GROUND INVESTIGATION AT PROPOSED LANDFILL SITES

Report No. JBA2901-10/EIS/dl/tp

1

a la ch

December 2004

stigat uract No. (, ßlessington, Ct On Behalf Of John Barnett & Associat Consulting Engineers For the provided of the provide **Ground Investigation** IGSL Contract No. 8969 Roadstone, Blessington, Co. Wicklow On Behalf Of ÷ John Barnett & Associates

FOREWORD

Notes on Site Investigation Procedure

The following notes should be read in conjunction with the report. Any modifications to the procedures outlined below are indicated in the main text.

<u>GENERAL</u>

The recommendations made and opinions expressed in the Report are based on the "Boring Records, an examination of samples and results of the site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the boreholes, for example, between borehole positions. Whilst the report may express an opinion on a possible configuration of strata both between borehole positions and below the maximum depth of the investigation, this is for guidance only and no liability can be accepted for its accuracy.

BORING TECHNIQUE

Unless otherwise stated the 'Shell and Auger' technique of soft ground boring has been employed. Whilst this technique allows the maximum data to be obtained on strata conditions, a degree of mixing of some layered soils, (e.g. thin layers of coarse and fine granular material) is inevitable. Specific attention is drawn to this factor where evidence of such a condition is available.

GROUND WATER

The ground water conditions entered on the Boring Records are those appertaining at the time of the investigation. The normal rate of boring does not usually permit the recording of an equilibrium water level for any one water strike. Moreover, ground water levels are subject to variations caused by seasonal effects or changes in local drainage conditions. The table of each Boring Record shows the ground water level at the quoted borehole and casing depths, usually at the start of the day's work. The word "none" indicates that ground water was sealed off by the borehole casing.

GAS MONITORING

Unless otherwise stated gas monitoring is carried out using a GA2000 infra red gas detector. The gases monitored for and levels noted are recorded and plotted on the relevant test data sheets. Unless stated otherwise no monitoring is carried out for gas pressure or to calculate gas flow rates.

ROUTINE SAMPLING

Undisturbed samples of predominantly cohesive soils are obtained in a 102mm diameter open-drive sampler, complying with the requirements of the British Standard Code of Practice B.S. 5930. Large disturbed samples of granular soils, or of soils in which undisturbed sampling is not possible or appropriate, are taken from the boring tools and sealed into polythene bags. Small disturbed samples are taken at frequent intervals and sealed into 0.5 kg glass jars or polythene bags for subsequent visual classification. Where encountered in sufficient quantity, samples of groundwater are taken.

Unless otherwise stated in the main text, disturbed soil samples may not be at their natural water content.

REPORT ON A GROUND INVESTIGATION AT ROADSTONE QUARRIES, GLENDING, CO. WICKLOW ON BEHALF OF JOHN BARNETT & ASSOCIATES CONSULTING ENGINEERS

REPORT NO. 8969

OCTOBER 2003

I.INTRODUCTION

The site is located in the Roadstone Quarry at Glending, Blessington, Co. Wicklow.

An investigation of sub-soil conditions was ordered by the projects consulting engineers, John Barnett & Associates (JBA), on behalf of their clients, Roadstone Limited.

As part of an ongoing site investigation IGSL were requested to remobilise to site and carry out additional boreholes and testing at locations specified by the projects engineers. Previous investigative works were carried out by IGSL in May 2003 and reported on in IGSL report no. 8669.

This programme of the investigation included,

- ✓ The construction of two exploratory boreholes to establish stratification. During the course of boring in-situ tests were performed at regular intervals and representative soil samples were recovered for visual examination and laboratory analysis.
- ✓ The excavation of four trial pits using a hydraulic excavator. All pits were logged and sampled by an IGSL engineer and a representative of JBA.
- ✓ The installation of combined gas and groundwater monitoring standpipes at selected borehole locations.
- ✓ The carrying out in situ tests at both locations including variable head permeability tests and in situ gas monitoring.
- \checkmark The carrying out of laboratory soils testing (Geotechnical) as specified by the projects engineers.

This report deals with the factual findings of the ground investigation works.

II.FIELDWORK

The site is referred to as the Roadstone Glending site. The locations of all of the investigation points were marked on site by a representative of the projects engineers and are not included in this report.

The methods utilised during the course of the field investigations are outlined in the following sections.

Cable Tool Boreholes.

Conventional cable tool techniques (shell and auger) were employed at two locations across the site . All field work was carried out in accordance with BS5930.

Sampling and in - situ testing were performed to BS1377. Disturbed and undisturbed soil samples were taken at regular intervals or at changes in stratification while standard penetration tests (SPT's) were also carried out to establish relative in - situ soil strength.

Full details of stratification, testing, sampling, comments on groundwater and notes on any obstructions to normal boring encountered are given in the detailed borehole records enclosed in Appendix I to this report. It should be noted that the ground conditions necessitated the use of a considerable amount of hard strata boring and in places required the casing diameters to be increased from 200mm to 250mm.

Groundwater standpipes were installed in selected boreholes. Standpipes were installed to the specifications of the projects engineers. Where standpipes were not installed the boreholes were grouted with a cement bentonite based grout material. Variable head permeability tests were carried out in the standpipes and are reported on in Appendix III to this report.

At each location the borehole equipment was steam cleaned prior to drilling commencing. This was carried out to ensure that no cross contamination occurred between borehole positions.

III. TESTING

During the course of the investigation samples of the sub soils were taken from the boreholes and were returned to IGSL's laboratory where a programme of testing was scheduled by the projects engineers, John Barnett & Associates.

<u>Geotechnical Testing – Soils</u>

All of the geotechnical test data is included in Appendix IV to this report.

Tests carried out included

- ✓ Moisture Content Tests
- only, any other ✓ Atterburg Limits (Classification tests)
- ✓ Particle Size Distribution Tests (Wet Sieve)
- ✓ Sedimentation Analysis (by Hydrometer).
- ✓ Organic Content Tests
- ✓ PH and Sulphate Tests
- ✓ CBR Analysis

<u>In Situ Tests</u>

1. Standard Penetration Tests

The relative in-situ strength of the sub-soils was established at intervals by cone penetration test.

A solid conical point is hammered into the soil and the blow count for 300mm of penetration is recorded in four 75mm increments. Results are presented in the right - hand column of the boring and records.

SPT tests were carried out at intervals specified by JBA.

APPENDIX I operate CABLE TOOL BOREHOLE

REPORT NO: 8969 G	EOTECHNICA	LBC	RINC	RECO	ORD		IGSL	
CONTRACT : Roadstone Wicklow					BORE Sheet	HOLE NO 1 of 3	: BHL1	
CLIENT: Roadstone	GROUND LEVEL (mC	DD) FB (mm	-))	DATE	STARTED): 01/08	/2003
	BOREHOLE DEPTH	(m)	25.	00	PODE		Colline	/2003
CU-ORDINATES : N -	CASING DEPTH (m)		25.	00	BURE		.Collins	
S E DESCRIPTION	END	()	E H	BER	<u>พศ (25</u>	E	D TEST ULTS	ALS
	FEG	EIE)	DEP	NUN	SAM TYP	Ê E	RES	DET
TOPSOIL			0.20					
Firm brown sandy gravelly CLAY with cobble boulders	as and							
							[
-1				8845	в	1.00	N=22	
-2							Ì	
							l	
3		:		8846	в	3.00		
				ļ				
				× 158				
-4				8847	D	4.00	N=15	
			South	SIL 3				
		TRO S	tiredt					
		on Put res	× I	0949	P	5.00		
		OWNE		0040	D	5.00		
Very dense brown grey fing to pooreo cand			5.50					
GRAVEL with boulders	. S. O							
- 6	ment							
	C							
			Ì					
				8849	в	7.00	N=83	
					}			
- 8				8850	n	8.00		
						0.00		
-9				8851	B	9.00		
		2						
-1p Continued next sheet		<u>2</u>		<u> </u>			N=69/	
Hard Strata Boring / Chisellir	ng comments	Wate	ər <u>C</u> asi	Wate	er Strike E Rise	Details Time	Commen	ts
6.30 6.50 1.00 . 10.40 10.70 1.00 .		21.50	e Dep 21.5	tn At 10 -	<u>20.00</u> 20.00	20 20		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$								
				Ground le Casino	dwater Ot	servation	Sommente	
Standpipe Installation Detail	s se Type	08/08/2	De 003 25.0	oth Depth 00 25.00	Water 22.50	<u> </u> '		
u8/08/2003 25.00 21.00 25.00	SP	L			<u> </u>			

Remarks: Borehole blowing from 22.5-25.0m

REPORT NO: 8969 G	EOTECHNIC	AL BO	RING	RECO	RD		IGSL	
CONTRACT : Roadstone Wicklow					BOREH Sheet 2	OLE NO: 2 of 3	BHL1	
CLIENT : Roadstone ENGINEER : John Barrett & Associates	GROUND LEVEL (m BOREHOLE DIAME	10D) TER (mm)	- 200		DATE : DATE :	STARTED	: 01/08/200 ED: 08/08/200)3)3
CO-ORDINATES : E -	BOREHOLE DEPTH	l (m))	25.00 25.00)	BORE	DBY: M	.Collins	
		z	20.00	SA	MPLES		E s st	
DESCRIPTION	LEGEND	ELEVATI((mOD)	рертн (г	REF. NUMBER	SAMPLE TYPE	DEPTH (m)	FIELD TE RESULTS STAND P	DETAILS
Very dense brown grey fine to coarse sandy GRAVEL with boulders				2050	2	11.00		
				0002	В	11.00		
-12				8853	D	12.00		-
				8854	В	13.00	N=40/ 225mm	
- 14		CON PULPOS	ined for an	Note		15.00		
Dense brown fine to coarse silty SAND	Consent of consent	Sar	15.00	8825	в	15.00	N=39/ 225mm	
Very dense brown grey fine to coarse sandy GRAVEL with boulders	/		16.30	8856	в	17.00		
- 18								
- 1 9				8857	В	19.00	N=66	
Continued next sheet				8858	в	20.00		
Hard Strata Boring / Chisellin	lg	10/040	rl Canin	Wate	r Strike D	etails		
From (m) 10 (m) Hours Ca 6.30 6.50 1.00 . 10.40 10.70 1.00 . 11.60 11.80 1.00 . 16.30 16.60 1.00 . 23.00 23.50 2.00 .	Uniments	vvatel Strike 21.50 22.50	21,50 22,50		20.00 20.00	20 20 20	Comments	
T		Data	Hole	Ground Casing	Water Ob Depth to	servation	S Commente	
Standpipe Installation Details Date Tip Depth RZ Top RZ Bas 08/08/2003 25.00 21.00 25.00	s se Type SP	08/08/20	Dept 003 25.00	h Depth 25.00	Water 22.50			
		L			<u> </u>	L		

Domarka: Borobala blowing from 33 5 35 0r

RE	PORT N	0: 8969)	GE	OTECH	NICA	L BC	DRIN	G REC	ORD		IGSL	
co	NTRACT :	Roadstone	Wicklow							BORI Shee	EHOLE NO): BHL1	
CLI	ENT :	Roadstone	+ 0 A == 1-1	G		VEL (m	OD) IEB (mn	- n) 20	n	DATE	STARTE	D: 01/0	8/2003
		John Barret	L & ASSOCIATE	<u>=s</u> 2	OREHOLE	DEPTH	(m)	25	.00	ROP		A Colline	.0/2003
		<u>N-</u>		c	ASING DEF	>TH (m)		25	.00	SAMPLES			
DEPTH (M)		DES	CRIPTION			LEGEND	ELEVATION (mOD)	рЕРТН (m)	REF. NUMBER	SAMPLE	DEPTH (m)	FIELD TEST	STAND PIPI DETAILS
-21 -21 -22 -22 -23 24	Very dense GRAVEL v	e brown grey with boulders orehole at 25.	fine to coars	e sandy			on purp	esonitication direction 25.00	₹ ₹ 8859 8860 8861 8861 8862	W W B B	21.50 22.50 23.00 25.00	т ё N=50 N=51	
-26					Consert of	.00 yrite							
-29	From (m) 6.30 10.40 11.60 16.30 23.00	Hard St To (m) 6.50 10.70 11.80 16.60 23.50	rata Boring / Hours 1.00 1.00 1.00 2.00	Chiselling Corr	iments		Wat Stril 21.5 22.5	er Cas (e De 0 21 0 22	W sing Seale oth At 50 - 50 - 50 -	ater Strike ad Rise To 20.00 20.00	Details Time 20 20	Comm	ents
	L	Standn	ipe Installatio	on Details			Da	te H	ole Cas	ing Depth	to r	Comment	3
	Date 08/08/2003	Tip Depth 25.00	RZ Top 21.00	RZ Base 25.00	Type SP		08/08/2	2003 25	.00 25.0	00 22.50	·		
								l	<u>l</u>				
1 L	Remarks	Borehole bl	owing from 2	2.5-25.0m								E	PA Expo

ł

	REPORT NO: 8969	EOTECHN	ICA	L BO	RINC	RECO	DRD		IGSL	
L	CONTRACT : Roadstone Wicklow						BOREI Sheet	HOLE NO 1 of 2	BHL2	
L	CLIENT : Roadstone ENGINEER : John Barrett & Associates	BOREHOLE DIA	L (mC)	DD) ER (mm)	- 250		DATE	STARTED COMPLE): 28/07 TED: 12/08	/2003 /2003
ľ	CO-ORDINATES : E	BOREHOLE DE	PTH ((m)	20.0	00	BORE	DBY: M	.Collins	
F	N -	CASING DEPTH	1 (m)	z	20.0	JUS/	MPLES		E	Щ
DEDTH M	DESCRIPTION		TEGEND	ELEVATIO (mOD)	DEPTH (m	REF, NUMBER	SAMPLE TYPE	DEPTH (m)	FIELD TES RESULTS	STAND PIE DETAILS
	TOPSOIL Brown grey fine to coarse sandy GRAVEL				0.10	5978	в	1.00		
	Medium Dense grey brown fine to coarse sl silty SAND	ightly			1.80	5979 _	· B	3.50		
	5		60 10 10 10 10 10 10 10 10 10 10 10 10 10	on purpo	es only	5980	в	5.00	N=19 N=21	
	Brown SILT/CLAY	Consent of of			5.80 6.20	5981	в	6.00		
	Brown grey fine to coarse sandy GRAVEL cobbles Stiff brown sandy gravelly CLAY with occa cobbles	with sional			6.40	5982	В	7.00		
	-8 Stiff Brown SILT/CLAY			an and the second s	8.50	5984	U	8.90	N=31	
	Brown fine to coarse slightly silty SAND -10 Continued next sheet			- 	9.60	5985	B	10.00		
	Hard Strata Boring / Chiselli	ng Comments		Wate	r Casi	Wate Ing Sealed	er Strike D)etails	Commer	
(12.20 14.00 3.50 14.00 16.00 2.00 17.00 19.00 2.00			Strike 16.00		in <u>At</u>	To 11.50	20		
,	Standpipe Installation Detai Date Tip Depth RZ Top RZ Ba 11/08/2003 20.00 16.00 20.00	ils ase Type D SP		Date	e Ho Der	Groun le Casing oth Depth	dwater Ob Depth to Water	servation (s Comments	

I

F	EPORT NO: 8969 G	EOTECH	NICA	AL BC	RINC	RECC	RD		IGSL	
C	ONTRACT: Roadstone Wicklow						BORE Sheet	HOLE NO 2 of 2	BHL2	
C	LIENT : Roadstone	GROUND LE	VEL (m	OD)			DATE	STARTE): 28/07	7/2003
		BOREHOLE	DEPTH	(m)	20.0	, 00	DATE			5/2003
	N-	CASING DEF	TH (m)	 r	20.	00	BORE			
Ð,	DESCRIPTION		ę	NOIL	Ê	<u>SA</u>	MPLES		TEST) PIPE LS
É L	DESCRIPTION		EGEN	ELEVA mOD)		TEF.	SAMPI	H H H H H H H H H H H H H H H H H H H	leed Resul	STANE
-ip	Brown fine to coarse slightly silty SAND		**************************************							ח ר
			x * × × × x * × ×							
	Very Dense brown grey fine to coarse sandy		× * *		10.60					
F.	clay up to 12m and coarse sand blowing fro	nas of N							N=67	
	17.0m)					5986	в	11.30		
-12									!	
						5987	В	12.30		
]						
				-						
						se.				
						athert				
- 14					MIN'S	any				
				1	25 2 10					
				Purp	hill]				
	•		في	OWNER						
			19. 30 A. 19. 30			5988	в	15.30	N=75	
		Ŷ	- de fra				_			
ļ		ntof								
-1	3	conser								
ł		Ŭ								
ł										18
	7					5989	в	17.00	N=70	
T										日
ł										18
ł				1						18
ľ	8								1	日日
ł										日
ł								1		日日
-	9					5990	в	19.00	N=74	
ł										日日
ļ										日
ŧ							ł			日日
Ļ	End of Borehole at 20.00 m			<u>-</u>]	20.00)		<u> </u>		
	Hard Strata Boring / Chisellir From (m) To (m) Hours C	g omments	-	Wate	er Casi	Wate ng Sealed	Rise	Vetails Time	Commer	nts
ł	12.20 14.00 3.50 14.00 16.00 2.00			Strik 16.00	<u>e Depi</u> 16.0		11.50	20		
	17.00 19.00 2.00									
T						Ground	iwater Ob	servation	<u>s</u>	
	Standpipe Installation Detail		-1	Dat	e Ho Der	oth Depth	Water_		Comments	
	11/08/2003 20.00 16.00 20.00	SP								
				L				·		



REPORT NO). 8969	TRL	ALF	PIT	REC	CORD]	IGSI	
	Pondatono Ouerra					Trial Pit No).:	TPL	.1		
DNIKACI:		, ,		<u></u>		Sheet:		She	et 1 of 2	**	
LIENT:	Roadstone					Excavation	Method:				
NGINEER:	John Barnett & A	ssociates				Date Starte	d:	14/(08/2003		
	E -	<u> </u>				Date Comp	leted:	14/(08/2003		
O-ORDINATES:	<u>N -</u>					Ground Le	vel (mOD):				···
								Samples			Pa)
lepth (m)	Geotechnical I	Description	egend)epth (m)	levation (mOD)	Vater Strike (m)	tef. No.	Jype	Jepth (m)	'ane Test (KPa)	land Penetrometer (K
	ard medium dense g occasional cobbl medium dense lig VD with silt conter o containing occas ons, possible made	very gravelly SAND es ht brown/brown fine at increasing with ional thin ground		0.60	onsti as	Noter 1280.	6879 6880	в	1.00		
2.0		Consent of Co.		N. (.			6881	В	2.00		
- 3.0							6882 6883	В	3.00		
4.0 Continu	ed next sheet		x X X	×			6884	В	4.00		
Groundwater Con	nditions: No	groundwater was encounterd du	ring exca	avatio	1						
Stability:	 Tri	al pit remained open during exca	avation								
Remarks:	So	il became increasingly damp tow	vards the	base (of the pit	:			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

Quarry Att & Associates nical Description ase light brown/brown fine content increasing with goccasional thin made ground 30 m	Legend	(II) Jebty (II) 4.30	Elevation (mOD)	Trial Pit No Sheet: Excavation Date Starte Date Comp Ground Le	a Method: a Method: bleted: vel (mOD) N T 22	TPL Shee 14/0 14/0 : - Samples	1 et 2 of 2 08/2003 08/2003	Vane Test (KPa)	Hand Penetrometer (KPa)
Quarry Att & Associates nical Description ase light brown/brown fine content increasing with occasional thin made ground 30 m	Legend	(III) (IIII) (III)	Elevation (mOD)	Sheet: Excavation Date Starte Date Comp Ground Le	a Method: ed: oleted: ovel (mOD)	Shee 14/0 14/0 Samples	(II)	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description nical Description nical Description near the set of the set	Legend	(III) Depty (III)	Elevation (mOD)	Excavation Date Starte Date Comp Ground Le	a Method: ed: pleted: evel (mOD) on N jag	14/0 14/0 : - Samples	08/2003 08/2003 (II) Htta Q	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description use light brown/brown fine content increasing with coccasional thin made ground 30 m	Legend	(III) (IIII) (III)	Elevation (mOD)	Date Starte Date Comp Ground Le (E) synth S S S Street USE	ed: pleted: wel (mOD) o N j j j j j j j j j j j j j	14/0 14/0 : - Samples	08/2003 08/2003 (ม) มูน อา	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description nse light brown/brown fine content increasing with occasional thin made ground 30 m	Fegend	(III) theory (III)	Elevation (mOD)	Date Comp Ground Le (II) astrice Mater Use	oleted: vvel (mOD) vvel (mOD) Be ge K	I4/0	(m) the second s	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description ase light brown/brown fine content increasing with occasional thin made ground 30 m	Fegend	(III) Joeph (III)	Elevation (mOD)	Ground Le	(GOm) Isve	Samples	Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description ise light brown/brown fine content increasing with occasional thin made ground 30 m	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Samples	Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
nical Description ise light brown/brown fine content increasing with occasional thin made ground 30 m	Legend	(III) (IIII) (III)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	Hand Penetrometer (K
use light brown/brown fine content increasing with occasional thin made ground 30 m	- Criticon	4.30	only an	A diet use.					
	ection w	ourpose ourpose	only. an	3					
Consent of C	N. B. B. R. O.								
No groundwater was encounterd of the second	during exc	cavatio	n						
	No groundwater was encounterd Trial pit remained open during en Soil became increasingly damp to	Consent of C Consent of C No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the	No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the base of	No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the base of the pit	No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the base of the pit	No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the base of the pit	concernent	Conserved. Index of the pit Conserved. Index of the pit	No groundwater was encounterd during excavation Trial pit remained open during excavation Soil became increasingly damp towards the base of the pit

REPO	ORT NO. 8969	TRI	AL I	PIT	REC	CORD				IGSI	4
						Trial Pit N	0.:	TPI	.2		
DNTRA	ACI: Roadstone Qua	rry				Sheet:		She	et 1 of 1		
CLIENT:	Roadstone					Excavation	Method:		<u>-</u>		
ENGINE	ER: John Barnett &	Associates				Date Starte	ed:	14/	08/2003		
	E -					Date Com	pleted:	14/	08/2003		
	N -					Ground Le	vel (mOD)	-			
								Samples			(Pa)
Depth (m)	Geotechnica	l Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	Hand Penetrometer (K
	Topsoil Loose to medium dense l silty SAND with silt con depth also containing occ laminations, possible mat	ight brown/brown fine tent increasing with asional thin de ground		0.30							
-1.0		For .		Purpos	and for a	BA DE	6890 6891	В	1.00		
-2.0		Consent of		SKIPKIPKIPKIPKIPKIPKIPKIPK			6892	В	2.00		
-3.0							6893 6894	В	3.00		
<u>++4.0</u>	End of Trial Pit at 4.00	m	X	-4.(0.				<u> </u>		
Grou	ndwater Conditions:	Groundwater seepage at 3.0m									
Ctabi	lity:	Frial pit remained open during exca	avation								
Rem	arks:										

ł

NTRACT: Roadstone Quarry Thial Pit No: TPL3 Sheet: Sheet 1 of 2 EXENT: Roadstone GINEER: John Barnett & Associates ORDINATES: E - N - Geotechnical Description Geotechn	NTRACT: Roadstone Cuarty Seet 1 42 TexT: Roadstone Cuarty Seet 1 42 EEN: Roadstone Cuarty Seet 1 42 EEN: Roadstone Cuarty Seet 1 42 Steet: Steet 1 42 Date Strettet: 1408/2003 Count Lovel (mOD): Count		U. 8969 1	KIAL P	11	KEU	UKD	·····			1691	
Sheet: Sheet: Sheet 1 of 2 EENT: Roadstone Excavation Method: Date Stated: 14/08/2003 GRNEER: John Barnett & Associates Date Completed: 14/08/2003 ORDINATES: E - Geotechnical Description Date Completed: 14/08/2003 Geotechnical Description Image: State distribution of the state distribution o	Number of the set sheet Sheet:	ONTR & CTV	Roadstone Quarry			Ì	Trial Pit No	h.:	TPL	3		
EENT: Roadstome GINEER: John Barnett & Associates CONDENT: John Barnett & Associates CONDENT: John Barnett & Associates CONDENT: Local Description Control of the started: 14/08/2003 Date Completed: 14/08/2003 Control Level (mOD):	ENT: Roudstone IGNEDR: John Barnelt & Associates DORDINATES: E N - Coordinated Description Image: State of the		madolotic Quality				Sheet:		Shee	et 1 of 2		
GINERE: John Barnett & Associates HORDINATES: E - N - Geotechnical Description Geotechnical	CRINEER: John Barnet & Associates Date Starter: 14/08/2003 OORJINATES: E Samples Date Starter: 14/08/2003 ORDINATES: E Samples Samples Geotechnical Description Image: Samples Samples Image: Samples Topsoil Image: Samples Samples Image: Samples Image: Samples Image: Samples Image: Samples Image: Samples Image: Samples Image: Sampl	JENT:	Roadstone				Excavation	Method:				
Bate Completed: 14/08/2003 Geotechnical Description Geotechnical Description Samples Geotechnical Description Image: Completed in the second se	DORDINATIS: E Due Completed: 1408/2003 ORDINATIS: N Due Completed: 1408/2003 Geoschnical Description Image: Completed: Samples Geoschnical Description Image: Completed: Samples Topsoil Image: Completed: Image: Completed: Image: Completed: Does to medium dense light brown/brown fine sity SAND with sit content increasing with depth also containing occasional thin laminations, possible made ground Ocfo Image: Completed: Image: Completed: 2.0 Continued next sheet Geoschnical text (model) Geoschnical text (model) Geoschnical Description Geoschnical Description Geoschnical Description	GINEER:	John Barnett & Associates				Date Starte	d:	14/0	8/2003		
Geotechnical Description Samples Geotechnical Description Image: Second Live (mOD): Geotechnical Description Image: Second Live (mOD): Geotechnical Description Image: Second Live (mOD): Topsoil Image: Second Live (mOD): Image: Second Live (mOD): Samples Image: Second Live (mOD): <td>Continued next sheet N Continued next sheet Continued next sheet</td> <td>DRDINATES</td> <td>E -</td> <td></td> <td></td> <td></td> <td>Date Comp</td> <td>leted:</td> <td>14/0</td> <td>18/2003</td> <td></td> <td></td>	Continued next sheet N Continued next sheet Continued next sheet	DRDINATES	E -				Date Comp	leted:	14/0	18/2003		
Geotechnical Description Geotechnical Description Topsoil Loose to medium dense light brown/brown fine sity SAND with silt content increasing with depth also containing occasional thin laminations, possible made ground content of the lamination of the lami	Geotechnical Description Geotechnical Descript		<u>N -</u>				Ground Le	vel (mOD):				
Geotechnical Description Image: Construct of the second	Geotechnical Description Image: Continued next sheet								Samples			
Topsoil Loose to medium dense light brown/brown fine silty SAND with silt content increasing with depth also containing occasional thin laminations, possible made ground 2.0 Content of the second depth	10 Topsoil Loose to medium dense light brown/brown fine silty SAND with silt contant increasing with depth also containing occasional thin laminations, possible made ground 0.60 1.0 6873 B 1.0 6873 B 2.0 Construed next sheet	nchu (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	
	3.0 6874 B 3.00 6875 B 3.00 Continued next sheet	2.0	o medium dense light brown/brown fine ND with silt content increasing with so containing occasional thin ions, possible made ground	Forth Cont	0.60	only e	ny other use.	6873 6877 6878	в	1.00		

RI	EPORT NO. 8969	TRI	AL	PIT	REC	CORD				IGSI	
						Trial Pit N	0.:	TP	L3	·	
	NTRACT: Roadstone Quarry					Sheet:		Sh	eet 2 of 2		
CLI	ENT: Roadstone					Excavation	Method:				
ENG	GINEER: John Barnett & A	ssociates				Date Starte	ed:	14	/08/2003		
	OPDINATES. E -	<u> </u>				Date Com	pleted:	14	/08/2003		
	N -					Ground Le	vel (mOD)				
								Samples	5		Pa)
Depth (m)	Geotechnical D	escription	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	Hand Penetrometer (K)
	Loose to medium dense lig silty SAND with silt conter depth also containing occas laminations, possible made End of Trial Pit at 4.20 m	nt brown/brown fine tt increasing with ional thin ground		4.20		13 ⁸ .	6876	В	4.20		
	.0	Consent of cons	rection rest of	den lose	patt. at	Notice C					
	8.0										
	Groundwater Conditions: No	groundwater was encountered o	luring ex	xcavati	on						
	Stability: Tri	al pit remained open during exc	avation								
	Remarks:										

REI	PORT NO	. 8969	TR	IAL I	PIT	REC	ORD				IGSI	<u></u>
···		n. 1 0					Trial Pit No	.:	TPI	A		
DNT	RACT:	Roadstone Quarry	·				Sheet:		She	et 1 of 1	·	
CLIEN	VT:	Roadstone					Excavation	Method:				
ENGII	NEER:	John Barnett & As	ssociates				Date Starte	d:	14/	08/2003		
		E -	·····				Date Comp	leted:	14/	08/2003		
	RDINATES:	N -	· · · · · · · · · · · · · · · · · · ·				Ground Lev	vel (mOD):			1/	
									Samples			(Pa)
Depth (m)		Geotechnical D	Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	Hand Penetrometer (F
0.0	Topsoil											
-1.0	Loose to r silty SAN depth also lamination	nedium dense lig D with silt conter containing occas ns, possible made	nt brown/brown fine tt increasing with ional thin ground		0.30	onth' as	Notice use.	6885 6886	В	1.00		
-2.0			Consent of C	Ŝ				6887	В	2.00		
-3.0								6888 6889	в	3.00		
-4.0 Gı	End of T roundwater Con	rial Pit at 4.00 m ditions: Gro	oundwater seepage at 3.0m		4.(0						
	ability:	Tri	al pit became unstable from 3.	.0m								

APPENDIX HI IN SITU TEST RESULTS

通知的 高手 しょうがんかい

L	Var	iable Hea	d Permea	bility Test Report Sheet	I.G.S.L.
	CONTRACT:	Roadstone Wick	ow	TEST RESPONSE ZONE DETAIL	.S:
6	CLIENT:	Roadstone		Top (mbgl):	21.00
Į	ENGINEER:	John Barett & A	ssociates	Bottom (mbgl):	25.00
ի	OCATION:	Blessington Cou	nty Wicklow	Length (m):	4.00
ł	IOLE No.	BHL1		*** Diameter (m):	0.200
1	EST No.	1.00		Initial Standing Water Level	20.00
L				(m below top of casing):	
	Elapsed	Depth	Ht/Ho	Height of casing or standpipe :	0.50
ļ	Time	to Water*		above ground level (m)	A STATE OF STATE
L	(mins)	(m)		Falling or Rising Head Test?	Falling
	0.00	4.85	0.00		
I	1	5.30	0.97	1.00 -	
	2	6.00	0.92		
	3	6.20	0.91		
ł	4	6.55	0.89		
	5	7.00	0.86		
	6	7.50	0.83		
	7	7.90	0.80		
l	8	8.35	0.77	<u>e</u> ·	_
L	9	8.75	0.74		
l	10	9.20	0.71	N. all or	
I	15	11.05	0.59	s of the second	
l	20	12.73	0.48	₽ ^{xel} xel	
	20	14.10	0.39		
	30	15.25	0.31	Ection whet	
	50	19 10	0.20	instato.	
	60	19.10	0.13	o bythe	
	00	1 10.10	0.00		
I			0.00		
			0.000		
l			0.00		
			0.00		
			0.00		
			0.00		
			0.00	0.10	
			0.00	0.00 20.00 40.00 6	80.00 80.00
			0.00	Time (min)	
1			0.00		
			0.00		
		· ·	0.00	Diameter of standpipe/borehole (m)	0.2
			0.00	A A A A A A A A A A A A A A A A A A A	= 0.03142
			0.00	Snape Factor (note 5)	= 7.75124
			0.00	Time to reach Ht/Ho = 0.37 (sec)	= 1577
			0.00	Extrapolated Yes/No	No No
				Coefficient of Permeability (A/FI) (m/s) K	= 2.57E-06
	NI at a a		0.00		

Depth of water below top of casing/standpipe

'A' is calculated from the standpipe or piezometer tube, or the borehole casing diameter if the test is carried out during the course of boring operations.

*** This is normally the diameter of the borehole since the response zone includes the gravel surround Time lag is taken as the elapsed time corresponding to a value of H/Ho = 0.37. If H/Ho does not reach 0.37, it will be necessary to extrapolate the graph and assess the time.

Var	iable Hea	d Permea	bility Test Report Sheet	I.G.S.L.
CONTRACT:	Roadstone Wick	low	TEST RESPONSE ZONE DETAIL	.S:
CLIENT:	Roadstone		Top (mbgl):	16.00
ENGINEER:	John Barrett & /	Associates	Bottom (mbgl):	20.00
LOCATION:	Blessington Cou	nty Wicklow	Length (m):	4.00
HOLE No.	BHL2		*** Diameter (m):	0.250
TEST No.	1.00		Initial Standing Water Level	12.50
			(m below top of casing):	
Elapsed	Depth	Ht/Ho	Height of casing or standpipe :	1.00
Time	to Water*		above ground level (m)	
(mins)	(m)		Falling or Rising Head Test?	Falling
0.03	2.60	1.00		
0.06	2.65	0.99	1.00 🖶	
0.09	2.70	0.99		
0.12	2.75	0.98		
0.15	2.82	0.98		
0.5	2.86	0.97		
1	3.00	0.96		
1.5	3.35	0.92		
2	3.40	0.92	© ·	
2.5	4.10	0.85	inter 1	
5	4.45	0.81	14. 19 OF	`
10	5.10	0.75	to the second se	
15	5.80	0.68	9 rogred	
20	6.90	0.57	S NULLES	
25	7.60	0.49	± ction thet	
30	8.80	0.37	115 dt O	
		0.00	of white	
· ·		0.00	4 ^{COY}	
1		0.00		
		0.00		
		0.00		
		0.00		
'		0.00		
		0.00	0.10	
		0.00		
		0.00	0.00 10.00 20.00 3	50.00 40.00
l l		0.00	Time (min)	
		0.00		
1	1	0.00	**Diameter of standpipe/borehole (m)	0.25
		0.00	** X-sectional area of BH/Standpipe A	= 0.04909
1		0.00	Shape Factor (note 5)	= 8.23939
1		0.00	Time to reach Ht/Ho = 0.37 (sec)	= 1782
		0.00	Extrapolated Yes/No	N
l	1	0.00	Coefficient of Permeability (A/FT) (m/s) k	(= 3.34E-06
		0.00		
Notes				

Depth of water below top of casing/standpipe

'A' is calculated from the standpipe or piezometer tube, or the borehole casing diameter if the test is carried out during the course of boring operations.

*** This is normally the diameter of the borehole since the response zone includes the gravel surround Time lag is taken as the elapsed time corresponding to a value of H/Ho = 0.37. If H/Ho does not reach 0.37, it will be necessary to extrapolate the graph and assess the time.

APPENDIX IV LABORATORY TEST RECORDS

			Determi	nation of Moistur	e Content	
			BS1	377:Part 2:1990, claus	es 3.2	
BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Description	
BH L1	8845	1.00	D	9.1	Grey brown slightly sandy slightly grave	IIIY CLAY
BH L1	8846	3.00	D	9.0	Grey brown slightly sandy gravelly CLA	Y
BH L1	8849	7.00	D	5.5	Grey sandy GRAVEL	
BH L1	8851	9.00	D	5.1	Grey sandy GRAVEL	
BH L2	8978	1.00	D	14.6	Brown clayey/silty very sandy GRAVEL	
BH L2	8979	3.50	D	24.0	Brown very silty SAND	
BH L2	5981	6.00	D	23.8 other	Brown slightly sandy slightly gravelly Cl	AY
BH L2	5983	8.90	D	on 19.5	Brown slightly sandy gravelly CLAY	
				-urpose inted		
			cito	A P rec		······································
			Thepto			
			FO DYLE			
		يوفأ	01			
		Con				
·		Contract		ROADSTO	NE WICKLOW	Contract No. 8969
	. .	Compiled By			Date	Page
IGS	SL [D	CONNOL	LY	08/10/03	of

[Summary of Classification Tests											
					BS	1377:Part 2:	1990, clauses	s 3.2, 4.3,	5.3 & 5.4			
BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	<425μm %	Preparation	Descripti	on	Classification
BH L1	8846	3.00	D	9	26	12	14	25.4	ws	Grey brown	slightly sandy gravelly CLAY	CL
BH L2	5979	3.50	D	24	27	NP		99.1	ws	Grey brown	very silty SAND	ML
BH L2	5981	6.00	D	23.8	25	13	12	87.7	WS	Brown slight	tly sandy slightly gravelly CLAY	CL
BH L2	5983	8.90	D	19.5	30	16	14	50.1	ws	Brown sand	y slightly gravelly CLAY	CL
									®			
							ļ	 	ther 115			
						1	ļ	Ma	and			
								COSES of the	·····			
						<u> </u>		Purcolu			·	
							RSPector ON	2r				
						<u> </u>	FOLUTION					
							tof C					
						Cons						
												·
										p		
										. <u> </u>		
						ľ				. <u></u>		
Notes: I	NAT - teste	d as rece	ived WS-	Wet sieved (425µm) N	P - Non Plas	tic					
			Contract			ROADS	TONE WICK	LOW			Contract No. 8969	
	IGSL	ŧ	Compiled B	y		Date	Checked By			Date	Page	
		D CONNOLLY 08/10/03				of						















Report No.		CALIFORNIA BEARING RATIO											
Contract	t:	ROAD	STONE WICKLOW	DATE	C	8/10/	/03		С	ONTR	ACT No	8969	
Location	Sample No.	Depth of Sample	Sample Description	Water Content %	Test Code	Water (Top %	Content Bottom %	Bulk Density Mg/M3	% Passing 20mm	Top %	C.B.R. Base %	Average %	
BH L1	8845	1.00	Grey brown slightly sandy slightly gravelly CLAY	9.1	L Ş ^e	9.2	9.0	2.29	78.1	2.2	3.3	2.8	
Test Code: 	JUndistu DDynamio StStatic c	rbed San c Compac compactic	nple L2.5Kg. Rammer A/55% Air Void ction H4.5Kg. Rammer A1010% Air Vo on RN29 Road N	s Ratio bids Ratio lote 29 (St. 9	V V M I 95% H	(ibrating Method I .)	Hammer Number						

REPORT NO.		SULF	PHATE AI	VALYSI	S			IGSL
CONTRACT:	ROADSTO	NE WICKLO	W					
BH/TP	DEPTH	SAMPLE	SAMPLE	TEST	SULPHUR TF	RIOXIDE	(so3 X 1.2)	pН
NO.	(M)	NO.	TYPE	CODE	WATER SO3 g/L	TOTAL SOIL so3 %	TOTAL SOIL so 4 %	VALUE
BH L1	1.00	8845	D	S				
BH L2	3.50	5979	D	S		0.01	0.012	8.0
			Consent of copy	ection purposes	NY. any offer the			
TEST CODE:	W = WA	TER	S = SOIL	A = AQUEC	OUS SOIL EXTRACT(2:1)		

i.

REPORT NO.			IGSL			
CONTRACT:	ROADSTON	E WICKLOW			<u></u>	
BOREHOLE NO.	SAMPLE NO.	DEPTH (METRES)	SAMPLE TYPE	% PASSING 2mm	ORGANIC CONTENT OF MATERIAL PASSING 2 mm %	REMARKS
BH L1	8845	1.00	D	46.3	1.37	
BH L2	5981	6.00	D	98.2	1.33	
		cos	For inspection purposes of	N. any offer use.		

(1+1) = (1+1

REPORT NO.		SULF	PHATE AI	VALYSI	S			IGSL
CONTRACT:	ROADSTO	NE WICKLO	W					
BH/TP	DEPTH	SAMPLE	SAMPLE	TEST	SULPHUR TR	IOXIDE	(so3 X 1.2)	рН
NO.	(M)	NO.	TYPE	CODE	WATER SO3 g/L	TOTAL SOIL 503 %	TOTAL SOIL so 4 %	VALUE
BH L1	1.00	8845	D	S		0.018	0.022	7.8
BH L2	3.50	5979	D	S		0.01	0.012	8.0
			Conse	for inspection	purposes only, any other use.			
TEST CODE:	W = WA	TER	S = SOIL	A = AQUE	OUS SOIL EXTRACT(2:1)		

.

05 MAR 2004

<u>,</u>5

5

IGSL Limited Glending Quarry, Blessington Project No. 9486 On Behalf Of John Barnett & Associates Of Consulting Engineers

FOREWORD

Notes on Site Investigation Procedure

The following notes should be read in conjunction with the report. Any modifications to the procedures outlined below are indicated in the main text.

GENERAL

The recommendations made and opinions expressed in the Report are based on the "Boring Records, an examination of samples and results of the site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the boreholes, for example, between borehole positions. Whilst the report may express an opinion on a possible configuration of strata both between borehole positions and below the maximum depth of the investigation, this is for guidance only and no liability can be accepted for its accuracy.

BORING TECHNIQUE

Unless otherwise stated the 'Shell and Auger' technique of soft ground boring has been employed. Whilst this technique allows the maximum data to be obtained on strata conditions, a degree of mixing of some layered soils, (e.g. thin layers of coarse and fine granular material) is inevitable. Specific attention is drawn to this factor where evidence of such a condition is available.

GROUND WATER

The ground water conditions entered on the Boring Records are those appertaining at the time of the investigation. The normal rate of boring does not usually permit the recording of an equilibrium water level for any one water strike. Moreover, ground water levels are subject to variations caused by seasonal effects or changes in local drainage conditions. The table of each Boring Record shows the ground water level at the quoted borehole and casing depths, usually at the start of the day's work. The word "none" indicates that ground water was sealed off by the borehole casing.

GAS MONITORING

Unless otherwise stated gas monitoring is carried out using a GA2000 infra red gas detector. The gases monitored for and levels noted are recorded and plotted on the relevant test data sheets. Unless stated otherwise no monitoring is carried out for gas pressure or to calculate gas flow rates.

ROUTINE SAMPLING

Undisturbed samples of predominantly cohesive soils are obtained in a 102mm diameter open-drive sampler, complying with the requirements of the British Standard Code of Practice B.S. 5930. Large disturbed samples of granular soils, or of soils in which undisturbed sampling is not possible or appropriate, are taken from the boring tools and sealed into polythene bags. Small disturbed samples are taken at frequent intervals and sealed into 0.5 kg glass jars or polythene bags for subsequent visual classification. Where encountered in sufficient quantity, samples of groundwater are taken.

Unless otherwise stated in the main text, disturbed soil samples may not be at their natural water content.

REPORT ON A GROUND INVESTIGATION AT ROADSTONE QUARRIES, GLENDING, CO. WICKLOW ON BEHALF OF JOHN BARNETT & ASSOCIATES CONSULTING ENGINEERS

5

REPORT NO. 9486

MARCH 20034

I.INTRODUCTION

The site is located in the Roadstone Quarry at Glending, Blessington, Co. Wicklow.

An investigation of sub-soil conditions was ordered by the projects consulting engineers, John Barnett & Associates (JBA), on behalf of their clients, Roadstone Limited.

As part of an ongoing site investigation IGSL were requested to remobilise to site and carry out additional boreholes and testing at locations specified by the projects engineers. Previous investigative works were carried out by IGSL in May 2003 and October 2003 and reported on in IGSL report no.s 8669 and 8969 respectively.

This programme of the investigation included,

- ✓ The construction of one exploratory borehole to establish stratification. During the course of boring in-situ tests were performed at regular intervals and representative soil samples were recovered for visual examination and laboratory analysis.
- ✓ The excavation of two trial pits using a hydraulic excavator. All pits were logged and sampled by an IGSL engineer and a representative of JBA.
- ✓ The carrying out of laboratory soils testing (Geotechnical) as specified by the projects engineers.

This report deals with the factual findings of the ground investigation works.

II.FIELDWORK

The site is referred to as the Roadstone Glending site. The locations of all of the investigation points were marked on site by a representative of the projects engineers and are not included in this report.

The methods utilised during the course of the field investigations are outlined in the following sections.

Cable Tool Boreholes.

Conventional cable tool techniques (shell and auger) were employed at one location across the site . All field work was carried out in accordance with BS5930.

Sampling and in - situ testing were performed to BS1377. Disturbed and undisturbed soil samples were taken at regular intervals or at changes in stratification while standard penetration tests (SPT's) were also carried out to establish relative in - situ soil strength.

Full details of stratification, resting, sampling, comments on groundwater and notes on any obstructions to normal boring encountered are given in the detailed borehole records enclosed in Appendix I to this report.

It should be noted that the ground conditions on previous works at Glending had necessitated the use of a considerable amount of hard strata boring and in places required the casing diameters to be increased from 200mm to 250mm. In this phase of works only 250mm diameter casing was used to drill the borehole.

III. TESTING

During the course of the investigation samples of the sub soils were taken from the boreholes and were returned to IGSL's laboratory where a programme of testing was scheduled by the projects engineers, John Barnett & Associates.

j,

Geotechnical Testing – Soils

All of the geotechnical test data is included in Appendix III to this report.

Ŀ.

Tests carried out included

✓ Moisture Content Tests

✓ Particle Size Distribution Tests (Wet Sieve)

✓ Sedimentation Analysis (by Hydrometer).

Appendix I – Cable: Tool Borehole Records Consent of copyright

Ъ

÷,

5

Ŀ,

REPORT NO: 9486 G	EOTECH	NICA	BO	RI	NG F	ECO	RD BORFH			d.
CONTRACT : Blessington Quarry	·						Sheet 1	of 2		
CLIENT : Roadstone Dublin Ltd.	GROUND LE	VEL (mO	D)		•	ł	DATES	STARTE	D: 10/0	2/2004
ENGINEER : John Barnett & Associates	BOREHOLE		:R (mm))	250		DATE	COMPLE	:TED: 13/0	2/2004
CO-ORDINATES : E -	BOREHOLE	DEPTH (I	m)		20.00		BORE	DBY: J	O'Hara	
N -	CASING DEF	7 (H (m)			20.00	SAM		'	1	ш
			NOL	Ē		<u> </u>	щ		IES1	PIPI S
DESCRIPTION		N H	.¥ ĝ	нтч	ц.	MBE	L H	H	Ins:	
		<u> </u>	<u> E</u>	<u> </u>	<u><u></u></u>	ž	∃ &	äs		6 2
Made Ground (consisting of clay fill										
			ļ						1	
			}							
			{	1.5	0					
Grey brown fine to coarse slightly sandy GR	AVEL									[
						231	R	200		
					44		U		1	1
3					4	232	в	3.00		
].	•	
						je	, •			
						net				
						Vote	-	1		
4					011 1 25	233	в	4.00		
				0500	2 N					
Brown slightly sandy gravelly CLAY with so	me	===	OUT	CUL	υ F U			1		
cobbles		EEE	ion yr							
		= = 3	OWIL			234	в	5.00		
		in the second	K.				-		1	
		1								
		SEEE								
Grou brown fine to coaree elightly condu G	BAVEL SON			5.	80	1		_		
with occasional cobbles and boulders	COR					1235	В	6.00		
						4236	в	7.00	ı	ļ
			1							
			4						ł	
]		l					
				1			_			
- 8						4237	в	8.00)	
								1		
			-			4238	в	9.00	0	
					ļ		ļ			ļ
10 Continued next sheet	•	ŀ	늬			4239	В	10.0	00	
Hard Strata Boring / Chisell	ing		· ·		,eL	Wate	r Strike [Details		
From (m) To (m) Hours	Comments		Wat	er	Casing	Sealed	Rise	Time	Comme	ents
0.00 1.50 1.00 1.50 2.50 1.25	_		13.3	ŏ -	13.20			- V	ery Slow	
		ł								
10.80 11.20 0.75 12.40 12.90 1.50						Groups	water O	hean/atio	ins	
			Da	te	Hole	Casing	Depth t	9	Comment	s
Standpipe Installation Deta	ils ase Tvoe		13/02/2	2004	20.00		<u>vvater</u> 16.00	Boreho	ble end	
	1100		10,02/2		-0.00	1				

1

4:07

EPA Export 25-07-2013:17:

R	EPORT NO: 9486	EOTECH	NICA	L BC	RIN	G REC	ORD	- 10	GSL L	td.
C	ONTRACT: Blessington Quarry						BORE Sheet	HOLE NO 2 of 2	BHL3	
Cl	LIENT : Roadstone Dublin Ltd.	GROUND LE	VEL (m	OD)	-		DATE	STARTED	: 10/0	2/2004
E	NGINEER : John Barnett & Associates		DIAMEI	EH (mm	1) 2: 21	50 5.00	DATE	COMPLE	FED: 13/0	2/2004
C	O-ORDINATES : E - N -	CASING DEP	7TH (m)	(in)	20	0.00 0.00	BORE	DBY: J	O'Hara	
ŝ		<u> </u>		Z	\$		AMPLES			Ш
튁	DESCRIPTION		B	NTA (U	ц Н	BER		E	D TEC	ALS N
Ë			EG		DEP	NUM	SAM	É DE	FIEL	STA
	Grey brown fine to coarse slightly sandy GR	AVEL								
	with occasional cobbles and boulders									
-10						4240	В	11.00		
	•									
-12						4241	В	12.00		
-13	•					4242	в	13.00		
-					13.30					
	Grey brown fine to medium SAND					N	<u>ي</u> .			
						atter				ł
- 14					Ň	×4243	в	14.00		
					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	pr u				
				. IP	Jille C					
				OR PLY	02					
-15			, de	tic where		4244	в	15.00		
			3.8					10.00		
		Ŷ	e con							
		. 8	0							
		nsent				4045		10.00		
		Cor				4240	Б	10.00		
	,									
[ ]	Grey fine to medium sandy GRAVEL				16.5					
	•						_			
Π						4246	В	17.00		
	·				17.4	o				
	Grey brown fine to medium SAND and occa	asional								
									,	
- 1B						4247	В	18.00		
									ļ	
[										
										1
F1þ						4248	в	19.00		
							1			
								l		
-20	End of Borobolo at 20.00			2	20.0	4249	В	20.00		
┢┷	Hard Strata Boring / Chisellin	g				Wat	er Strike D	Details		
	From (m) To (m) Hours C	omments	]	Wate	r Cas	sing Sealed	Rise	Time	Commer	nts
	0.00 1.50 1.00 1.50 2.50 1.25			13.30	13	20 -	-	- Ven	Slow	
	2.50 4.40 0.75 5.80 6.50 1.50									
	12.40 12.90 0.75					Groun	dwater Of	servations		
	Standpipe Installation Details		1	Date		ole Casing	Depth to	C	omments	
	Date Tip Depth RZ Top RZ Bas	e Type	7	13/02/20	04 20	.00 -	16.00	Borehole	end	
1										

·····

## Appendix II – Trial Pit Records

4

ļ.

Ļ,

þ

<b>KEPORT N</b>	O. 9486		IAL F	PIT F	REC	ORD			IG	SLI	.td
	Discrimina O					Trial Pit N	o.:	TPL	5		
	Blessington Quarry					Sheet:	<u> </u>	Shee	t 1 of 1		
CLIENT:	Roadstone Dublin I	.td.				Excavation	n Method:	JCB			
INGINEER:	John Barnett & Ass	ociates				Date Starte	ed:	13/0	2/2004		
CO-ORDINATES:	Ε-	······································				Date Com	pleted:	13/0	2/2004		
	<u>N -</u>					Ground Le	evel (mOD):			······	
								Samples		'	(ed
Depth (m)	Geotechnical De	scription	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	Hand Penetrometer (K
Made Gr glass, m Made Gr Made Gr sandy gr occasion	round consisting of t etal, plastic and bric round consisting of 1 avel with many cobt nal plastic, metal, gla	opsoil with roots, c oose grey brown very sles and boulders and ss and brick		0.40		, 15 ⁶ .		F	<b>П</b>		
1.0		foi sco	nere Svire	20 ⁵⁶⁵ co echite	tor and	otter	J2923	В	1.00		
2.0 Loose g cobbles	rey brown very sand and boulders and oc	y GRAVEL with many casional.		2.10			J2924	В	2.00		
-3.0 End of	Trial Pit at 3.00 m			3.00			J2925	В	3.00		
<u>[4.0]</u>	onditions: No g	roundwater encountered du	ring excava	tion	•		·				

CONTRACT: Blassington Quary Thial PEN by: TFLG Sec: Sheet 1 of 1 Becomment Method: ICB CUENT: Routeme Dablin Lid. ENGINEE: John Barnet & Associates CUENTE: N CUENTE:	REPORT NO.	9486	TRIAL P	IT R	REC	ORD			IG	SL L	.td
Silvet:     Steet I of I       CLIENT:     Readmon Dubla Lut.     Excavation Method:     ICB       ENORNEER:     John Bunsti & Associates     Data Statead:     1302/2004       DOUBLINKTES:     F     -     -       CO-OKDUNATES:     F     -     -       Georechnical Description     g     g     g     g     g       Georechnical Description     g     g     g     g     g     g       Made Ground consisting of topsoil     0.10     0.10     g     g     g     g       Made Ground consisting of topsoil     0.10     g     g     g     g     g     g       Made Ground consisting of topsoil     0.10     0.10     g     g     g     g     g       Made Ground consisting of topsoil     0.10     0.10     1292/5     B     1.00       Made Ground consisting of topsoil     0.10     0.10     1292/5     B     1.00       State of Trial PB at 4.00 m     0.00     0.10     1292/5     B     3.00       State of Trial PB at 4.00 m     0.00     0.00     0.00     0.00     0.00       State of Trial PB at 4.00 m     0.00     0.00     0.00     0.00       State of Trial PB at 4.00 m     0.00 <th< td=""><td>ייי א <b>מי</b>יזע ריי</td><td>leasington Over-</td><td></td><td>_</td><td></td><td>Trial Pit No</td><td>.:</td><td>TPL6</td><td></td><td></td><td></td></th<>	ייי א <b>מי</b> יזע ריי	leasington Over-		_		Trial Pit No	.:	TPL6			
CLENT:       Readence Dublin Lid.       Incovation Methods:       JOB         ENORDER:       Join Barreit & Associants       Join Stratest:       1302/2004         CO-ORDINATES:       N       Incovation Methods:       JOIN 2004         Ging display       Ging display       Ging display       Ging display       Ging display         Ging display       Ging display       Ging display       Ging display       Ging display       Ging display         Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging display       Ging	BI	essington Quarry				Sheet:		Sheet	1 of 1		
ENGINEER:         John Barnett & Associates         Date Starters:         1302/2004           CUUDDIDIATTS:         B	CLIENT: RO	oadstone Dublin Ltd.				Excavation	Method:	JCB			
Date Complexed:         13/02/20/4           CO-ORDINATE:         E         13/02/20/4           Co-ORDINATE:         E         13/02/20/4           Geodechnical Description         Samples         Samples           Geodechnical Description         Geodechnical Description         Samples           Made Ground consisting of topsoil         One         Samples         Samples           Made Ground consisting of topsoil         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           Made Ground consisting of topsoil         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           Made Ground consisting of topsoil         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           Made Ground consisting of topsoil         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           1.00         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           1.01         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples         Geodechnical Samples           1.02         Geodechnical Samples <th< td=""><td>ENGINEER: Jo</td><td>hn Barnett &amp; Associates</td><td></td><td></td><td></td><td>Date Starte</td><td>d:</td><td>13/02,</td><td>/2004</td><td></td><td></td></th<>	ENGINEER: Jo	hn Barnett & Associates				Date Starte	d:	13/02,	/2004		
COUNTRAILS:     N -     Ground Level (mOD):       General Level (mOD):     General Level (mOD):       Made Ground consisting of Losse grey brown very sandy gravel with many cobibies and bouldes.     General Level (mOD):       many gravel with many cobibies and bouldes.     General Level (mOD):     J2926       Hold:     General Level (mOD):     J2927       General Level (mOD):     General Level (mOD):     J2928       General Level (mOD):     J2929     General Level (mOD):       Level of Trial P1 st 4.00 m     General Level (mOD):     J2929       Level of Trial P1 st 4.00 m     General Level (mOD):     J2929	E	•				Date Comp	leted:	13/02	/2004		
Centechnical Description General and occasional glass and brick Centechnical Description Centechnical Descriptio	NN	•				Ground Le	vel (mOD):			<u>NP</u>	
Georechnical Description           Georechnical Description         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n         n <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Samples</td><td></td><td></td><td>Ē</td></th<>								Samples			Ē
0.0     Made Ground consisting of topsoil     0.10     0.10       Made Ground consisting of loose grey brown very sandy gravel with many coblies and boulders, many tyres some metal and occasional glass and bride     0.10     12926     B     1.00       1.0	Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Ref. No.	Type	Depth (m)	Vane Test (KPa)	£/
3.0 J2928 B 3.00 J2928 B 3.00 Led of Trial Pit at 4.00 m Groundwater Conditions: No groundwater encountered during excavation	-1.0 Made Ground Made Ground sandy gravel many tyres subrick	d consisting of topsoil d consisting of loose grey brown ver with many cobbles and boulders, ome metal and occasional glass and	y	0.10	A. and	over use.	J2926 J2927	В	1.00		
-4.0     End of Trial Pit at 4.00 m       Groundwater Conditions:     No groundwater encountered during excavation	-3.0						J2928	В	3.00		
Groundwater Conditions: No groundwater encountered during excavation	-4.0	al Pit at 4 (K) m		4.00			12929	В	4.00		
	Groundwater Condit	ions: No groundwater encounter	ed during excava	tion							
Stability: Trial pit unstble from 1.5m	Stability:	Trial pit unstble from 1.5m	n								

# Appendix III – Laboratory Test Records

1^{50.}

÷

















Determination of Moisture Content BS1377:Part 2:1990, clauses 3.2											
BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Description						
BH L3	4235	6.00	D	5.2	Brown slifghtly silty/clayey sandy GR	AVEL with some cobbles					
		<u> </u>	_		·						
						······					
					, 1) ⁵⁰ .						
		· · · · · · · · · · · · · · · · · · ·		N	NY ORE						
	<u> </u>	1	· · · · ·	ose et fo							
				on Purpeque							
				ASPECTOWIC							
	=			For With							
				sut o'							
	·										
			++	<u></u>		·					
						· ·					
	·····					· · · · · · · · · · · · · · · · · · ·					
		Contract		BLESSINGTO	N QUARRY (JBA	Contract No. 9486					
	<b>CI</b>	Compiled By			Date	Page					
10.	JL		D CONNOLL	Y	27/2/04	of					

Irish Geotechnical Services Ltd Industrial Estate Newbridge Co. Kildare

PI.Chart.Summary Issue 1 09/01

Vorinin Deutering Pixer 1950-brackets Etck.     Vindy Arbour, Dublin 14, Ireland.     Tek +353 1286467 Bixer 533 12	Ind John I	Rarnett a	nd Aeer	nciatae I t	d		Trialpit No
Windy Arbour, Dublin 14, Iteland.       Sheet 1 of Determined in the source of the sourc			nu 733u Ass Pk	ч.		TP L'10	
Tel: 333 1 294697 Fax: 333 1 294676 www.cal.le     Co-ords: -     Date       Level: -     01/03/200     Scale       Level: -     01/03/200       attion: Blessington, Co. Wickdow.     Dimensions:     Dimensions:       Sampta a Star Tedrig     Depth     125       Joing     Tre     Depth     125       Joing     Tre     Depth     128       Joing     Tre     Depth     100       Sampta a Star Tedrig     Depth     Level: -       Joing     Tre     Depth     Level: -       Joing     Depth     Level: -     Depth       Joing     Level: -     Depth     Level: -       Joing     Level: -     Depth     Level: -       Joing     Level: -     Depth     Level: -       Joing	Windv Ar	bour, Dublin 1	4, Ireland.				Sheet 1 of
Level:       Contract       Difference         calor:       Elessington, Co. Wicklow.       Difference       Scale         calor:       Elessington, Co. Wicklow.       BAP Project No. 2901-04       Scale       Scale         Samples & In Stat Tetring In (no)       Diff. Project No. 2901-04       Stratum Discription       Scale       Scale         Samples & In Stat Tetring In (no)       Diff. In Account Investigation       MAEE GROUND, correling dawy sawly gravel with some sobble and tome       Diff. In Account Investigation       Diff. In Account Investigation         In (no)       Diff. In Account Investigation       In Account Investigation       MAEE GROUND, correling dawy sawly gravel with some sobble and tome         In (no)       In (no)       In Account Investigation       In (no)       In (no)       In (no)         In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)         In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)         In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)         In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (no)       In (	Tel: +353 1	2964667 Fax: +3	353 1 2964676	www.csa.ie	Co-ords: -		Date
Ject Name: Dorans Pit Ground Investigation Tation: Blessington, Co. Wicklow. Samara & B. Star Straing The Starting Teaching Te	· · ···		<u></u>		Level: -	<u></u>	01/03/2004
Lation: Blessington, Co. Wicklow.     Depth     Litter       Samples dia Bito Termed In (n)     Use and to the terme Origin Indiana Depth Indiana Depth     Depth     Stratum Description       MADE GROUND     Mode GROUND     Stratum Description     Indiana Depth       Indiana Depth     Indiana Depth     Indiana Depth       Indiana Depth     Indina Depth     Indiana Depth	oject Name: Doran	s Pit Ground I	nvestigation		Dimensions:	-	Scale
Simple 2 in Star Teeling     Dech     Userel     3.00m     Logged B       Samples 4 in Star Teeling     Dech     Logged I     Stratum Description       In (n)     Type Vikinestiel Results     On     Logged I       (n)     Type Vikinestiel Results     On     Stratum Description       (n)     Type Vikinestiel Results     Stratum Description       (n)     Type Vikinestiel Results     Stratum Description       (n)     Stratum Description     Stratum Description       (n)     Stratum Description     Stratum Description       (n)     <	cation: Blessingtor	L Co. Wicklow	······································		Depth		1.20
And a constrained and a constrained of the con	ent: Roadstone D	ublin Ltd	IBA Broise	t No. 2001 04	3.00m		
In (m)     Type     Velativities     (m)	Samples & In Situ Testi	ng Denth	Level		<u> </u>	· · · · · · · · · · · · · · · · · · ·	
A control of the second o	th (m) Type Waterstrik	e Results (m)	(m AOD) Legen		Stratum [	Description	
3       3.00       -3       Trisipit Complete at 3.00 m         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -4       -4       -4       -4         -5       Stability: Unstable sides       TP I	-1 -2	2.30		(MADE GRO	UND)	some cobble. Gravel and cob	bles are
-4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4     -4       -4	-3	3.00	-3	S (SANDS & C	Trialpit Co	mplete at 3.00 m	
Remarks: Excavated adjacent to TP L/5	-4		- - - - - -				
	Remarks: Excavated	adjacent to TP I			Stability: Unstable s	ides	
	•						TDI

.

.

.....

Conds - United - Date	JB4	John Barne Unit 7, Dundrum	ett an Business	d As s Pk.,	ssocia	ites Ltd			Trialpit No <b>TP L 11</b> Sheet 1 of
Project Name: Dorans Pit Ground Investigation Location: Blassington, Co. Wicklow. Cilent: Roadstone Dublin Ltd. Sample & In Star Testing Depth (n) Type   Valencing Reach (n) Type   Valencing (n) Type   Va		Tel: +353 1 2964667	Fax: +353	1 2964 3 1 2964	csa.ie	Co-ords: -		Date 01/03/200	
Lucation: Blessington, Co. Wicklow. Cilent: Readstone Dublin Ltd. JBA Project No. 2901-04  Stratum Description  Read to read t	Project	Name: Dorans Pit Gr	ound Inv	/estiga	ation	<u></u>	Dimensions:		Scale
Client: Roadstone Dublin Ltd. JBA Project No. 2801-04 20011 20011 DL	Locatio	n: Blessington, Co. W	icklow.				Depth		1:25
Starting         Depth         (Level)         Level         Stratum Description           Depth (m)         Type         Weerstrike Results         m of m (n)         Provide Stratum Description           Image: Stratum Description         Image: Stratum Description         Brown days SMD and GRAVEL with some coble. Gravel and cobbe are           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description           Image: Stratum Description         Image: Stratum Description         Image: Stratum Description	Client:	Roadstone Dublin Lte	d	JBA Pr	roject No.	2901-04	2.0011		DL
Parmarks: Excavated adjacent to TP L/6 Provide Careford Science and coble are adjacent to TP L/6 Provide Careford Science at 200 m Parmarks: Excavated adjacent to TP L/6 Provide Careford Science at 200 m Parmarks: Excavated adjacent to TP L/6 Parmarks:	Samp Depth (m)	ples & In Situ Testing Type Waterstrike Results	Depth (m) (n	Levei n AOD)	Legend		Stratum E	Description	
Remarks: Excavated adjacent to TP L/6 Stability: Unstable sides		-1	2.60	-1 -2 -3		or inspection put	Poses only: and other use	mpiete at 2.60 m	
Remarks: Excavated adjacent to TP L/6 Stability: Unstable sides				F					
t i i i i i i i i i i i i i i i i i i i	Rema	arks: Excavated adjacent	to TP L/6	<u> </u>			Stability: Unstable s	ides	

JEA	John Ba	arnett a	nd Assoc	ciates Lt	d.		TP L/12
E E al	Unit 7, Duno	drum Busin	ess Pk.,				Sheet 1 of
	<ul> <li>VVINOV Arbo</li> <li>Tel: +353 1 29</li> </ul>	ur, Dublin 1 64667 Fax: +:	4, Ireiand. 353 1 2964676 w	ww.csa.ie	Co-ords: -		Date
• • • • •	L				Level: -		01/03/200
Project Na	ame: Dorans I	Pit Ground	nvestigation	÷	Dimensions:	-	
Location:	Blessington (	Co. Wicklov			Depth		1:25
Client: R	Proceedington, Coadstone Dub	lin I td	IBA Project	No 2901-04	5.50m		
Samples	s & In Situ Testing	Depth	Level	10, 2001-0-	<u></u>		
Depth (m) T	Type Waterstrike R	lesults (m)		Brown slight	stratum		
	1	1.40	-2 -3 -3 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4	Brown fine s (SANDS & G	andy SILT/silty fine SANDS (RAVELS) of the second of the s	Ş	
				×			
				×.	Cont	inue <u>d nex</u> t sheet	_
Remarks	s:				Stability: Sides star	nd vertical	
	inter: Slight oper		denth		Shoring:		−− TP L/

JEA John Barnett and Associates Ltd. Unit 7, Dundrum Business Pk., Windy Arbour, Dublin 14, Ireland. Tel: +353 1 2964667 Fax: +353 1 2964676 www.csa.ie Level: -									Trialpit No <b>TP L/12</b> Sheet 2 of 2 Date 01/03/2004
Project N	lame; Dorans	s Pit Gro	und ir	nvestig	ation	_	Dimensions:		Scale
Location	: Blessington	, Co. Wie	cklow.			····	Depth		
Client: F	Roadstone Du	Jblin Ltd.	. ]	JBA P	roject	No. 2901-04	a.oum		DL
Sample	es & In Situ Testin	Ig Recutt	Depth		Legend		Stratum P	)escription	
			5.50	-		Brown fine sand (SANDS & GRA	y SILT/silty fine SAND VELS) Trialpit Com	plete at 5.50 m	
	- 6			-6			see only any other us	<i>ې</i> .	-6
	-7			- 7	Con	For inspection pr	Routie		-7
	-			° - - - - - - - - - - - - - - - - - - -					-8
Remark	ks:				<u></u>		Stability: Sides stand	d vertical	
Ground	water: Slight se	epage at	2.1m c	lepth			Shoring:		IP L/12

.

	- 44 -	۸ ام ما					Trialpit No	0
JBA Jonn Barn		na A	SSOC	lates Lto			TP L/13	3
Unit 7, Dundrum	Busine	ess Pk.,	, 				Sheet 1 of	f 1
Tel: +353 1 2964667	UDIIN 1 Fax: +3	4, Ireia 53 1 296	na. 34676 ww	wicsalie	Co-ords: -		Date	
	1 47. 10	00 1 200	4010 00	11.004.10	Level: -		01/03/200	)4
Project Name: Dorans Pit G	round l	ovestia	ation		Dimensions:	-	Scale	
							1:25	
Location: Blessington, Co. V	Location: Blessington, Co. Wicklow.				2.20m		Logged B	3y
Client: Roadstone Dublin Li	id.	JBA F	Project N	lo. 2901-04	L			
Depth (m) Type Waterstrike Results	(m)	(m AOD)	Legend		Stratum D	escription		
	2.20			Firm to stiff sand (TOPSOIL)	y CLAY with occasional of ndy GRAVEL with some VELS)	cobble. Gravel sub-rounded to	o rounded.	
					Stability: Sides unsta	anie		140
Groundwater: Trial pit dry					Shoring:			/13





				Site:	Lands	at Blessin
				Project:	Remed	diation of
1	Mar 04	SMD/PM		Title:	Propos	sed Landf
0	Dec 03	SMD/PM		Drawn: SN	ID/PM	Scale:
Rev.	Date	By	Description	Job. No: 2	901/09	Date: D

		1
D	Trail Pit	)
	TPL1 E 298021 N 215934	
1	TPL2 E 298042 N 216004	
	Ground level 229 TPL3 E 298038 N 215891	
4	Ground Level 236 TPL4 E 298080 N 215968	
	Ground Level 230	
	Ground Level 238	
	TPL6 E 298176 N 215923 Ground Level 238	
2	Ground Level 238	
1	TPL11 E 298173 N 215917 Ground Level 233	
1-	TPL12 E 298124 N 215868 Ground Level 236	
15	TPL13 E 298104 N 215919 Ground Level 237	
	TPL14 E 298124 N 215951 Ground Level 237	
A		
1	Borehole	
20	BHL1 E 297990 N 215879	
	BHL2 E 297977 N 216022	
	Ground level 239.5 BHL3 E 298137 N 215946	
3	Ground Level 237.9	
(((CaEs	Groundwater Well Locations	
7 502	GW 1/3 E 298147 N 215984 Ground Level 237.7	
-		
Je .		
)		
~ 111		
Da		
	Notes:	
Z	Locations of Trial Pits TP10 - TP14	
	Excavated and Logged by	
	Excavated and Logged by	
	John Barnett & Associates.	
naton (	Co Wicklow	
I Inauth	orised Landfill Sites	
fill Site	Ground Investigation Locations	
un one-	Stouling in Courge Locations	

APP. 5D

1:2000 _____ Dec 2003