Moderately Weathered Limestone Bedrock	Good	Break/Blast

Layer 1: The geophysical data indicate a thin (average 1.2m) upper overburden layer across the site comprising of firm to stiff sandy gravelly silt/clay or medium dense to dense silty clayey sand/gravel.

Layer 2: The underlying layer has an average thickness of 3.6m and has been interpreted as stiff to very stiff sandy gravelly silt/clay or dense to very dense silty clayey sand/gravel.

On Section 1 in the west, high resistivity values suggest that this layer wholly comprises moderately weathered limestone. The seismic velocities, coupled with the limestone type, suggest that excavation of the moderately weathered limestone will require very difficult ripping and/or breaking.

On Section 2, resistivity values suggest that the base of this layer comprises some moderately weathered limestone. On Sections 3, 4, 5 and 6 it is likely that the base of this layer also comprises some moderately weathered limestone as is suggested by rotary cores RC02/03 and RC02/04. The seismic velocities, coupled with the limestone type, suggest that excavation of the moderately weathered limestone will require very difficult ripping and/or breaking.

Layer 3: This layer has only been observed to the southwest of Section 1 and has been interpreted as indicating a karst feature or palaeo-channel that has been in-filled with very stiff to hard sandy gravelly silt/clay.

Layer 4: This layer has been interpreted as indicating slightly weathered to fresh limestone bedrock. With the exception of the southwest of Section 1, the bedrock topography appears only slightly undulating at an average depth of 4.8m below ground level. Both velocity and resistivity values for the limestone are high, indicating good quality limestone in agreement with the rotary cores, that will require breaking/blasting.

Two zones of low bedrock resistivity have been recorded at depths from 27m below ground level on Sections 1 and 2 (Drawings AGL15188_02 and AGL15188_04) suggesting possible karstification of limestone.

4. RECOMMENDATIONS

Additional coring (PBH1 and PBH2) is recommended at the locations indicated on the drawings and listed below to examine specific features indicated by the geophysical survey:

Number	Easting	Northing
PBH1	533066.1	728005.5
PBH2	533327.7	728156.6

The geophysical interpretation and report should be reviewed following completion of any further direct investigation.

5. REFERENCES

Bell F.G., 1993;

'Engineering Geology', Blackwell Scientific Press.

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'RES2DINV ver. 3.4 Users Manual', Birmingham, England.

Hagedoorn, J.G., 1959;

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6. APPENDIX A: DETAILED METHODOLOGY

6.1 Electrical Resistivity Tomography

Principles

The ERT method records a large number of resistivity readings in order to map lateral and vertical changes in material types. This surveying technique makes use of the Wenner resistivity array. Data acquisition includes the use of 64 electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage.

Data Collection

Profiles were recorded using an ABEM meter, imaging software, three 32 takeout multicore cables and 96 stainless steel electrodes with a 3m or 5m electrode spacing. Saline solution was used at the electrode\ground interface in order to gain a good electrical contact required for the technique to work effectively. The recorded data were processed and viewed immediately after the survey. The data was acquired on 29th and 30th September 2015.

Data Processing

Field readings were stored in computer files and inverted using the RES2DINV package (Campus Geophysical Instruments, 1997) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-depth model of the resistivities.

The inverted 2D-Resistivity models and corresponding interpreted geology are displayed on the accompanying drawings. Distance is indicated along the horizontal axis of the profiles. Profiles have been contoured using the same contour intervals and colour codes.

Relocation

All data were referenced using a differential GPS system with c.20mm accuracy.

6.2 Seismic Refraction Profiling

Principles

The seismic refraction profiling method measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

Data Collection

Nineteen seismic spreads were recorded on the 24th and 25th September 2015 using a Geode high-resolution 24 channel digital seismograph with geophone spacing of 2m and 3m. The source of the seismic waves was a sledgehammer.

Data Processing

The recorded data was interpreted using the ray-tracing and intercept time methods, to acquire depths to layer boundaries and the P-wave velocities of these layers, using the FIRSTPIX and GREMIX programs.

GREMIX interprets seismic refraction data as a laterally varying layered earth structure. It incorporates the slope-intercept method, parts of the Plus-Minus Method of Hagedoorn (1959), Time-Delay Method, and features the Generalized Reciprocal Method (GRM) of Palmer (1980). Up to four layers can be mapped, one deduced from direct arrivals and three deduced from refractions. Phantoming of all possible travel time pairs can be carried out by adjusting reciprocal times of off shots.

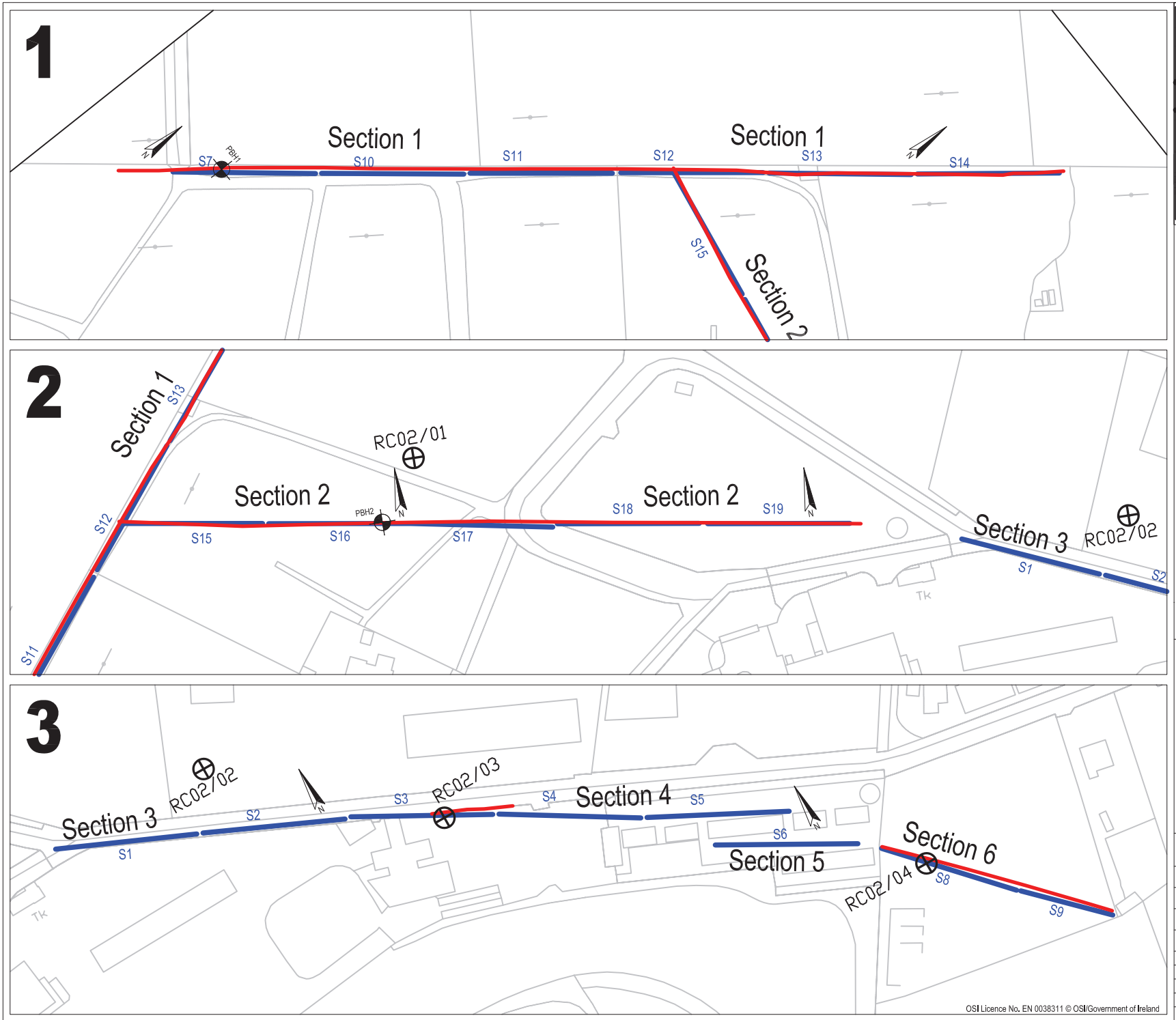
Relocation

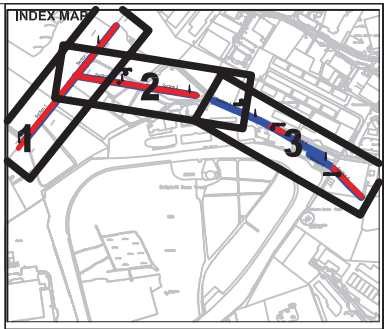
All data were referenced using a differential GPS system with c.20mm accuracy.

7. APPENDIX B: DRAWINGS

The information derived from the geophysical investigation is presented in the following drawings:

AGL15188_01	Overview Location Map	1:2500 @ A4
AGL15188_02	Section 1 (Part 1)	1:1250 @ A4
AGL15188_03	Section 1 (Part 2)	1:1250 @ A4
AGL15188_04	Section 2 (Part 1)	1:1250 @ A4
AGL15188_05	Section 2 (Part 2)	1:1250 @ A4
AGL15188_06	Section 3	1:1250 @ A4
AGL15188_07	Section 4	1:1250 @ A4
AGL15188_08	Section 5	1:1250 @ A4
AGL15188_09	Section 6	1:1250 @ A4





LEGEND:

- R1 — Electrical Resistivity Tomography
- S1 — Seismic refraction profile
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- PBH1 — APEX Proposed borehole

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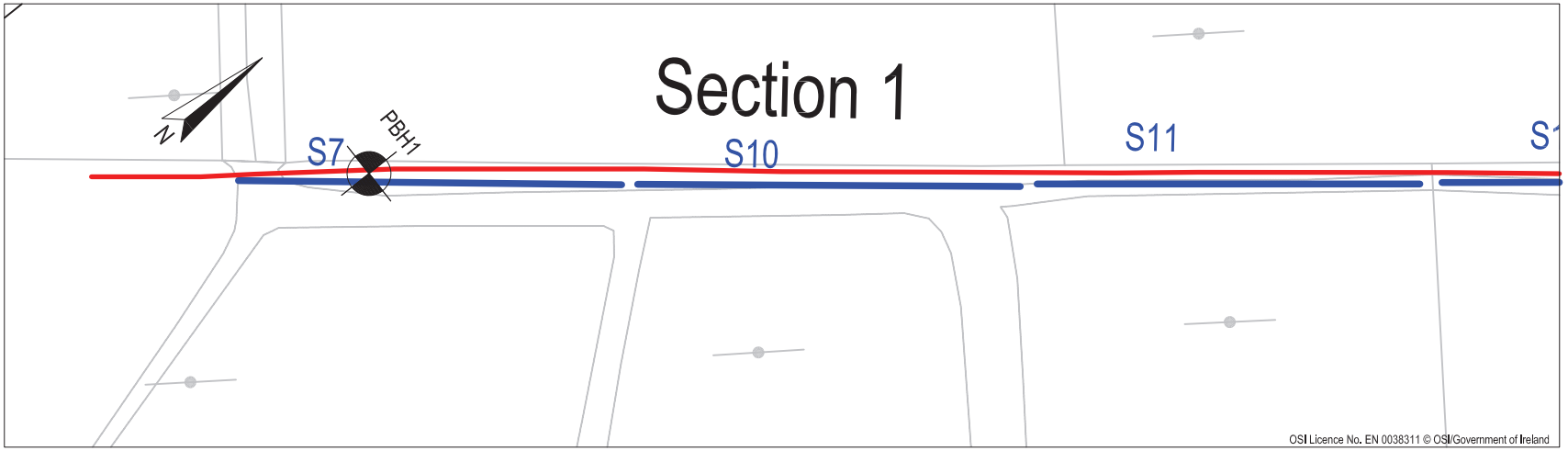
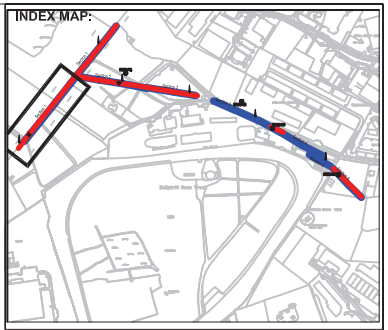
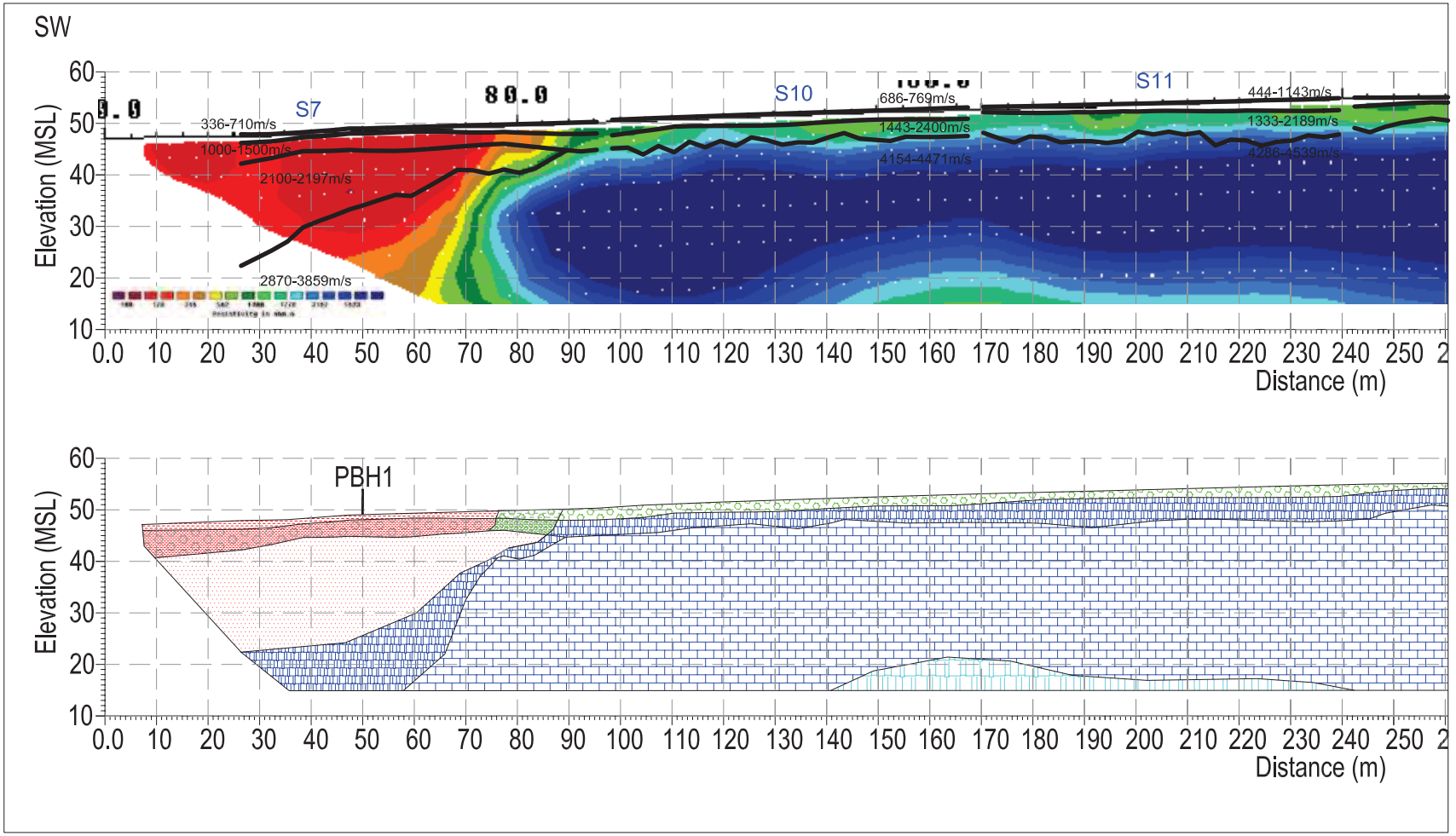
02	23-11-15	YOC	

Section 1







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CLIENT:	ARUP
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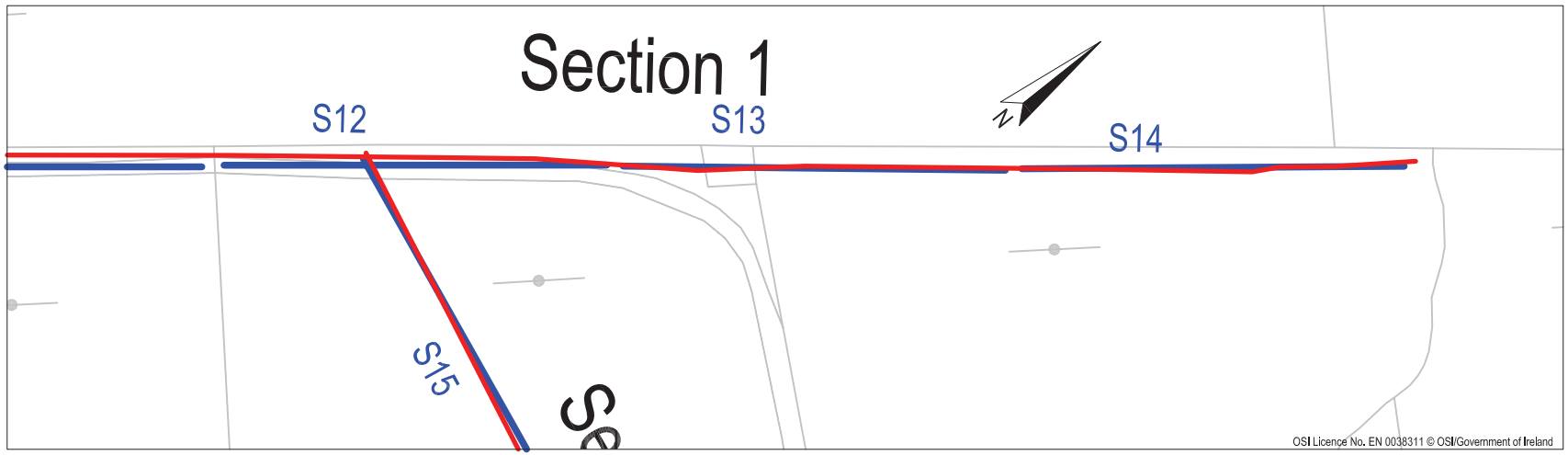
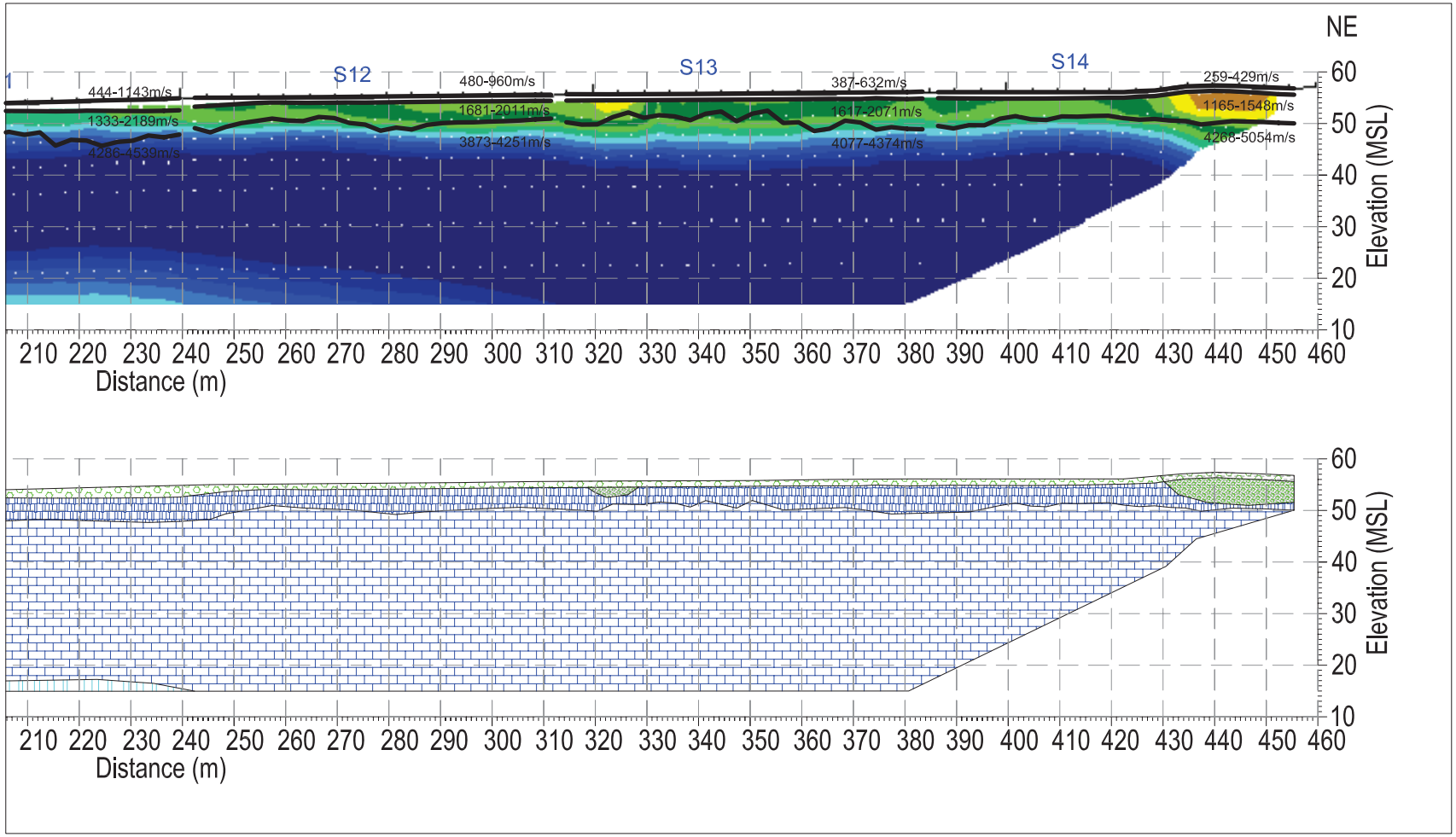
Section 1





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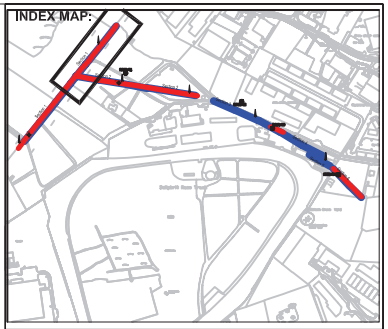

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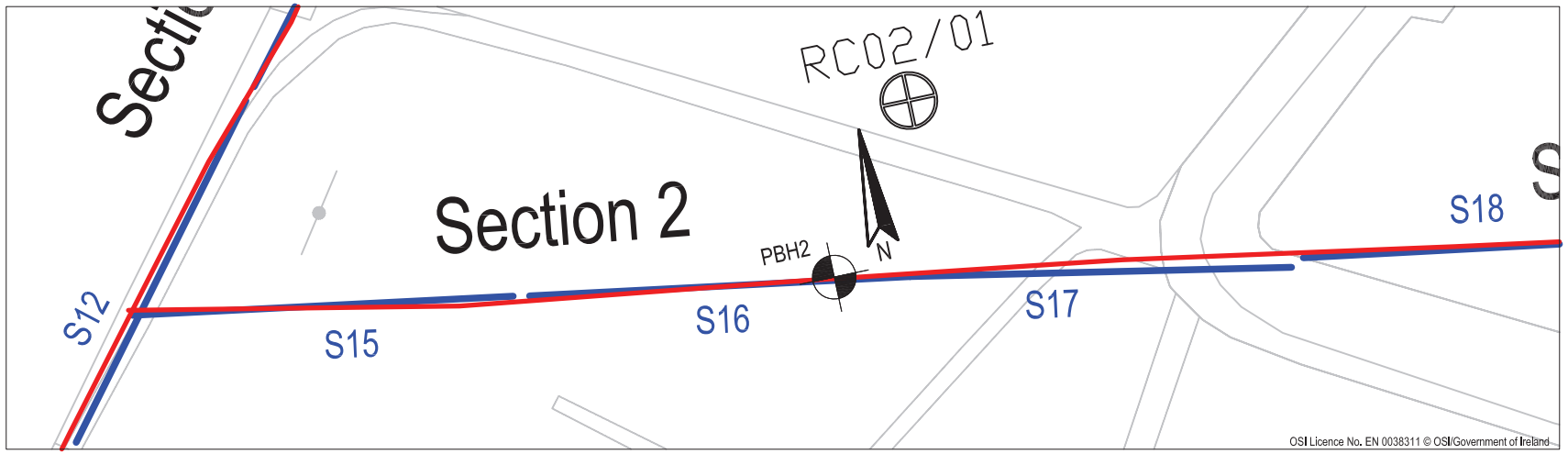

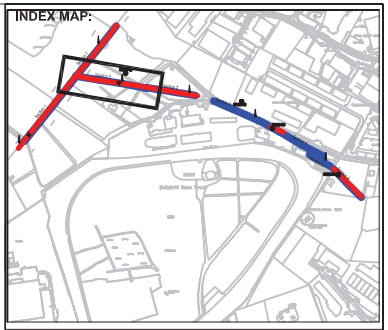

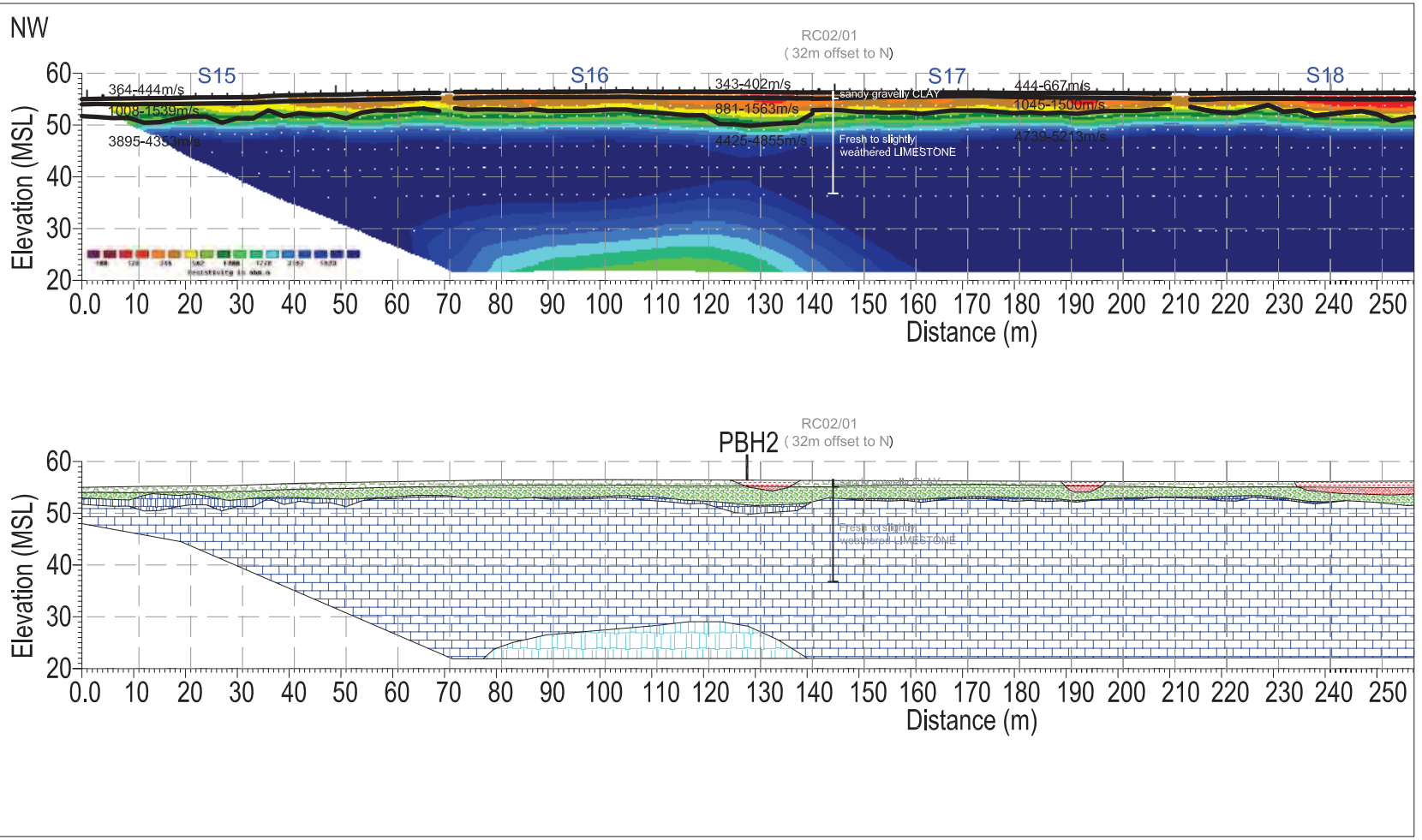

LEGEND:

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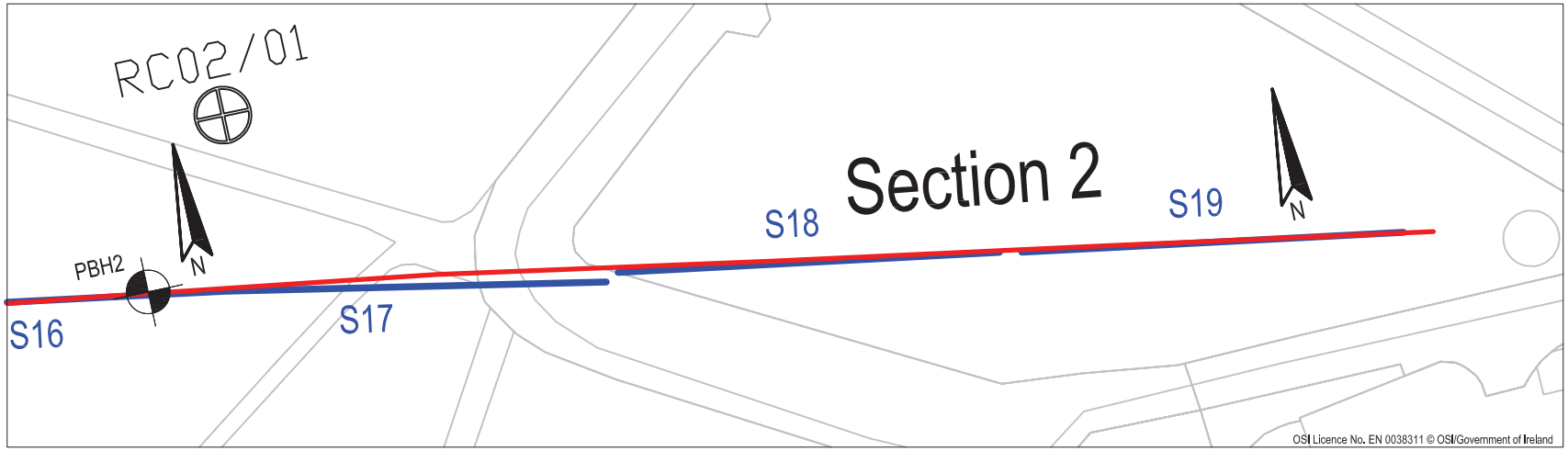

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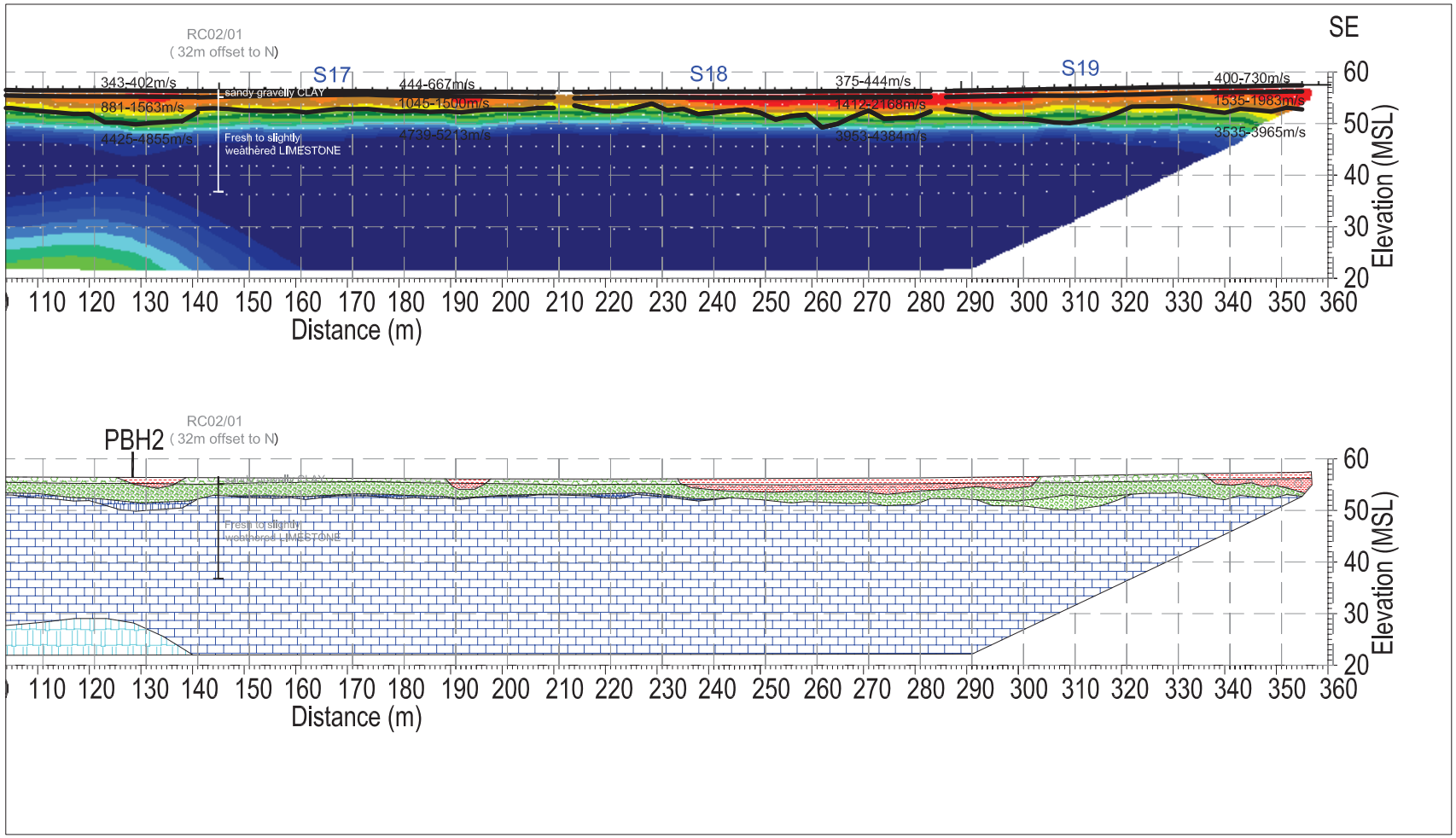

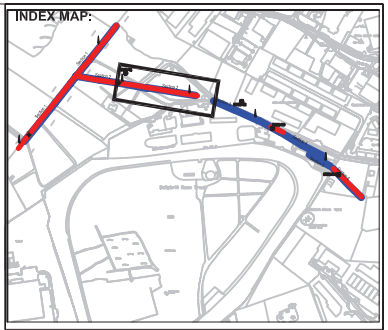

LEGEND:

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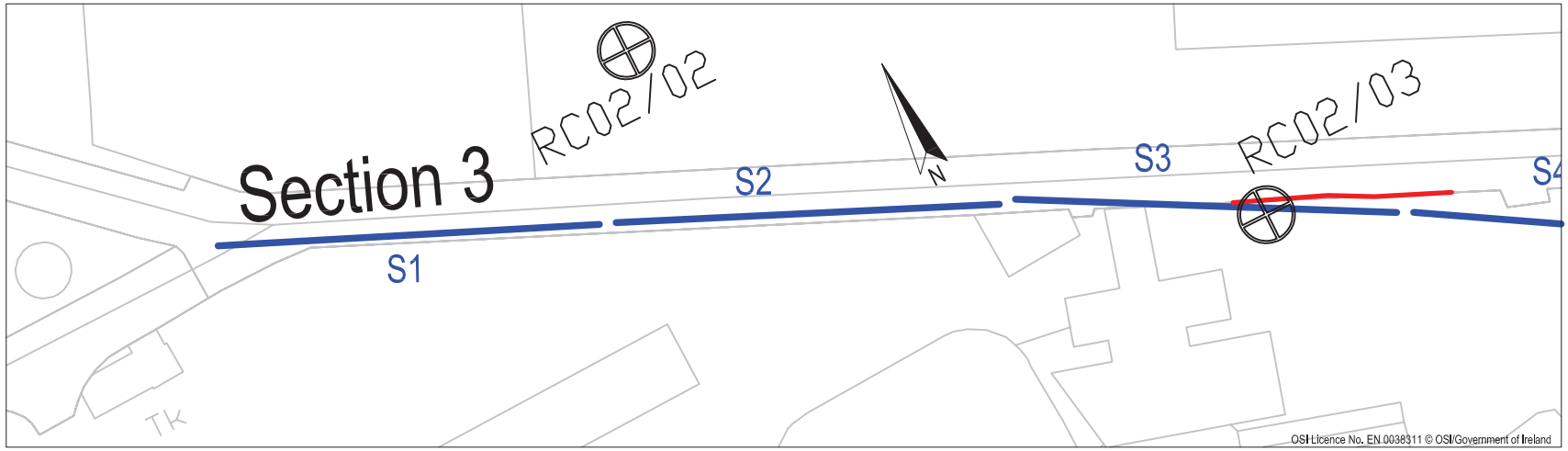

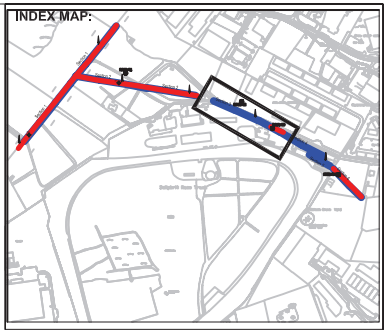

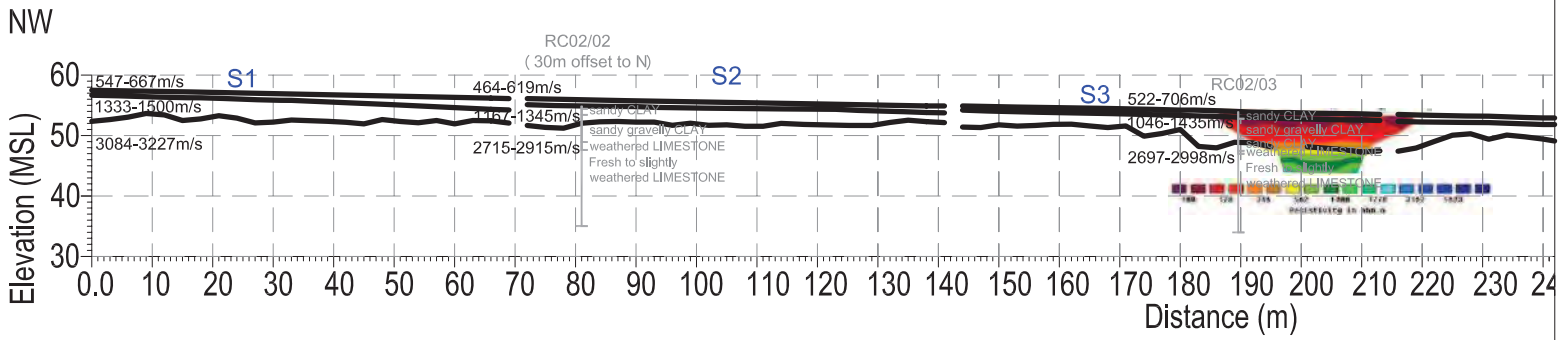

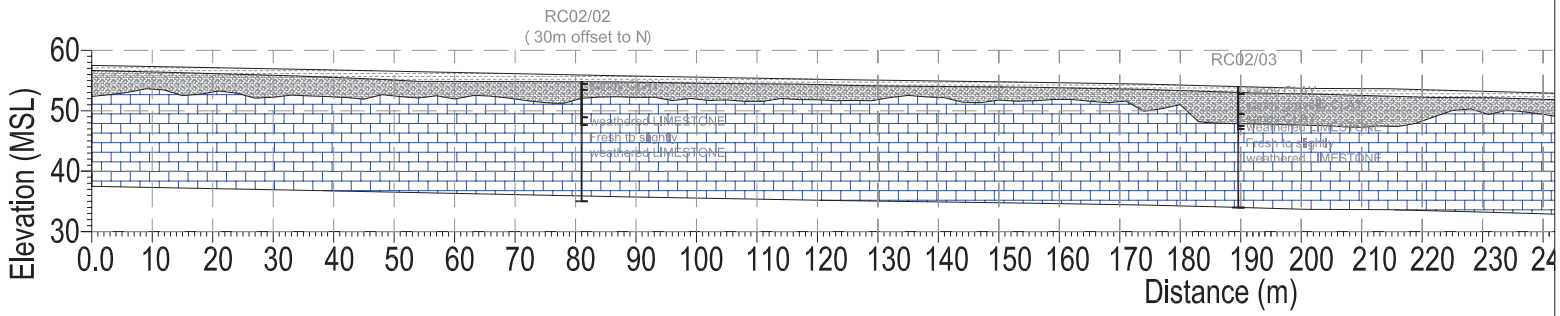

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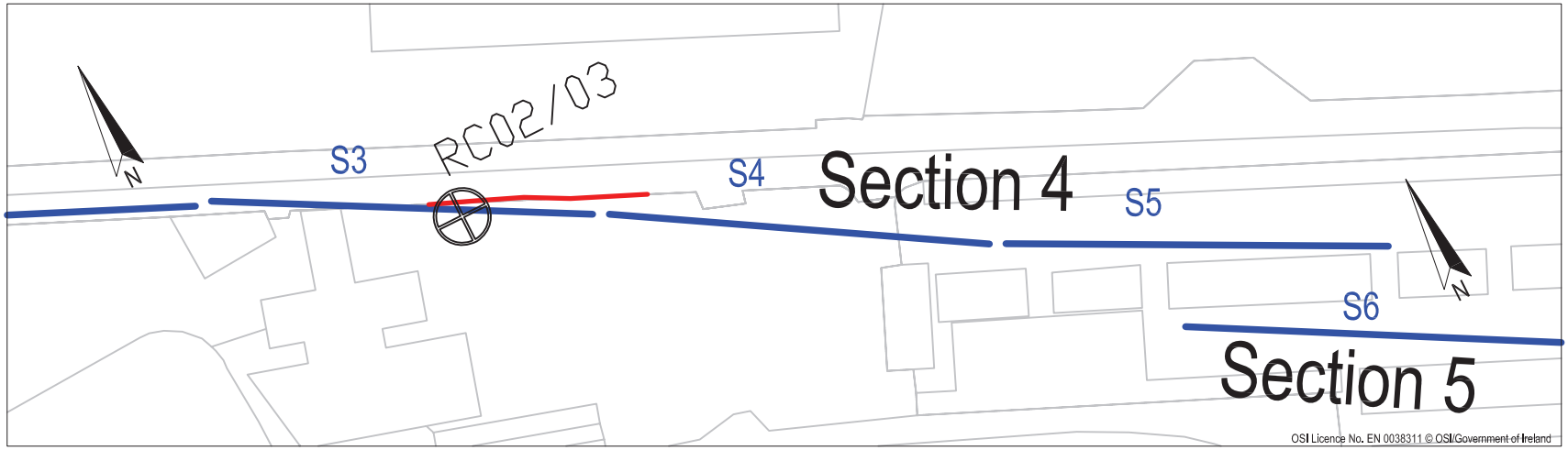

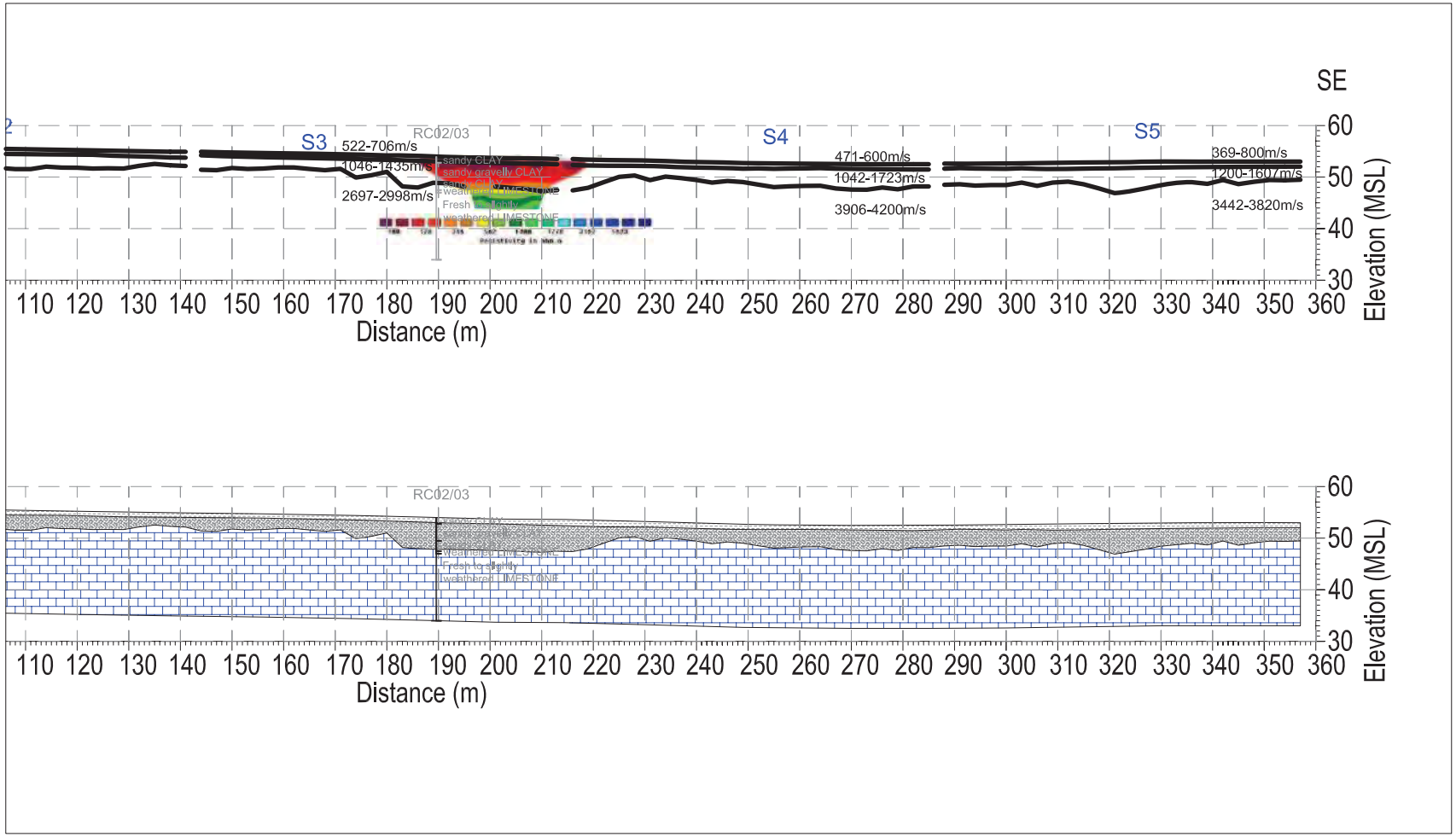

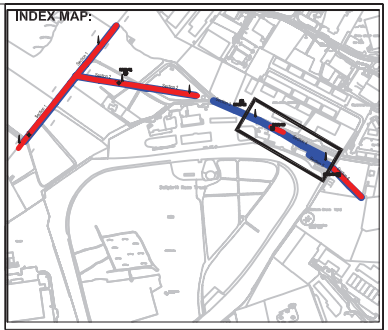

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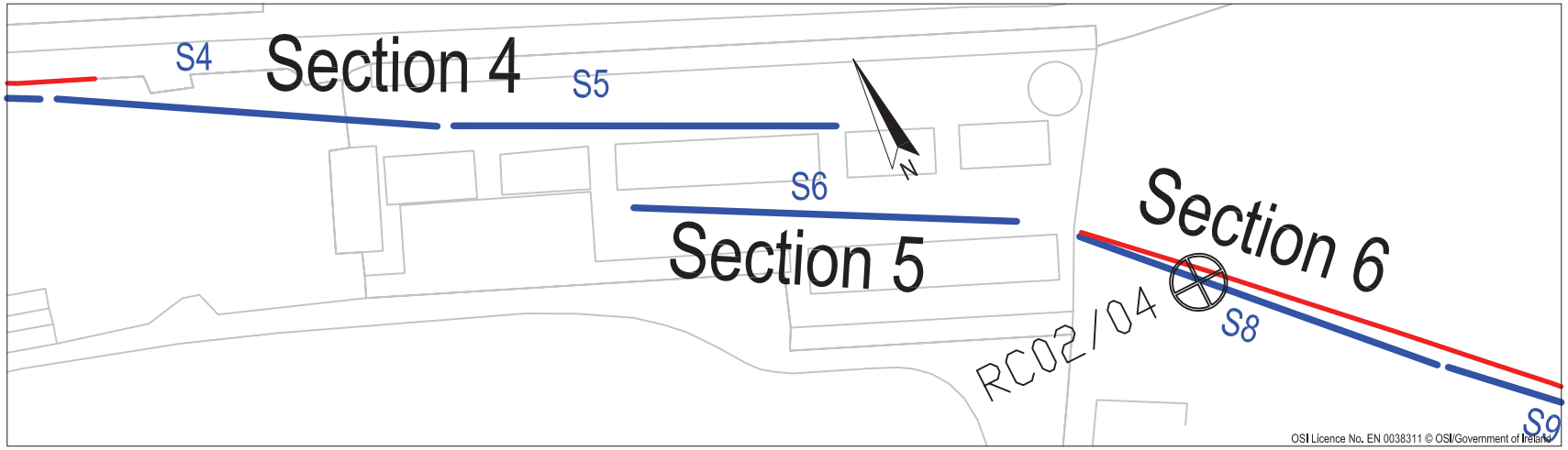

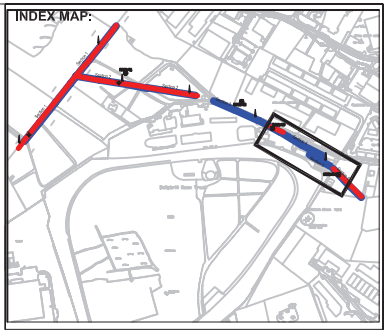

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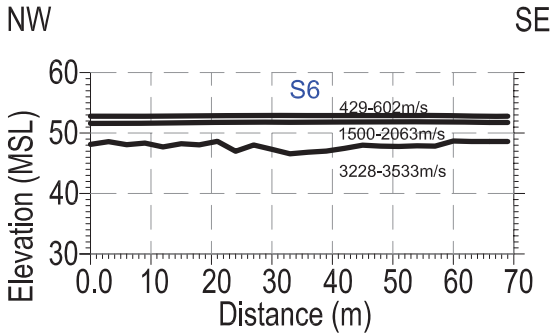

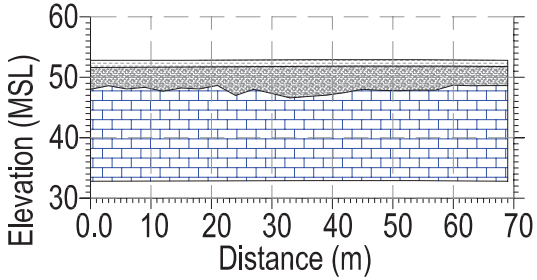

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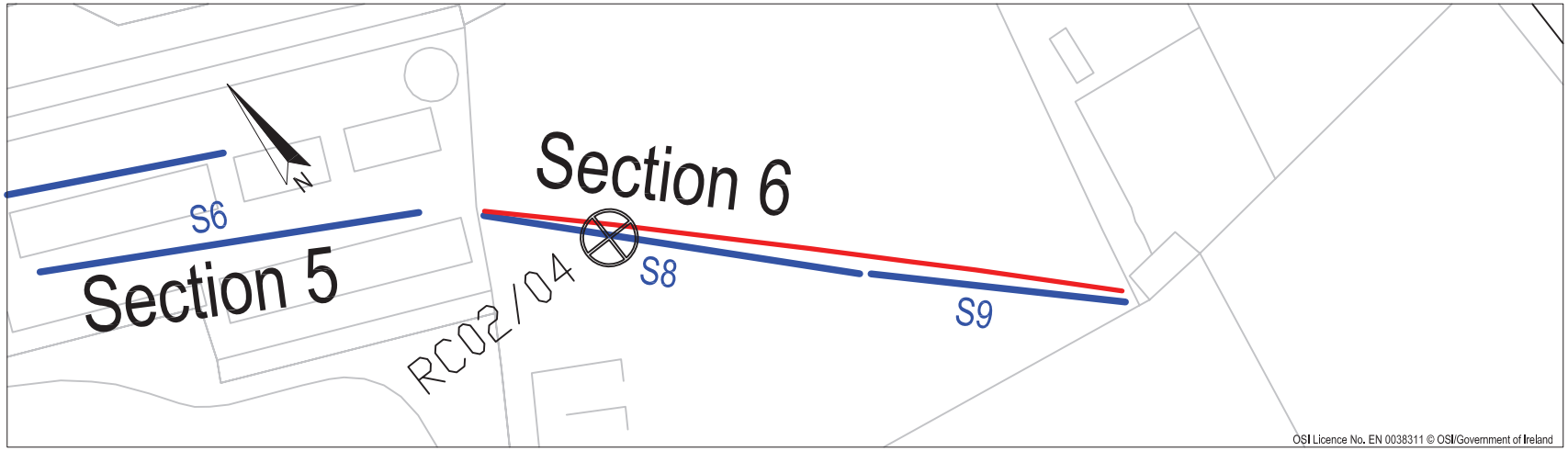

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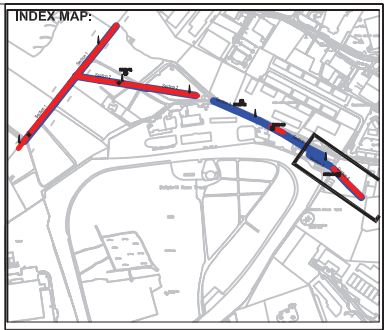

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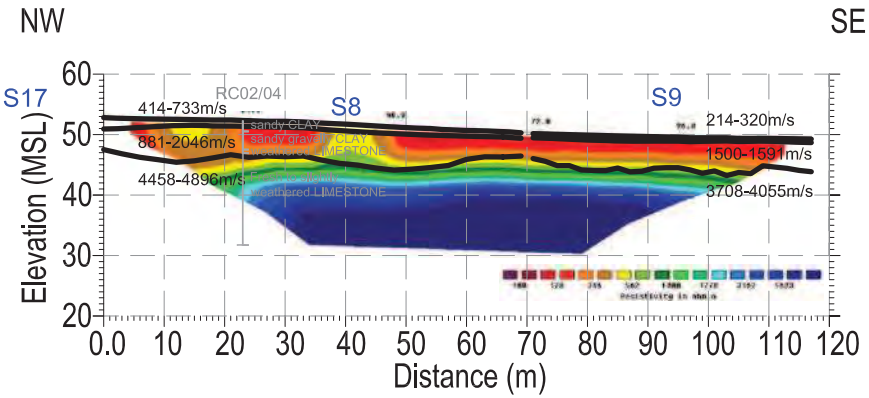

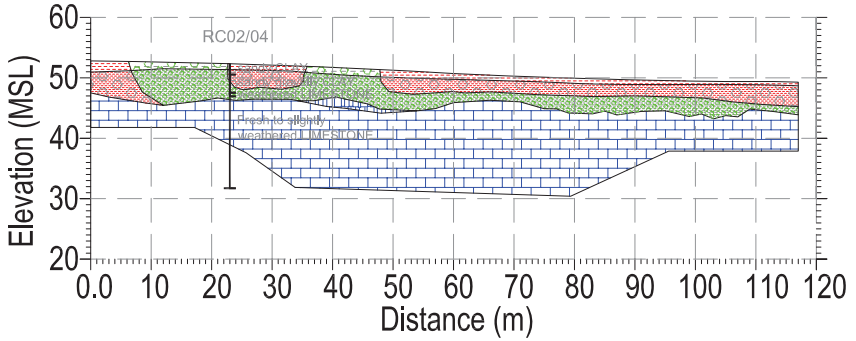

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8. APPENDIX C: SEISMIC REFRACTION DATA

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
1	0	632	1333		3227	0.8	4.3	5.1	57.5	56.66	52.37
1	3	613	1343		3227	0.9	4.0	4.8	57.5	56.63	52.66
1	6	595	1353		3227	0.9	3.5	4.4	57.4	56.51	53.04
1	9	577	1363		3208	0.9	2.7	3.7	57.3	56.39	53.65
1	12	558	1373		3208	0.9	3.0	3.9	57.3	56.37	53.42
1	15	558	1373		3208	0.9	3.8	4.7	57.2	56.27	52.5
1	18	556	1391		3208	1.0	3.5	4.5	57.2	56.24	52.75
1	21	554	1410		3208	1.0	2.8	3.8	57.1	56.11	53.27
1	24	551	1429		3179	1.0	3.2	4.2	57.1	56.09	52.9
1	27	549	1448		3167	1.0	3.9	4.9	57	55.96	52.08
1	30	547	1467		3167	1.1	3.6	4.7	56.9	55.83	52.22
1	33	547	1467		3167	1.1	3.3	4.3	56.9	55.83	52.57
1	36	558	1470		3167	1.1	3.2	4.4	56.8	55.67	52.45
1	39	568	1473		3167	1.2	3.3	4.5	56.8	55.61	52.35
1	42	579	1476		3084	1.3	3.3	4.5	56.7	55.44	52.19
1	45	590	1479		3084	1.3	3.4	4.7	56.6	55.27	51.92
1	48	601	1482		3084	1.4	2.6	4.0	56.6	55.2	52.65
1	51	612	1485		3084	1.5	2.7	4.2	56.5	55.03	52.33
1	54	623	1488		3084	1.5	2.8	4.3	56.4	54.86	52.11
1	57	634	1491		3084	1.6	2.3	3.9	56.4	54.78	52.48
1	60	645	1494		3084	1.7	2.7	4.4	56.3	54.6	51.94
1	63	656	1497		3130	1.8	2.0	3.8	56.3	54.52	52.49
1	66	667	1500		3130	1.9	1.9	3.8	56.2	54.34	52.43
1	69	667	1500		3130	1.9	2.2	4.0	56.1	54.24	52.06
2	0	571	1333		2915	1.0	3.4	4.4	56.1	55.1	51.68
2	3	545	1336		2915	1.0	3.6	4.7	56	54.98	51.35
2	6	518	1339		2915	1.0	3.8	4.8	56	54.98	51.22
2	9	491	1342		2904	1.0	2.8	3.9	55.9	54.87	52.04
2	12	464	1345		2904	1.0	2.6	3.6	55.9	54.88	52.26
2	15	464	1345		2904	1.0	2.5	3.5	55.8	54.78	52.33
2	18	489	1323		2904	1.0	2.6	3.6	55.8	54.78	52.22
2	21	514	1300		2887	1.0	2.5	3.5	55.7	54.68	52.23
2	24	539	1277		2887	1.0	2.9	3.9	55.6	54.58	51.69
2	27	564	1254		2905	1.0	2.6	3.6	55.6	54.59	52.03
2	30	589	1232		2905	1.0	2.8	3.8	55.5	54.51	51.69
2	33	589	1232		2905	1.0	2.7	3.7	55.5	54.51	51.78
2	36	595	1219		2905	1.0	2.9	3.9	55.4	54.43	51.54
2	39	601	1206		2905	0.9	2.9	3.9	55.4	54.46	51.55
2	42	607	1193		2888	0.9	2.4	3.3	55.3	54.38	52.02
2	45	613	1180		2905	0.9	2.6	3.5	55.3	54.41	51.84
2	48	619	1167		2905	0.9	2.5	3.4	55.2	54.33	51.82
2	51	619	1167		2905	0.9	2.7	3.5	55.2	54.33	51.66
2	54	603	1172		2905	0.9	2.5	3.4	55.1	54.18	51.71
2	57	587	1178		2828	1.0	2.5	3.4	55.1	54.12	51.66
2	60	570	1183		2828	1.0	1.8	2.8	55	53.98	52.18
2	63	554	1189		2715	1.1	1.4	2.5	55	53.93	52.54
2	66	538	1194		2801	1.1	1.5	2.6	54.9	53.8	52.29
2	69	522	1200		2888	1.1	1.6	2.8	54.9	53.77	52.15
3	0	706	1091		2736	0.7	2.8	3.5	54.9	54.21	51.41
3	3	673	1080		2736	0.7	2.7	3.5	54.8	54.06	51.32
3	6	639	1069		2697	0.8	2.3	3.0	54.8	54.03	51.76
3	9	606	1057		2697	0.8	2.3	3.1	54.7	53.9	51.57
3	12	573	1046		2726	0.8	2.2	3.0	54.7	53.89	51.66
3	15	573	1046		2726	0.8	1.9	2.7	54.6	53.79	51.86
3	18	570	1069		2726	0.8	1.9	2.7	54.6	53.77	51.87
3	21	567	1092		2779	0.8	2.1	2.9	54.5	53.66	51.57
3	24	564	1115		2779	0.9	2.3	3.2	54.5	53.65	51.32
3	27	561	1138		2779	0.9	2.0	2.8	54.4	53.54	51.59
3	30	558	1161		2779	0.9	3.6	4.5	54.4	53.52	49.9
3	33	555	1183		2748	0.9	3.1	4.0	54.3	53.41	50.35
3	36	552	1206		2748	0.9	2.3	3.2	54.2	53.3	51.01
3	39	549	1229		2748	0.9	5.1	6.0	54.2	53.29	48.19
3	42	546	1252		2748	0.9	5.2	6.1	54.1	53.17	47.96
3	45	543	1275		2825	0.9	4.2	5.1	54	53.06	48.89

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
3	48	540	1298		2825	1.0	4.2	5.1	53.9	52.95	48.77
3	51	537	1321		2908	1.0	4.7	5.6	53.8	52.84	48.16
3	54	534	1344		2908	1.0	5.1	6.1	53.8	52.82	47.69
3	57	531	1367		2908	1.0	4.6	5.6	53.7	52.71	48.15
3	60	528	1389		2893	1.0	4.8	5.8	53.7	52.7	47.92
3	63	525	1412		2893	1.0	4.9	5.9	53.6	52.59	47.68
3	66	522	1435		2952	1.0	5.3	6.3	53.6	52.58	47.26
3	69	522	1435		2998	1.0	5.0	6.0	53.5	52.48	47.46
4	0	545	1700		3906	1.2	4.9	6.1	53.5	52.33	47.41
4	3	545	1706		3906	1.1	4.3	5.5	53.4	52.26	47.93
4	6	545	1712		3906	1.1	3.2	4.3	53.3	52.19	49.01
4	9	545	1717		4154	1.1	2.2	3.3	53.3	52.22	50.04
4	12	545	1723		4154	1.1	1.9	2.9	53.2	52.15	50.3
4	15	545	1723		4154	1.1	2.8	3.8	53.2	52.15	49.39
4	18	531	1698		4154	1.1	2.0	3.0	53.1	52.04	50.08
4	21	516	1674		4154	1.1	2.1	3.2	53	51.93	49.8
4	24	501	1649		4122	1.1	2.4	3.5	52.9	51.83	49.42
4	27	486	1625		4162	1.1	2.9	4.0	52.9	51.82	48.93
4	30	471	1600		4162	1.1	2.5	3.6	52.8	51.72	49.25
4	33	471	1600		4162	1.1	2.6	3.7	52.7	51.62	49.02
4	36	473	1488		4162	1.0	3.2	4.2	52.7	51.67	48.52
4	39	474	1377		4041	1.0	3.6	4.5	52.6	51.61	48.06
4	42	476	1265		4041	1.0	3.4	4.4	52.6	51.65	48.21
4	45	478	1153		4058	0.9	3.4	4.3	52.6	51.69	48.3
4	48	480	1042		4125	0.9	3.4	4.3	52.6	51.72	48.32
4	51	480	1042		4125	0.9	3.8	4.7	52.5	51.62	47.8
4	54	504	1133		4125	0.9	4.0	4.9	52.5	51.59	47.59
4	57	528	1225		3993	0.9	4.0	5.0	52.5	51.56	47.54
4	60	552	1317		3993	1.0	3.6	4.5	52.5	51.53	47.96
4	63	576	1408		3913	1.0	3.9	4.9	52.5	51.5	47.62
4	66	600	1500		4057	1.0	3.3	4.3	52.5	51.46	48.19
4	69	600	1500		4200	1.0	3.3	4.3	52.5	51.46	48.18
5	0	800	1412		3442	1.0	3.1	4.1	52.6	51.63	48.5
5	3	743	1440		3442	0.9	3.1	4.0	52.6	51.73	48.62
5	6	686	1468		3442	0.9	3.3	4.2	52.6	51.66	48.36
5	9	629	1496		3480	1.0	3.2	4.1	52.6	51.62	48.46
5	12	571	1524		3545	1.0	3.1	4.1	52.6	51.6	48.46
5	15	571	1524		3545	1.0	2.8	3.8	52.7	51.7	48.93
5	18	531	1540		3545	1.1	3.3	4.4	52.7	51.61	48.3
5	21	491	1557		3579	1.2	2.6	3.8	52.7	51.55	48.94
5	24	450	1574		3579	1.2	2.5	3.7	52.8	51.61	49.12
5	27	410	1590		3579	1.2	3.0	4.2	52.8	51.6	48.6
5	30	369	1607		3679	1.2	3.9	5.1	52.9	51.71	47.79
5	33	369	1607		3679	1.2	4.8	6.0	52.9	51.71	46.9
5	36	394	1569		3679	1.2	4.5	5.7	52.9	51.72	47.25
5	39	418	1531		3588	1.2	4.0	5.2	53	51.84	47.85
5	42	443	1493		3588	1.1	3.4	4.6	53	51.86	48.45
5	45	467	1455		3588	1.1	3.1	4.2	53	51.9	48.84
5	48	492	1417		3607	1.1	2.9	4.0	53	51.95	49.02
5	51	492	1417		3607	1.1	3.3	4.3	53	51.95	48.68
5	54	489	1373		3645	1.0	2.5	3.6	53	51.97	49.44
5	57	487	1330		3645	1.0	3.4	4.4	53	51.98	48.63
5	60	485	1287		3645	1.0	2.9	3.9	53	51.99	49.09
5	63	482	1243		3645	1.0	2.6	3.6	53	52.01	49.43
5	66	480	1200		3820	1.0	2.7	3.6	53	52.02	49.37
5	69	480	1200		3820	1.0	2.6	3.5	53	52.02	49.47
6	0	429	2063		3366	1.2	3.5	4.7	52.8	51.6	48.14
6	3	464	2057		3366	1.2	3.0	4.2	52.8	51.59	48.59
6	6	500	2050		3366	1.2	3.5	4.7	52.8	51.6	48.08
6	9	536	2043		3421	1.2	3.3	4.5	52.8	51.63	48.34
6	12	571	2037		3421	1.1	4.0	5.1	52.8	51.67	47.7
6	15	571	2037		3421	1.1	3.4	4.6	52.8	51.67	48.23
6	18	577	2036		3421	1.1	3.7	4.8	52.9	51.77	48.06
6	21	583	2035		3421	1.1	3.1	4.3	52.9	51.77	48.64

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
6	24	589	2034		3343	1.1	4.8	5.9	52.9	51.78	46.99
6	27	595	2033		3338	1.1	3.8	4.9	52.9	51.78	48.02
6	30	602	2032		3338	1.1	4.5	5.6	52.9	51.78	47.32
6	33	602	2032		3338	1.1	5.2	6.3	52.9	51.78	46.57
6	36	586	1926		3338	1.1	5.0	6.1	52.9	51.8	46.82
6	39	570	1819		3338	1.1	4.8	5.9	52.9	51.81	47.03
6	42	554	1713		3228	1.1	4.4	5.4	52.9	51.83	47.47
6	45	538	1606		3228	1.1	3.8	4.9	52.9	51.84	48
6	48	522	1500		3239	1.0	4.0	5.1	52.9	51.86	47.83
6	51	522	1500		3239	1.0	4.1	5.1	52.9	51.86	47.78
6	54	532	1543		3239	1.0	4.0	5.0	52.9	51.86	47.89
6	57	542	1586		3239	1.0	4.0	5.1	52.9	51.86	47.85
6	60	552	1629		3239	1.0	3.2	4.2	52.9	51.86	48.69
6	63	561	1671		3386	1.0	3.2	4.2	52.8	51.76	48.6
6	66	571	1714		3533	1.0	3.2	4.2	52.8	51.76	48.61
6	69	571	1714		3533	1.0	3.2	4.2	52.8	51.76	48.61
7	0	686	1500	2197		1.7	4.0	5.7	47.9	46.2	
7	3	611	1375	2197		1.5	3.6	5.1	47.9	46.36	
7	6	536	1250	2197		1.4	3.2	4.6	47.9	46.52	
7	9	461	1125	2197		1.2	2.9	4.1	48.1	46.9	
7	12	386	1000	2106		1.0	2.7	3.7	48.3	47.28	
7	15	386	1000	2106		1.0	2.8	3.9	48.5	47.48	
7	18	376	1000	2106		1.0	3.0	4.0	48.7	47.7	
7	21	366	1000	2106		1.0	3.2	4.1	49	48.02	
7	24	356	1000	2106		1.0	3.3	4.3	49	48.04	
7	27	346	1000	2106		0.9	3.5	4.4	49.1	48.16	
7	30	336	1000	2117		0.9	3.6	4.6	49.2	48.28	
7	33	336	1000	2128		0.9	3.6	4.5	49.3	48.38	
7	36	345	1000	2139		1.0	3.4	4.4	49.4	48.39	
7	39	353	1000	2150		1.1	3.1	4.2	49.5	48.38	
7	42	361	1000	2161		1.2	2.8	4.1	49.5	48.27	
7	45	370	1000	2172		1.3	2.6	3.9	49.6	48.26	
7	48	378	1000	2183		1.5	2.3	3.8	49.7	48.24	
7	51	378	1000	2183		1.5	2.3	3.8	49.8	48.34	
7	54	445	1053	2169		1.7	2.5	4.1	49.9	48.24	
7	57	511	1105	2155		1.8	2.7	4.5	49.9	48.06	
7	60	577	1158	2142		2.0	2.9	4.9	50	48	
7	63	644	1211	2128		2.1	3.1	5.3	50.1	47.96	
7	66	710	1263	2114		2.3	3.4	5.6	50.2	47.95	
7	69	710	1263	2100		2.3	3.2	5.4	50.3	48.05	
8	0	600	2046		4727	1.9	3.4	5.3	52.8	50.94	47.51
8	3	612	1963		4679	1.7	4.2	5.9	52.7	51.04	46.82
8	6	625	1880		4631	1.5	4.9	6.4	52.6	51.15	46.23
8	9	637	1797		4582	1.2	5.5	6.8	52.6	51.37	45.84
8	12	649	1714		4534	1.0	6.1	7.1	52.5	51.51	45.43
8	15	649	1714		4534	1.0	5.8	6.8	52.5	51.51	45.67
8	18	666	1611		4534	1.0	5.3	6.3	52.4	51.42	46.15
8	21	683	1509		4534	1.0	4.8	5.7	52.4	51.43	46.66
8	24	700	1406		4584	1.0	5.1	6.0	52.3	51.34	46.26
8	27	716	1303		4742	1.0	4.8	5.7	52.2	51.24	46.46
8	30	733	1200		4742	1.0	4.9	5.9	52.2	51.23	46.34
8	33	733	1200		4742	1.0	4.7	5.7	52.1	51.13	46.44
8	36	674	1335		4742	1.0	5.1	6.1	51.9	50.86	45.79
8	39	615	1469		4742	1.1	5.5	6.6	51.8	50.7	45.25
8	42	556	1604		4896	1.1	5.5	6.7	51.6	50.47	44.95
8	45	497	1739		4896	1.1	5.8	6.9	51.4	50.26	44.47
8	48	497	1739		4896	1.1	6.0	7.2	51.3	50.16	44.14
8	51	483	1596		4896	1.1	5.7	6.8	51.1	50.01	44.27
8	54	469	1453		4896	1.1	5.4	6.5	51	49.95	44.55
8	57	456	1310		4458	1.0	4.9	5.9	50.8	49.8	44.9
8	60	442	1167		4458	1.0	3.9	4.8	50.7	49.74	45.89
8	63	428	1024		4458	0.9	3.3	4.3	50.6	49.67	46.34
8	66	414	881		4667	0.9	3.3	4.2	50.5	49.6	46.29
8	69	414	881		4667	0.9	3.0	3.9	50.3	49.4	46.44

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
9	0	320	1500		3901	0.6	4.8	5.4	49.4	48.8	44
9	2	293	1521		3946	0.6	4.6	5.2	49.4	48.83	44.21
9	4	267	1543		3990	0.5	4.4	5.0	49.5	48.97	44.54
9	6	240	1564		4035	0.5	4.2	4.7	49.5	49	44.77
9	8	214	1586		4035	0.5	4.1	4.5	49.5	49.05	44.96
9	10	214	1586		4035	0.5	5.4	5.8	49.5	49.03	43.67
9	12	220	1587		4035	0.5	5.1	5.6	49.5	49	43.86
9	14	227	1588		4035	0.5	5.7	6.3	49.6	49.07	43.35
9	16	233	1589		4035	0.6	4.9	5.5	49.6	49.04	44.13
9	18	240	1590		3910	0.6	5.3	5.9	49.6	49.01	43.72
9	20	246	1591		3910	0.6	4.7	5.3	49.6	48.97	44.28
9	22	246	1591		3910	0.6	4.4	5.0	49.7	49.06	44.66
9	24	255	1586		3910	0.7	4.4	5.1	49.7	49.02	44.65
9	26	263	1581		3910	0.7	4.5	5.2	49.8	49.07	44.56
9	28	272	1576		4055	0.8	5.0	5.7	49.8	49.03	44.08
9	30	280	1571		3971	0.8	5.1	5.9	49.9	49.09	43.97
9	32	289	1566		3971	0.9	4.4	5.3	49.9	49.04	44.6
9	34	289	1566		3971	0.9	5.0	5.8	50	49.14	44.17
9	36	276	1555		3971	0.8	5.0	5.8	50	49.17	44.21
9	38	262	1544		3971	0.8	5.0	5.8	50.1	49.31	44.29
9	40	249	1533		3971	0.8	4.4	5.1	50.1	49.34	44.99
9	42	236	1522		3730	0.7	4.5	5.2	50.2	49.48	45.01
9	44	222	1511		3708	0.7	3.8	4.5	50.2	49.51	45.72
9	46	222	1500		3708	0.7	3.5	4.1	50.3	49.61	46.16
10	0	769	2000		4225	3.0	2.5	5.6	50.7	47.68	45.15
10	3	756	1894		4225	2.7	2.8	5.5	50.8	48.09	45.29
10	6	743	1788		4225	2.4	4.5	6.9	50.9	48.49	43.99
10	9	730	1682		4225	2.1	3.3	5.4	51	48.88	45.61
10	12	717	1576		4171	1.8	5.0	6.8	51.2	49.37	44.39
10	15	717	1576		4171	1.8	3.0	4.9	51.3	49.47	46.44
10	18	721	1675		4171	1.9	4.1	6.0	51.4	49.5	45.36
10	21	726	1775		4171	2.0	2.9	4.9	51.5	49.52	46.6
10	24	731	1875		4471	2.1	3.9	6.0	51.6	49.55	45.64
10	27	735	1974		4471	2.1	2.3	4.4	51.7	49.57	47.29
10	30	740	2074		4471	2.2	2.8	5.1	51.8	49.58	46.74
10	33	740	2074		4471	2.2	3.8	6.0	51.9	49.68	45.87
10	36	731	1948		4471	2.1	3.6	5.7	52	49.88	46.32
10	39	723	1822		4471	2.0	3.8	5.8	52.1	50.08	46.28
10	42	714	1695		4471	1.9	3.0	4.9	52.2	50.27	47.3
10	45	706	1569		4428	1.9	2.3	4.2	52.3	50.45	48.12
10	48	697	1443		4154	1.8	3.6	5.3	52.4	50.63	47.06
10	51	697	1443		4154	1.8	3.9	5.7	52.5	50.73	46.82
10	54	695	1635		4154	1.8	4.2	6.0	52.6	50.76	46.6
10	57	692	1826		4154	1.9	3.4	5.3	52.7	50.78	47.42
10	60	690	2017		4196	2.0	3.4	5.5	52.8	50.79	47.35
10	63	688	2209		4239	2.1	3.4	5.5	52.9	50.79	47.36
10	66	686	2400		4281	2.2	3.4	5.6	53	50.79	47.44
10	69	686	2400		4281	2.2	3.4	5.6	53.1	50.89	47.54
11	0	444	1333		4314	1.0	4.0	5.0	53.2	52.16	48.17
11	3	491	1431		4314	1.1	4.9	6.1	53.2	52.06	47.13
11	6	538	1528		4314	1.2	5.8	7.0	53.3	52.07	46.3
11	9	584	1626		4535	1.3	4.6	5.9	53.4	52.08	47.46
11	12	631	1723		4535	1.4	4.7	6.1	53.4	51.99	47.31
11	15	631	1723		4535	1.4	5.8	7.2	53.5	52.09	46.34
11	18	653	1745		4535	1.4	5.6	7.1	53.6	52.17	46.53
11	21	676	1767		4484	1.4	5.6	7.1	53.6	52.16	46.54
11	24	699	1789		4484	1.5	6.0	7.5	53.7	52.24	46.2
11	27	722	1810		4323	1.5	5.7	7.2	53.8	52.33	46.6
11	30	744	1832		4323	1.5	3.9	5.4	53.8	52.32	48.38
11	33	744	1832		4323	1.5	4.6	6.1	53.9	52.42	47.85
11	36	756	1903		4323	1.6	4.1	5.6	54	52.44	48.38
11	39	768	1975		4323	1.7	4.6	6.3	54.1	52.45	47.82
11	42	780	2046		4323	1.7	4.1	5.8	54.1	52.36	48.28
11	45	792	2117		4539	1.8	6.7	8.5	54.2	52.38	45.71

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
11	48	804	2189		4389	1.9	5.5	7.5	54.3	52.38	46.84
11	51	804	2189		4389	1.9	5.8	7.7	54.4	52.48	46.7
11	54	871	2158		4286	2.0	6.8	8.8	54.5	52.49	45.67
11	57	939	2128		4286	2.1	6.0	8.1	54.5	52.4	46.43
11	60	1007	2097		4286	2.2	5.7	7.9	54.6	52.42	46.68
11	63	1075	2067		4286	2.3	4.8	7.0	54.7	52.45	47.68
11	66	1143	2036		4286	2.3	5.1	7.5	54.8	52.48	47.35
11	69	1143	2036		4286	2.3	4.7	7.1	54.9	52.58	47.85
12	0	960	2003		3873	1.7	4.2	5.9	55	53.26	49.11
12	3	874	1923		3873	1.5	5.2	6.7	55	53.46	48.28
12	6	788	1842		3873	1.4	4.3	5.7	55	53.64	49.33
12	9	702	1762		4025	1.2	3.7	4.9	55	53.82	50.09
12	12	616	1681		4134	1.0	3.5	4.5	55	53.99	50.52
12	15	616	1681		4134	1.0	3.1	4.1	55.1	54.09	50.96
12	18	595	1712		4134	1.1	3.5	4.5	55.1	54.05	50.58
12	21	575	1743		4047	1.1	3.6	4.6	55.1	54.02	50.47
12	24	555	1774		4050	1.1	2.7	3.8	55.1	53.99	51.27
12	27	535	1805		4050	1.1	3.0	4.1	55.2	54.07	51.06
12	30	514	1836		4127	1.2	3.9	5.1	55.2	54.05	50.12
12	33	514	1836		4127	1.2	4.3	5.4	55.2	54.05	49.78
12	36	509	1805		4127	1.1	5.5	6.6	55.2	54.06	48.61
12	39	505	1774		4032	1.1	5.0	6.1	55.3	54.17	49.21
12	42	500	1744		4032	1.1	5.3	6.5	55.3	54.18	48.84
12	45	495	1713		4020	1.1	4.5	5.6	55.3	54.19	49.74
12	48	490	1682		4020	1.1	4.2	5.3	55.4	54.3	50.09
12	51	490	1682		4020	1.1	4.1	5.2	55.4	54.3	50.22
12	54	488	1748		4020	1.1	4.0	5.2	55.4	54.28	50.25
12	57	486	1813		4020	1.1	4.0	5.1	55.5	54.36	50.39
12	60	484	1879		4020	1.2	3.9	5.1	55.5	54.34	50.45
12	63	482	1945		4251	1.2	3.7	4.9	55.5	54.31	50.6
12	66	480	2011		4251	1.2	3.6	4.8	55.6	54.39	50.8
12	69	480	2011		4251	1.2	3.4	4.6	55.6	54.39	50.97
13	72	387	2048		4319	1.2	4.2	5.5	55.7	54.46	50.25
13	75	406	1961		4319	1.2	4.7	5.9	55.7	54.47	49.8
13	78	425	1875		4318	1.2	4.6	5.9	55.7	54.48	49.85
13	81	443	1789		4318	1.2	3.3	4.5	55.7	54.5	51.24
13	84	462	1703		4268	1.2	2.4	3.6	55.7	54.52	52.14
13	87	481	1617		4268	1.2	3.4	4.6	55.7	54.55	51.12
13	90	481	1617		4268	1.2	2.9	4.1	55.7	54.55	51.63
13	93	467	1631		4268	1.2	3.2	4.3	55.7	54.54	51.38
13	96	453	1645		4238	1.2	3.9	5.1	55.7	54.54	50.65
13	99	438	1659		4223	1.2	2.7	3.9	55.8	54.64	51.91
13	102	424	1673		4223	1.2	2.3	3.5	55.8	54.64	52.33
13	105	424	1673		4223	1.2	4.2	5.4	55.8	54.64	50.45
13	108	427	1753		4223	1.2	2.7	3.9	55.8	54.62	51.91
13	111	429	1832		4223	1.2	2.2	3.4	55.9	54.71	52.5
13	114	432	1912		4077	1.2	4.6	5.8	55.9	54.69	50.1
13	117	434	1992		4077	1.2	4.4	5.7	55.9	54.67	50.23
13	120	437	2071		4121	1.2	6.2	7.4	56	54.76	48.56
13	123	437	2071		4121	1.2	5.8	7.0	56	54.76	49.01
13	126	476	2010		4121	1.2	4.2	5.4	56	54.76	50.56
13	129	515	1949		4160	1.2	4.6	5.8	56	54.78	50.19
13	132	554	1887		4160	1.2	6.1	7.3	56.1	54.92	48.81
13	135	593	1826		4374	1.1	6.0	7.1	56.1	54.97	48.96
13	138	632	1765		4374	1.1	6.7	7.8	56.1	55.05	48.34
13	141	632	1765		4374	1.1	6.9	7.9	56.2	55.15	48.27
14	216	429	1548		4450	1.2	5.4	6.6	56.1	54.92	49.54
14	219	424	1522		4478	1.2	5.8	7.0	56.1	54.9	49.06
14	222	420	1496		4478	1.2	5.2	6.4	56.1	54.88	49.68
14	225	416	1469		4478	1.2	5.2	6.5	56.1	54.86	49.65
14	228	411	1443		4478	1.3	3.9	5.2	56.1	54.84	50.94
14	231	407	1417		4478	1.3	3.4	4.7	56.1	54.82	51.42
14	234	407	1417		4832	1.3	4.0	5.3	56.1	54.82	50.83
14	237	389	1373		4832	1.3	4.2	5.4	56.1	54.85	50.7

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
14	240	371	1329		4832	1.2	3.5	4.7	56.1	54.89	51.39
14	243	353	1285		4832	1.2	3.6	4.8	56.1	54.93	51.32
14	246	335	1242		4832	1.1	3.5	4.6	56.1	54.97	51.47
14	249	317	1198		5054	1.1	3.5	4.6	56.1	55.01	51.5
14	252	317	1198		4593	1.1	4.0	5.1	56.1	55.01	51.03
14	255	305	1195		4593	1.1	4.5	5.6	56.3	55.21	50.75
14	258	294	1191		4593	1.1	4.4	5.5	56.4	55.32	50.89
14	261	282	1188		4614	1.1	5.2	6.2	56.8	55.73	50.58
14	264	270	1185		4268	1.1	5.7	6.7	57.2	56.14	50.46
14	267	259	1182		4566	1.0	6.4	7.5	57.3	56.26	49.83
14	270	259	1178		4566	1.0	6.2	7.3	57.4	56.36	50.14
14	273	266	1175		4566	1.1	5.8	6.9	57.3	56.22	50.45
14	276	272	1172		4549	1.1	5.7	6.8	57.2	56.08	50.38
14	279	279	1168		4533	1.2	5.6	6.8	57.1	55.94	50.31
14	282	286	1165		4516	1.2	5.6	6.8	56.9	55.7	50.14
14	285	286	1165		4500	1.2	5.6	6.8	56.8	55.6	50.04
15	0	444	1008		4353	1.0	2.3	3.3	55	54	51.72
15	3	424	1141		4325	1.0	2.5	3.5	55.1	54.06	51.56
15	6	404	1273		4296	1.1	2.7	3.8	55.1	54.02	51.34
15	9	384	1406		4296	1.1	2.6	3.7	55.1	53.99	51.39
15	12	364	1539		4296	1.1	3.6	4.8	55.2	54.06	50.44
15	15	364	1539		4296	1.1	3.5	4.7	55.2	54.06	50.54
15	18	367	1531		4296	1.1	2.9	4.0	55.2	54.06	51.19
15	21	371	1523		4099	1.2	2.5	3.7	55.3	54.15	51.65
15	24	374	1515		4099	1.2	2.5	3.7	55.3	54.15	51.63
15	27	378	1508		4099	1.2	3.7	4.9	55.3	54.15	50.45
15	30	381	1500		4186	1.2	2.9	4.1	55.4	54.24	51.3
15	33	381	1500		4186	1.2	3.0	4.1	55.4	54.24	51.26
15	36	380	1459		4186	1.2	1.6	2.7	55.6	54.45	52.86
15	39	379	1418		3895	1.1	2.9	4.0	55.7	54.57	51.69
15	42	377	1377		3895	1.1	2.4	3.5	55.8	54.68	52.3
15	45	376	1336		3895	1.1	2.7	3.9	55.8	54.69	51.95
15	48	375	1295		4116	1.1	2.8	3.9	55.9	54.8	52.04
15	51	375	1295		4116	1.1	3.5	4.6	55.9	54.8	51.27
15	54	377	1255		4116	1.1	2.5	3.6	56	54.91	52.39
15	57	380	1214		3895	1.1	2.1	3.2	56	54.93	52.85
15	60	382	1173		3895	1.1	2.3	3.3	56.1	55.04	52.79
15	63	385	1132		3895	1.1	2.0	3.1	56.1	55.05	53.05
15	66	387	1091		4088	1.0	2.0	3.0	56.2	55.16	53.17
15	69	387	1091		4088	1.0	2.5	3.5	56.2	55.16	52.67
16	72	343	1333		4425	1.2	1.9	3.2	56.4	55.16	53.22
16	75	345	1220		4426	1.2	2.3	3.5	56.4	55.23	52.92
16	78	348	1107		4426	1.1	2.3	3.4	56.4	55.29	53.04
16	81	351	994		4709	1.0	2.4	3.4	56.4	55.36	52.99
16	84	353	881		4855	1.0	2.6	3.5	56.4	55.42	52.87
16	87	353	881		4855	1.0	2.4	3.4	56.4	55.42	53.03
16	90	353	914		4855	1.0	2.7	3.7	56.4	55.4	52.73
16	93	353	947		4655	1.0	2.7	3.7	56.4	55.39	52.74
16	96	353	979		4655	1.0	2.6	3.7	56.4	55.38	52.75
16	99	353	1012		4655	1.0	2.5	3.6	56.4	55.36	52.83
16	102	353	1045		4846	1.1	2.4	3.5	56.5	55.44	53.01
16	105	353	1045		4846	1.1	2.4	3.5	56.5	55.44	53
16	108	363	1149		4846	1.1	2.7	3.8	56.4	55.32	52.59
16	111	373	1252		4666	1.1	2.9	4.0	56.4	55.3	52.36
16	114	382	1356		4636	1.1	3.1	4.3	56.4	55.28	52.15
16	117	392	1460		4636	1.1	3.4	4.6	56.4	55.26	51.84
16	120	402	1563		4636	1.2	3.3	4.5	56.4	55.24	51.91
16	123	402	1563		4636	1.2	5.0	6.2	56.4	55.24	50.22
16	126	394	1558		4636	1.2	5.1	6.3	56.4	55.24	50.15
16	129	387	1552		4636	1.2	5.4	6.6	56.4	55.24	49.85
16	132	379	1547		4636	1.2	5.1	6.3	56.4	55.24	50.1
16	135	371	1541		4476	1.2	4.8	6.0	56.3	55.15	50.31
16	138	364	1536		4476	1.2	4.7	5.8	56.3	55.15	50.48
16	141	364	1500		4500	1.2	3.0	4.1	56.3	55.15	52.2

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
17	0	444	1500		4739	1.2	2.2	3.4	56.3	55.08	52.86
17	3	476	1442		4739	1.2	2.2	3.4	56.3	55.13	52.95
17	6	508	1383		4907	1.1	2.4	3.5	56.3	55.19	52.83
17	9	540	1325		4907	1.0	2.8	3.8	56.3	55.28	52.53
17	12	571	1267		5035	0.9	2.9	3.8	56.3	55.38	52.48
17	15	571	1267		5035	0.9	3.0	3.9	56.3	55.38	52.38
17	18	590	1222		5035	0.9	2.9	3.8	56.3	55.41	52.49
17	21	610	1178		5016	0.9	3.3	4.2	56.3	55.45	52.13
17	24	629	1134		5016	0.8	3.0	3.8	56.3	55.5	52.51
17	27	648	1090		5016	0.8	2.7	3.5	56.3	55.55	52.84
17	30	667	1045		5213	0.7	2.8	3.5	56.3	55.6	52.81
17	33	667	1045		5213	0.7	2.8	3.5	56.3	55.6	52.83
17	36	664	1106		5213	0.7	2.9	3.7	56.2	55.46	52.52
17	39	661	1167		5132	0.8	3.1	3.9	56.2	55.41	52.3
17	42	658	1228		5132	0.8	2.9	3.7	56.2	55.37	52.48
17	45	656	1289		5188	0.9	3.1	4.0	56.2	55.33	52.25
17	48	653	1350		5188	0.9	2.9	3.8	56.2	55.28	52.42
17	51	653	1350		5188	0.9	3.1	4.1	56.2	55.28	52.15
17	54	631	1380		5188	1.0	2.8	3.7	56.2	55.25	52.5
17	57	610	1410		5188	1.0	2.5	3.5	56.2	55.23	52.73
17	60	588	1440		5188	1.0	2.5	3.5	56.2	55.21	52.75
17	63	567	1470		5188	1.0	2.4	3.4	56.1	55.09	52.72
17	66	545	1500		5109	1.0	2.1	3.1	56.1	55.08	53.03
17	69	545	1500		5109	1.0	2.1	3.1	56.1	55.08	53.03
18	0	400	1714		4284	1.2	1.4	2.6	56.1	54.92	53.48
18	3	411	1639		4334	1.2	2.1	3.3	56.1	54.94	52.85
18	6	422	1563		4384	1.1	2.7	3.8	56.2	55.06	52.41
18	9	433	1487		4384	1.1	2.7	3.8	56.2	55.09	52.38
18	12	444	1412		4384	1.1	2.0	3.1	56.2	55.12	53.11
18	15	444	1412		4384	1.1	1.3	2.3	56.2	55.12	53.86
18	18	431	1451		4384	1.1	2.5	3.6	56.2	55.09	52.57
18	21	417	1490		4297	1.1	2.2	3.4	56.2	55.07	52.85
18	24	403	1529		4297	1.2	3.2	4.4	56.2	55.05	51.82
18	27	389	1568		4297	1.2	2.9	4.1	56.2	55.03	52.11
18	30	375	1607		4297	1.2	2.6	3.8	56.2	55.02	52.44
18	33	375	1607		4297	1.2	2.3	3.5	56.2	55.02	52.73
18	36	386	1719		4297	1.2	2.9	4.1	56.2	55.01	52.1
18	39	398	1831		4091	1.2	4.3	5.5	56.2	55	50.75
18	42	409	1944		4091	1.2	3.5	4.7	56.2	54.99	51.47
18	45	420	2056		4091	1.2	3.3	4.6	56.3	55.08	51.74
18	48	431	2168		4148	1.2	5.8	7.1	56.3	55.08	49.24
18	51	431	2168		4148	1.2	5.2	6.4	56.3	55.08	49.93
18	54	425	2054		4148	1.2	3.8	5.0	56.3	55.1	51.34
18	57	418	1941		4148	1.2	2.6	3.8	56.3	55.11	52.5
18	60	412	1827		4148	1.2	4.2	5.4	56.3	55.13	50.93
18	63	406	1714		3953	1.2	4.1	5.2	56.3	55.15	51.09
18	66	400	1600		3953	1.1	4.0	5.1	56.3	55.16	51.16
18	69	400	1600		3953	1.1	2.9	4.0	56.3	55.16	52.31
19	72	400	1535		3822	1.2	2.3	3.5	56.3	55.13	52.81
19	75	400	1605		3822	1.2	2.9	4.1	56.4	55.23	52.29
19	78	401	1675		3822	1.2	3.1	4.3	56.4	55.23	52.09
19	81	401	1745		3869	1.2	4.4	5.6	56.5	55.32	50.94
19	84	401	1816		3917	1.2	4.5	5.6	56.5	55.32	50.86
19	87	402	1886		3965	1.2	4.5	5.7	56.6	55.41	50.89
19	90	402	1886		3965	1.2	4.8	5.9	56.6	55.41	50.66
19	93	467	1833		3965	1.3	5.2	6.5	56.7	55.43	50.2
19	96	533	1781		3965	1.3	5.3	6.6	56.7	55.37	50.08
19	99	598	1729		3848	1.4	4.9	6.3	56.8	55.45	50.54
19	102	664	1676		3731	1.4	4.5	5.9	56.8	55.45	50.92
19	105	730	1624		3731	1.3	3.6	4.9	56.9	55.58	51.97
19	108	730	1624		3731	1.3	2.3	3.6	56.9	55.58	53.26
19	111	687	1696		3731	1.3	2.4	3.7	57	55.72	53.34
19	114	645	1768		3711	1.3	2.4	3.7	57	55.75	53.32
19	117	602	1840		3711	1.2	2.5	3.7	57.1	55.89	53.42

Seismic Spread	Distance	Velocity Layer 1	Velocity Layer 2	Velocity Layer 3	Velocity Layer 4	Thickness Layer 1	Thickness Layer 2	Thickness Layers 1 +	Elevation	Base Layer 1	Base Layer 2
No.	(m)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(MSL)	(MSL)	(MSL)
19	120	559	1911		3711	1.2	3.0	4.2	57.1	55.93	52.95
19	123	517	1983		3711	1.1	3.5	4.7	57.1	55.98	52.45
19	126	517	1983		3711	1.1	4.0	5.1	57.2	56.08	52.09
19	129	514	1949		3711	1.1	3.2	4.3	57.2	56.06	52.86
19	132	510	1915		3632	1.2	3.5	4.7	57.3	56.14	52.61
19	135	507	1880		3535	1.2	3.8	5.0	57.3	56.12	52.31
19	138	503	1846		3535	1.2	3.1	4.3	57.4	56.2	53.08
19	141	500	1846		3535	1.2	3.5	4.7	57.4	56.21	52.75

Appendix 5

Rock Test Records

POINT LOAD STRENGTH INDEX TEST DATA

Contract: N6 Galway Transport Project (Phase 2)
Date of test: 18/11/15

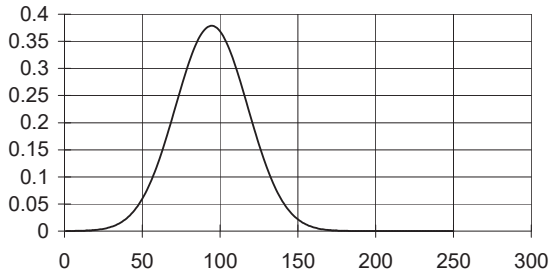
Sample Type: Core
Contract no. 18746

RC No.	Depth m	D (Diameter) mm	P (failure load) kN	F	Is (index strength) Mpa	Is(50) (index strength) Mpa	*UCS MPa	Type	Orienation
RC02/01	3.3	78	22.0	1.222	3.62	4.42	88	PL	90°
	6.2	78	10.0	1.222	1.64	2.01	40	PL	90°
	6.6	78	24.0	1.222	3.94	4.82	96	PL	90°
	13.1	78	29.0	1.222	4.77	5.82	116	PL	90°
	13.4	78	21.0	1.222	3.45	4.22	84	PL	90°
	16.8	78	22.0	1.222	3.62	4.42	88	PL	90°
RC02/02	7.9	78	24.0	1.222	3.94	4.82	96	PL	90°
	15.3	78	19.0	1.222	3.12	3.81	76	PL	90°
	15.7	78	27.0	1.222	4.44	5.42	108	PL	90°
	19.2	78	29.0	1.222	4.77	5.82	116	PL	90°
RC02/03	7.4	78	27.0	1.222	4.44	5.42	108	PL	90°
	7.8	78	27.0	1.222	4.44	5.42	108	PL	90°
	9.4	78	24.0	1.222	3.94	4.82	96	PL	90°
	13.0	78	26.0	1.222	4.27	5.22	104	PL	90°
	17.3	78	29.0	1.222	4.77	5.82	116	PL	90°
	17.7	78	28.0	1.222	4.60	5.62	112	PL	90°
	19.5	78	27.0	1.222	4.44	5.42	108	PL	90°
RC02/04	5.6	78	32.0	1.222	5.26	6.42	128	PL	90°
	10.5	78	27.0	1.222	4.44	5.42	108	PL	90°
	13.3	78	15.0	1.222	2.47	3.01	60	PL	90°
	13.7	78	14.0	1.222	2.30	2.81	56	PL	90°
	14.4	78	15.0	1.222	2.47	3.01	60	PL	90°

Statistical Summary Data	Is(50)	UCS*
Number of Samples Tested	22	22
Minimum	2.01	40
Average	4.73	95
Maximum	6.42	128
Standard Dev.	1.16	23
Upper 95% Confidence Limit	7.00	139.97
Lower 95% Confidence Limit	2.46	49.13

Comments:
*UCS taken as k x Point Load Is(50): k= 20

*UCS Normal Distribution Curve



Abbreviations	
i	irregular
a	axial
b	block
d	diametral

approx. orientation to planes of weakness/bedding

U	unknown
P	perpendicular
//	parallel

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/01
Depth (m):	6.3m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

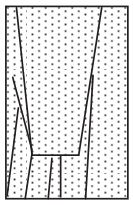
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	201	
Diameter (Ø)	78.1	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	322	kN

Strength Calculations

$$\text{Uniaxial Compressive Strength} = \frac{322000}{4788.19385}$$

$$= \frac{1000 \times P}{\prod \times (Ø/2)^2}$$

$$= 67.21 \text{ (Mpa)}$$

$$\text{Bulk Density} = 2.67 \text{ (Mg/m}^3\text{)}$$

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/01
Depth (m):	13.0m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

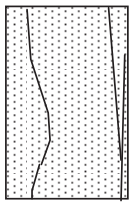
Weathering Grade Criteria

I. Fresh: Unchanged from original state
II. Slightly weathered: Slight discolouration, slight weakening
III. Moderately weathered: Considerable weakening, penetrative discolouration
IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	198	
Diameter (Ø)	78	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	249	kN

Strength Calculations

Uniaxial Compressive Strength $= \dfrac{249000}{4775.94}$

$= \dfrac{1000 \times P}{\prod \times (Ø/2)^2}$

$=$ 52.11 (Mpa)

Bulk Density $=$ 2.65 (Mg/m^3)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/02
Depth (m):	15.5m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

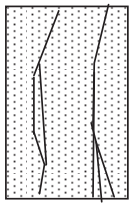
Weathering Grade Criteria

I. Fresh: Unchanged from original state
II. Slightly weathered: Slight discolouration, slight weakening
III. Moderately weathered: Considerable weakening, penetrative discolouration
IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	199	
Diameter (Ø)	78	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	368	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{368000}{4775.94}$

$= \frac{1000 \times P}{\prod \times (Ø/2)^2}$

= 77.01 (Mpa)

Bulk Density = 2.67 (Mg/m^3)

Notes:

Uniaxial Compression Test Report Sheet | *I.G.S.L.*

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/03
Depth (m):	7.6m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

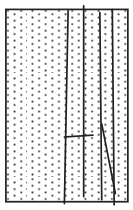
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	196	
Diameter (Ø)	77.9	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	255	kN

Strength Calculations

$$\text{Uniaxial Compressive Strength} = \frac{255000}{4763.70185}$$

$$= \frac{1000 \times P}{\prod \times (Ø/2)^2}$$

$$= 53.50 \text{ (Mpa)}$$

$$\text{Bulk Density} = 2.65 \text{ (Mg/m}^3\text{)}$$

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/03
Depth (m):	17.4m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

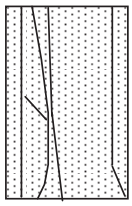
Weathering Grade Criteria

I. Fresh: Unchanged from original state
II. Slightly weathered: Slight discolouration, slight weakening
III. Moderately weathered: Considerable weakening, penetrative discolouration
IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	198	
Diameter (Ø)	78	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	238	kN

Strength Calculations

Uniaxial Compressive Strength $= \dfrac{238000}{4775.94}$

$= \dfrac{1000 \times P}{\prod \times (Ø/2)^2}$

= 49.81 (Mpa)

Bulk Density = 2.62 (Mg/m^3)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name:	N6 Galway Transport Project (Phase 2)
Job Number:	18746
Hole No:	RC02/04
Depth (m):	13.5m

Sample Description

Colour:	Pale Grey
Grain size:	Fine grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

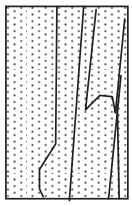
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	197	
Diameter (Ø)	78	mm

Sketch of Failure Surfaces



Testing

Load Rate	3.3	kN/min
Load at Failure (P)	166	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{166000}{4775.94}$

$= \frac{1000 \times P}{\prod \times (Ø/2)^2}$

= 34.74 (Mpa)

Bulk Density = 2.67 (Mg/m^3)

Notes:

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-01**
		SHEET	Sheet 1 of 4
CO-ORDINATES		**DATE DRILLED**	22/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	22/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								Driller reports overburden				
1												
2												
3									3.00			
								Driller reports LIMESTONE				
4												
5												
6												
7												
8												
9												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
22-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-01**
		SHEET	Sheet 2 of 4
CO-ORDINATES		**DATE DRILLED**	22/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	22/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								Driller reports LIMESTONE *(continued)*				
11												
12												
13												
14												
15												
16												
17												
18												
19												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
22-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-01**
		SHEET	Sheet 3 of 4
CO-ORDINATES		**DATE DRILLED**	22/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	22/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20								Driller reports LIMESTONE *(continued)*				
21												
22												
23												
24												
25												
26												
27												
28												
29												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
22-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL_RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RP-2-01**
SHEET Sheet 4 of 4

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Mack Truck
FLUSH Air Percussive
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 22/09/2015
DATE LOGGED 22/09/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY Mulcair Drilling
LOGGED BY JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
30								Driller reports LIMESTONE *(continued)*				
31												
32												
33												
34												
35									35.00			
								End of Borehole at 35.00 m				
36												
37												
38												
39												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
22-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-03**
		SHEET	Sheet 1 of 4
CO-ORDINATES		**DATE DRILLED**	21/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	21/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								Driller reports overburden				
1												
2												
3									3.00			
								Driller reports LIMESTONE				
4												
5												
6												
7												
8												
9												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
21-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-03**
		SHEET	Sheet 2 of 4
CO-ORDINATES		**DATE DRILLED**	21/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	21/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								Driller reports LIMESTONE *(continued)*				
11												
12												
13												
14												
15												
16												
17												
18												
19												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
21-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-03**
		SHEET	Sheet 3 of 4
CO-ORDINATES		**DATE DRILLED**	21/09/2015
GROUND LEVEL (mOD)		**RIG TYPE**	Mack Truck
		FLUSH	Air Percussive
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DATE LOGGED	21/09/2015
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20								Driller reports LIMESTONE *(continued)*				
21												
22												
23												
24												
25												
26												
27												
28												
29												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
21-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RP-2-03**
SHEET Sheet 4 of 4

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Mack Truck
FLUSH Air Percussive
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 21/09/2015
DATE LOGGED 21/09/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY Mulcair Drilling
LOGGED BY JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
30								Driller reports LIMESTONE *(continued)*				
31												
32												
33												
34												
35									35.00			
								End of Borehole at 35.00 m				
36												
37												
38												
39												

REMARKS

Rotary percussive methods to 35m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
21-09-15	35.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-04**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
CLIENT	Galway County Council	**DRILLED BY**	Mulcair Drilling
ENGINEER	ARUP	**LOGGED BY**	JL
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)			

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								Driller reports peaty overburden				
1												
									2.00			
2								Driller reports MARL				
3												
									4.00			
4								Driller reports coarse grained gravelly SAND				
5												
6												
7									7.50			
								End of Borehole at 7.50 m				
8												
9												

REMARKS

Rotary percussive methods to 7.50m depth bgl. Percussive drilling suspended after observing minor sinkholes developing in proximity to the rig. Presumed initiated by compressed air-supported drilling. Borehole backfilled with arisings.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

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GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-05**
		SHEET	Sheet 1 of 5
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								Driller reports overburden				
1									1.50			
								Driller reports LIMESTONE				
2												
3												
4												
5												
6												
7												
8												
9												

REMARKS

Rotary percussive methods to 45m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	45.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-05**
		SHEET	Sheet 2 of 5
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								Driller reports LIMESTONE *(continued)*				
11												
12												
13												
14												
15												
16												
17												
18												
19												

REMARKS

Rotary percussive methods to 45m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	45.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-05**
		SHEET	Sheet 3 of 5
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20								Driller reports LIMESTONE *(continued)*				
21												
22												
23												
24												
25												
26												
27												
28												
29												

REMARKS

Rotary percussive methods to 45m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	45.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-05**
		SHEET	Sheet 4 of 5
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
30								Driller reports LIMESTONE *(continued)*				
31												
32												
33												
34												
35												
36												
37												
38												
39												

REMARKS

Rotary percussive methods to 45m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	45.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RP-2-05**
SHEET Sheet 5 of 5

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Mack Truck
FLUSH Air Percussive
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 23/09/2015
DATE LOGGED 23/09/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY Mulcair Drilling
LOGGED BY JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
40								Driller reports LIMESTONE *(continued)*				
41												
42												
43												
44												
45									45.00			
								End of Borehole at 45.00 m				
46												
47												
48												
49												

REMARKS

Rotary percussive methods to 45m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	45.00	1.00	35.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT	N6 Galway Transport Project (Phase 2)	**DRILLHOLE NO**	**RP-2-05A**
		SHEET	Sheet 1 of 2
CO-ORDINATES		**DATE DRILLED**	23/09/2015
GROUND LEVEL (mOD)		**DATE LOGGED**	23/09/2015
RIG TYPE	Mack Truck		
FLUSH	Air Percussive		
CLIENT	Galway County Council	**INCLINATION (deg)**	-90
ENGINEER	ARUP	**CORE DIAMETER (mm)**	
		DRILLED BY	Mulcair Drilling
		LOGGED BY	JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								Driller reports overburden				
1									1.50			
2								Driller reports LIMESTONE				
3												
4												
5												
6												
7												
8												
9												

REMARKS

Rotary percussive methods to 12m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	12.00	1.00	12.00	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 18746

CONTRACT N6 Galway Transport Project (Phase 2)

DRILLHOLE NO **RP-2-05A**
SHEET Sheet 2 of 2

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Mack Truck
FLUSH Air Percussive
INCLINATION (deg) -90
CORE DIAMETER (mm)

DATE DRILLED 23/09/2015
DATE LOGGED 23/09/2015

CLIENT Galway County Council
ENGINEER ARUP

DRILLED BY Mulcair Drilling
LOGGED BY JL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								Driller reports LIMESTONE *(continued)*				
11												
									12.00			
12								End of Borehole at 12.00 m				
13												
14												
15												
16												
17												
18												
19												

REMARKS

Rotary percussive methods to 12m depth bgl. 50mm diameter well installed in rotary percussive hole following completion of drilling.

WATER STRIKE DETAILS

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

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
23-09-15	12.00	1.00	12.00	50mm SP

IGSL RC FI 10M 18746.GPJ IGSL.GDT 9/11/15