14	A									REPORT NU	JMBER	
02	933L	Т	RIAL PIT I	RECO	RD			16695				
CON	TRACT	Greater Dublin Drainage Scheme					it no.					
	GED BY	JL	CO-ORDINAT	ES			TARTE	Sheet 1 of 1 RTED 24/01/2013				
			GROUND LEVEL (m) DATE COMPLE								/2013 ta KX08	0.25
CLIE ENGI	INEER	Fingal County Council								Kubo	0-3a	
									Sample	s	Pa)	ometer
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0		IL: Soft grey brown silty CLAY		$\frac{\underline{x}^{1}}{\underline{y}} \cdot \underline{x}^{1} \cdot \underline{y}$	0.30							
	Soft to fi Sand is	irm brown to yellow brown slightly san fine to medium.	dy silty CLAY.		0.50							
-	slightly s	irm grey brown occasionally mottled ye sandy slightly gravelly silty CLAY. San . Gravel is subangular to subrounded topo	d is fine to	× + ; × + ; × + ;	0.90			AN4642	В	0.60-0.80		
1.0 	Firm gre content. subroun	ey brown sandy gravelly CLAY with a lo Sand is fine to medium. Gravel is and ided fine to coarse of limestone. Cobbi alar to subrounded of limestone.	gular to		0.30			AN4643	В	1.00-1.10		
- - - - - - - -	medium subangu	k grey brown slightly sandy gravelly Cl cobble content. Sand is fine to mediu lar to subrounded fine to coarse of lin are subrounded of limestone.	m. Gravel is	1, 0, 0, 131, 131, 131, 131, 131, 131, 1	1.60			AN4644	В	1.90-2.00		
	medium fine to c	f dark grey brown gravelly CLAY with cobble content. Gravel is subangular oarse of limestone. Cobbles are subar ded of limestone.	to subrounded	101 01 01 01 01 02 02 02	2.30			AN4645	В	2.50-2.60		
3.0												
- - - - - - - - - - - - - - - - - - -	End of 1	Γrial Pit at 3.20m			3.20							
Grou Dry Stab Good Pit te	ility	Conditions										
Gene Pit te	eral Rema	arks on very stiff clay										

2	5	-		REPORT NUMBER									
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP0	5		
								SHEET		Sheet 1 of 1			
LOG	GED BY	JL	CO-ORDINAT	CO-ORDINATES DATE STARTED DATE COMPLE									
CLIE ENGI	NT NEER	Fingal County Council	GROUND LE	GROUND LEVEL (m) EXCAVATION METHOD							Kubota KX080-3a		
			·						Sample	6	a)	meter	
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
0.0	TOPSO fine.	IL: Soft brown slightly sandy silty CL4	Y. Sand is	<u>17</u> · <u>117</u> · <u>117</u>									
-	Soft to f medium	irm yellow brown sandy silty CLAY. S	Sand is fine to		0.30			AN4626	В	0.50-0.60			
 1.0	sandy g	irm grey brown occasionally mottled or ravelly CLAY. Sand is fine to medium ular to subrounded fine to coarse of lin	. Gravel is		0.90			AN4627	В	1.20-1.30			
 - -	slightly s cobble o subang	stiff grey brown occasionally mottled sandy gravelly silty CLAY with a low to content. Sand is fine to medium. Grav ular to subrounded fine to coarse of lin	o medium ⁄el is		1.40			AN4628	В	1.50-1.70			
2.0	Cobbles	s are subrounded of limestone.			2.40		(Seepage)						
-	with a lo content. subrour subangi subrour	rery stiff grey brown slightly sandy gra w to medium cobble content and a lo Sand is fine to medium. Gravel is su ided fine to coarse of limestone. Cobb ular to subrounded of limestone. Boul ided of limestone (up to 300mm).	w boulder bangular to bles are		3.00			AN4629	В	2.60-2.70			
_ 3.0 - - -	End of ⁻	Γrial Pit at 3.00m											
4.0													
-													
-													
		Conditions page at 2.15m											
Stab Good													
	eral Rema rminated	arks on stiff to very stiff clay											

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REPORT NUMBER

2	5	т	RIAL PIT I	AL PIT RECORD								
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP0		
LOG	GED BY	JL	CO-ORDINAT					DATE S				
CLIE ENG	NT INEER	Fingal County Council	GROUND LE	/EL (m)				EXCAVA METHO		Kubota KX080-3a		
									Sample	s	a)	neter
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 - -		DIL: Soft grey brown to brown silty CLA			0.40							
- - -	gravelly to coars	firm yellow brown mottled light grey brown subangular to su se of limestone.	Ibrounded fine		0.80			AN4634	В	0.50-0.60		
- - - - - - -	Gravel	ey brown mottled light grey slightly san with a low cobble content. Sand is fine t is subangular to subrounded fine to co ne. Cobbles are subangular to subroun ne.	arse of					AN4635	В	0.90-1.10		
- 2.0 - - -	fine to r	ey brown slightly sandy gravelly CLAY on n cobble content and a low boulder con medium. Gravel is subangular to subro of limestone. Cobbles and boulders are nded occasionally tabular of limestone.	tent. Sand is unded fine to e subangular to	<u>א אלו לא אי ואו או או</u> ו -	1.80			AN4636	В	1.90-2.00		
- - - - 3.0	Gravel limesto limesto	iff to hard grey brown slightly sandy gra nedium cobble content. Sand is fine to is subangular to subrounded fine to coa ne. Cobbles are subangular to subroun ne. Trial Pit at 2.90m	arse of		2.60 2.90			AN4637	В	2.70-2.90		
-	End of	mai Pit at 2.90m										
- 4.0 -												
- - - -												
Grou Dry	undwater	Conditions					1					

16695.GPJ IGSL.GDT 5/4/13

Stability Good

General Remarks Pit terminated on very stiff clay IGSL TP LOG

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10		7
10	93	a,/

REPORT NUMBER

2		TRIAL PIT	RECO	RD					160	695		
CON	NTRACT Greater Dublin Drainage Sch	eme					TRIAL P	IT NO.	TP07 Sheet 1 of 1			
LOG	GGED BY JL	CO-ORDINAT					DATE S		D 24/01/2013			
CLIE ENG	ENT Fingal County Council	GROUND LE	VEL (m)			EXCAVA METHO		Kubota KX080-3a				
								Sample	s	a)	meter	
	Geotechnical Descrip	tion	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
0.0 - -	TOPSOIL: Soft brown silty CLAY			0.40								
-	Soft to firm yellow brown to brown sligh Sand is fine to medium. Soft to firm brown slightly sandy slightly Sand is fine to medium. Gravel is subar fine to medium of limestone.	gravelly silty CLAY.		0.60			AN4630	В	0.70-0.80			
- 1.0 	Firm brown mottled orange brown sand CLAY with a medium cobble content. S medium. Gravel is subangular to subrou of limestone. Cobbles are subrounded of	and is fine to unded fine to coarse		1.00			AN4631	В	1.10-1.20			
- - - 2.0	Soft to firm brown occasionally mottled gravelly CLAY with a medium cobble co medium. Gravel is subangular to subrou of limestone. Cobbles are subangular to	ontent. Sand is fine to unded fine to coarse	\. \. \. \. \. \. \. \. \. \. \. \. \. \	1.60		(Seepage)	AN4632	В	1.70-1.90			
- - - -	limestone. Very stiff dark grey brown slightly sandy a low to medium cobble content. Sand i subangular to subrounded fine to coars Cobbles are subrounded of limestone.	s fine. Gravel is	· · · · · · · · · · · · · · · · · · ·	2.10			AN4633	В	2.30-2.40			
3.0	End of Trial Pit at 3.00m			3.00								
- - -												
- 4.0 -												
- - - -												
	undwater Conditions st at 1.10m. Seepage at 1.80m		<u> </u>	<u> </u>	L	<u> </u>					<u> </u>	

16695.GPJ IGSL.GDT 5/4/13 Stability Poor stability

IGSL TP LOG

General Remarks Pit terminated on stiff clay coupled with poor stability from ground level to 2.10m

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TRIAL PIT RECORD

0	33],									100	995		
CON	ITRACT	Greater Dublin Drainage Scheme	9					TRIAL PI	T NO.	TP0	3 : 1 of 1		
	GED BY	JL	CO-ORDINAT	TES				DATE ST	ARTED				
		JL		\/ F L (m)				DATE CO	OMPLE	TED 24/01	ED 24/01/2013		
CLIE		Fingal County Council	GROUND LE	VEL (M)				EXCAVA METHOD	ota KX080-3a				
ENG								1					
									Sample	6		eter	
							Ð				Vane Test (KPa)	trom	
		Geotechnical Description				uo	Water Strike	a)			est	Hand Penetrometer (KPa)	
				Legend	Depth (m)	Elevation	ater	Sample Ref	Type	Depth	ane 1		
					۵£	ū	Š	ů s s s s s s s s s s s s s s s s s s s	ŕ	ă	>	Ĩ	
0.0	TOPSO fine to	DIL: Soft to firm brown slightly sandy medium.	CLAY. Sand is	1/. 1/ 1/ 1/									
				<u>\ 17</u> · <u>\ 17</u>	0.40								
	Soft to	firm brown to yellow brown slightly s s fine to medium.	andy silty CLAY.		0.40								
		firm grey brown slightly sandy slight with rare rootlets. Sand is fine. Grave	y gravelly silty	/ X0 X				AN4622	В	0.60-0.80			
	\to subr	ounded fine to medium of limestone.	. ,		0.80								
1.0	Firm gr	rey mottled brown and orange brown y CLAY. Sand is fine to medium.	slightly sandy					AN4623	В	1.00-1.10			
				- <u>·</u> ··									
		- Occasional subrounded boulder of	limestone (up to	· <u>·</u> ·····									
	250mm	n)											
2.0	Very st	iff grey to grey brown gravelly CLAY content. Gravel is subrounded fine to	with a medium	0	2.00								
	cobble limesto	content. Gravel is subrounded fine to ne. Cobbles are subrounded of limes		-			AN4624	В	2.10-2.20				
3.0													
	End of	Trial Pit at 3.20m		<u> </u>	3.20			AN4625	В	3.10-3.20			
4.0													
Gro Dry	undwate	r Conditions											
,													
Stat Goo	bility d												
Gen	eral Rem	narks											
		l on very stiff clay											

1												REPORT NUMBER			
A.	831	т	RIAL PIT F	RECO	RD					16695					
со	NTRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP0					
LO	GGED BY	JL	CO-ORDINAT	ES				DATE S							
	ENT	Fingal County Council	GROUND LEV	/EL (m)			EXCAVATION Kubota KX0			ta KX08	0-3a				
ENG	GINEER								Campila			er			
									Sample		(Pa)	omet			
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)			
0.0	TOPSO	L: Soft brown slightly sandy silty CLA	Y. Sand is fine	<u>x 1_n. x 1_n.</u>	0.10										
-	Soft grey Soft bec sandy sl is suban Firm gre	y organic CLAY with occasional rootlet oming firm yellow brown mottled brow ightly gravelly CLAY. Sand is fine to m gular to subrounded fine to medium o y brown mottled light grey and orange		0.30 0.60			AN4638	В	0.40-0.60						
- - 1.0 - -	sandy gr Sand is fine to co	avelly CLAY with a low to medium cot fine to medium. Gravel is subangular t parse of limestone. Cobbles are subar ded of limestone.	oble content. o subrounded	, b. (d) ' d/ p 6 d ' d' d/			1	AN4639	В	1.00-1.10					
- - - - 2.0 -	CLAY w	stiff grey brown mottled yellow brown v ith a medium cobble content. Gravel is ded fine to coarse of limestone. Cobbl lar to subrounded of limestone.	s angular to	0 0 0 0 0	1.75		(Seepage)	AN4640	В	1.80-2.00					
- - - - 3.0	cobble c coarse c	ery stiff dark grey black gravelly CLAY ontent. Gravel is subangular to subrou f limestone. Cobbles are subrounded	unded fine to		2.50										
-	End of T	rial Pit at 3.30m			3.30			AN4641	В	3.20-3.30					
- - - - - - -															
-															
-	oundwater epage at 1.5														
	paye at 1.0	0.11 0.11													
God	bility od														
	neral Rema terminated o														



1	0	6																
<u> </u>	NTRA		eater Dub	olin Dr	rainage S	Scheme	B 16 T						!	BOREH SHEET		E NO.	BH05 Sheet 1 of 2	
		NATES LEVEL (r	n AOD)					e Dle Diam Dle Dept			n) 2	Dando 20 200 3.20	·	DATE COMMENCED 13/02/2013 DATE COMPLETED 13/02/2013				
	ENT GINEEI		gal Cour	nty Co	uncil			MER RE RATIO (9).		SPT6 5		BORED BY WC PROCESSED BY JL				
														ples				
Depth (m)			Ľ	Descri	ption			Legend		Elevation	Depth (m)	Ref. Number	Sample Type	Depth	(111)	Recovery	Field Test Results	Standpipe Details
- 0	Soft I	becoming	firm light	brow	n sandy (gravelly CL	_AY		2 			AN3715	в	1.00-1.			N = 5 (2, 1, 1, 2, 1, 1)	
2									- - - - - -			AN3716	В	2.00-2.	45		N = 3 (0, 1, 1, 0, 1, 1)	
- 3	Medium dense grey brown sandy subangular to subrounded fine to coarse GRAVEL								>		2.90	AN3717	В	3.00-3.	45		N = 14 (1, 2, 2, 3, 4, 5)	
- 4	Stiff dark brown sandy gravelly CLAY							0.0.00			4.00	AN3718	В	4.00-4.	45		N = 49 (3, 6, 8, 11, 14, 16)	
5									- - - - - - - - - - - - - - - - - - -			AN3719	В	5.00-5.	45		N = 25 (4, 6, 6, 5, 7, 7)	
- 7									- - - - - -			AN3720	В	6.50-6.	95		N = 30 (6, 6, 7, 7, 8, 8)	
8									- - - - - - - - - - - - - - - - - - -		8.60	AN3721	В	8.00-8.	45		N = 23 (5, 6, 7, 7, 5, 4)	
- 9	Gravel is subangular to subrounded fine to coarse of limestone. Stiff dark brown sandy gravelly CLAY with a medium cobble content										9.20	AN3722	В	9.50-9.	95		N = 35 (6, 7, 8, 8, 9, 10)	
E.											10.90	-						
						Wate	er	Casir	ng S	Sealed	Rise	Э Г	Time	<u> </u>	TER STRIKE DET	AILS		
	m (m)	To (m)	Time (h)	Con	nments			Strik	e	Dept	'n	At	To		(min)		omments	
10 11	3.8 8.9 0.75 0.6 10.8 0.75 1.7 11.9 0.5 2.9 13.2 1.25		2.90		2.90 8.60		4.00	1.60 7.10		20 20		Slow Moderate						
										Ц	ole	Casing	Der	oth to			UNDWATER PRO	GRESS
	TALL/ Date	Tip Dep	TAILS	op F	RZ Base	Тур	De	Dat	te	_	epth	Depth	W	oth to ater	Cor	nment	İS	
RE	MARK	S					Sampl	ple Legend all Disturbed (tub) U - Undisturbed 100mm Diame				sturbed 100mm Diameter Samp	ble					
							D - Small Disturbed (tub) U - Undisturbed 100mm Diam B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)					er Sample						



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CON	TRAC	T Great	er Dublin	Drainage S	cheme							BOREH SHEET	OLE NO	O. BH05 Sheet 2 of 2	,
	ordin Und L	ATES .EVEL (m /	AOD)		B		e Dle Diame Dle Depti		nm) 2	Dando 20 200 3.20	00	-		ENCED 13/02/2013	
CLIEI ENGI	NT NEER	Finga	I County (Council			MMER REF RATIO (%			SPT6 5		BORED PROCES		WC BY JL	
-											San	nples			D.
Depth (m)			Desc	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recoverv	Field Test Results	Standpipe Details
11	Stiff to with a	very stiff lin medium co	ght brown bble and l	sandy grav boulder con	velly silty CL htent <i>(contine</i>	AY ued)		· · · · · ·	13.20	AN3723 AN3724	В	11.00-11.		N = 34 (4, 6, 7, 7, 8, 12) N = 50/225 mm (8, 11, 12, 10, 19, 9	
- 14	End of	Borehole	at 13.20 m	1					13.20	-					
15															
16															
17															
18															
20															
21															
HAR	D ST			ELLING						I	l	L		WATER STRIKE DE	TAILS
From	(m) -	Го (m)	Time (h) C	omments			Wate Strike		ising S epth	Sealed At	Ris To		ime nin)	Comments	
8.8 10.0 11. 12.9	6 7	10.8 11.9	0.75 0.75 0.5 1.25												
									Hole	Casing	De	pth to		ROUNDWATER PR	OGRESS
	ALLA [.] ate	TION DET		RZ Base	Туре	!	Date	e	Depth	Depth	N N N N N N N N N N N N N N N N N N N	ater	Comm	ents	
REM	ARKS								D - Small [B - Bulk Di LB - Large	e Legence Disturbed (tub) sturbed Bulk Disturbed ronmental Sam	1		P -	Undisturbed 100mm Diameter Sa Undisturbed Piston Sample • Water Sample	mple



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		0	- (D										BOREH			DUOC	
co	NTRAC	T Gre	ater Du	blin Dr	rainage S	scheme							SHEET		E NO.	BH06 Sheet 1 of 2	
	-ordin Ound	IATES LEVEL (r	n AOD)					e Dle Diam Dle Dept		mm)	Dando 2 200 13.70	000	DATE (DATE (ED14/02/2013ED15/02/2013	
	ENT		gal Cour	nty Co	ouncil		-	MMER REI			SPT6		BORED			WC	
ENG	GINEEF	2					ENERG	(RATIO (%	6)		55		PROCE	SSE	ED BY	JL	
Ê									Ę	E E	<u> </u>				≥		be
Depth (m)			[Descri	ption			Legend	Eleviation	Depth (m)	Ref. Number	Sample Type	Depth	(111)	Recovery	Field Test Results	Standpipe Details
= 0	Soft to	o firm ligh	t brown	sandy	gravelly	CLAY		<u> </u>									
- 1								 			AN3725	БВ	1.00-1.4	45		N = 9 (1, 2, 2, 2, 2, 3)	
Ē								<u> </u>			_					(1, 2, 2, 2, 2, 3)	
Ē	Firm t	o stiff dar	k brown	mottle	ed orange	e brown sa	andy			1.7)						
2	grave	Ily CLAY	with a m	edium	cobble o	content		0			AN3726	бВ	2.00-2.4	45		N = 11 (2, 3, 3, 2, 3, 3)	
Ē																	
- 3											AN3727	, в	3.00-3.4	45		N = 15	
- 3											AN3727	В	3.00-3.4	45		(2, 3, 3, 4, 4, 4)	
Ē																	
4											AN3728	в	4.00-4.4	45		N = 24	
Ē								0								(4, 5, 6, 6, 7, 5)	
Ē																	
5											AN3729	в	5.00-5.4	45		N = 24 (6, 6, 5, 5, 7, 7)	
Ē																	
Ē	Dense	e BOULD	ERS wit	h som	e dark br	own claye	y sand			5.8)						
6																	
Ē											AN3730	В	6.50-6.9	95		N = 30 (4, 5, 7, 7, 8, 8)	
E 7								137									
Ē								h									
Ē								10C									
- 8								i <u>a</u> Ot		8.2	AN3731	В	8.00-8.4	45		N = 50/190 mm (11, 14, 16, 19, 15)	
						CLAY with ulder conte											
- 9								$\overline{\mathbf{Q}}$									
- 9	Mar	مناط ما - سار ا		ua alc						9.3)						
Ē		stiff dark k im boulde			ravelly C	LAY with a	4	MOOT			AN3732	2 В	9.50-9.9	95		N = 50/225 mm (9, 11, 14, 16, 18, 2)	
- 10																	
Ē																	
Ē																	
HA		RATA BO	ORING/C	HISE	LLING			₩ <u></u>					I			TER STRIKE DET	AILS
Fror	m (m)	To (m)	Time (h)	Con	nments			Wate Strike	-	asing Depth	Sealed At	Ris To		Time (min)	10.0	omments	
2 2	2.7 6	2.9 6.2	0.5 1					5.80		5.80	6.50	5.8		20		Seepage	-
<u>7</u>	.8	7.9	0.5														
5 1 :	10 3.5	10.25 13.7	0.75 1														00500
	TAI 1 4		тане					Dat		Hole	Casing		pth to	Cor	GRO mment		GRESS
<u>اب</u>	Date		th RZ	Top F	RZ Base	Ту	pe	Dal		Depth	Depth		/ater				
REI	MARKS	5								San	nple Leger	ıd		I	11 114-2	nturbod 100mm Diamates 0	
										B - Bu LB - L	nall Disturbed (tub lk Disturbed arge Bulk Disturb	ed			P - Undis	sturbed 100mm Diameter Samp sturbed Piston Sample er Sample	JC
2										Env - I	Environmental Sa	mple (Jar +	Vial + Tub)				



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1	-	5													
со	NTRAC	T Grea	ater Dublin	Drainage S	Scheme							BOREHO SHEET	DLE NC	D. BH06 Sheet 2 of 2	
	-ordin Ound	IATES LEVEL (m	AOD)		BC		E DLE DIAMI DLE DEPT		mm)	Dando 20 200 13.70	000			NCED 14/02/2013	
			al County (Council						SPT6		BORED		WC	
	GINEER				EN	IERGY	RATIO (%	′o)		55		PROCES	SED B	BY JL	
Depth (m)			Des	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	-	Recovery	Field Test Results	Standpipe Details
11 12 12 13 14 15 16 16 17 17 19 19 20 21	mediu	m boulder	e at 13.70 m	ontinued)	LAY with a				13.7	AN3733 AN3734	В	11.00-11.4		N = 49 (6, 8, 11, 12, 12, 14) N = 50/225 mm (10, 11, 13, 16, 18, 3)	
- H/	ARD ST	RATA BO	RING/CHIS	ELLING									v		AILS
Fror	m (m)	To (m)	Time (h) C	omments			Wate Strike		asing epth	Sealed At	Ris To		me nin)	Comments	
	2.7 6 7.8 10 3.5	2.9 6.2 7.9 10.25 13.7	0.5 1 0.5 0.75 1									× (II		ROUNDWATER PRO	GRESS
	TALLA	TION DE	TAILS				Dat	e	Hole	Casing	De	pth to ater	Comme		-
	Date		th RZ Top	RZ Base	Туре				Depth	Depth					
RE	MARKS	3							B - Bull LB - La	nple Legen all Disturbed (tub) k Disturbed arge Bulk Disturbe nvironmental San	d	Vial + Tub)	P - U	Jndisturbed 100mm Diameter Samp Indisturbed Piston Sample Water Sample	le



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

1937												
CONTRACT Greater	^r Dublin Drainage So	cheme					DRILLH SHEET		0	RC Shee	05 et 1 of 3	3
CO-ORDINATES			RIG TYPE			Casadrande	DATE D)	12/0	3/2013	
GROUND LEVEL (mOD			FLUSH	<i></i> 、		AII/IVIISt)		3/2013	
CLIENT Fingal C ENGINEER	County Council		INCLINATION CORE DIAMET			-90 80	DRILLE			JL	. Newla	ind
Downhole Depth (m) Core Run Depth (m) T.C.R.% S.C.R.% R.Q.D.%	Fracture Spacing Log (mm) 250 500	Non-intact Zone Legend			Descriptio	'n			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
- 0 - 1 - 2 			Cased down S SYMMETRIX returns of She	DRILLING	S: No recov	ery, observe	ed by driller	as 3	.50		X () X ()	
REMARKS				Nator	Casing	Soaled	Pisc		NAT	ER S	RIKE	DETAILS
Hole cased 0.00-24.0m			S	Strike	Casing S Depth	Sealed At		Time min)	Cor	mment	S	
			2	22.00								
					Hole	Casing	Donth to				VATER	DETAILS
INSTALLATION DETAIL				Date	Hole Depth	Casing Depth	Depth to Water	Comm	ents			
REMARKS Hole cased 0.00-24.0m INSTALLATION DETAIL Date Tip Depth 13-03-13 24.00	RZ Top RZ Base 22.50 24.00	Тур 50mm										



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

0	33	a./					-									1	665	15
COI	NTR	АСТ	Ģ	Greate	er Dublin [Drainage	Sche	eme					DRII SHE	LHOLE	NO	RC Shee	05 et 2 of	3
				(mO	וח				RIG TYPE			Casagran	DAT de C6 _{DAT}	e drilli E loggi	ED ED		3/201 3/201	
CLI					County C	Council			FLUSH INCLINATI CORE DIA		m)	Air/Mist -90 80	DRI	LED BY	,	M JL	. New	land
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lc (mi	cing og m)	Non-intact Zone	Legend			Descrip	iion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10 11 12 13 14 15 16 17 18									SYMMETF returns of I	Shell & Aug	NG: No reco ger Fill <i>(con</i> VG: No reco y with grave	overy, obse I bands.	rved by dri	ler as	<u>13.20</u>			N = 50/80 mm (5, 20, 32, ' N = 50/80 N = 50/80
19																		mm (18, 7, 44, N = 50/13 mm (7, 18, 32,
	IAR		0.0			1				Water	Casing	Sealed	Rise	Time	WA	TER S	TRIKE	DETAILS
	5 685	seu U	.00-2	24.0m	I					Strike 22.00	Depth	At	To	(min)		mmen		
INS	TAL			DETA	ILS					Date	Hole	Casing	Depth t Water	⁰ Com	GRO		MAIE	R DETAILS
	Date 03-1	-		epth	RZ Top 22.50	RZ Base 24.00	9	Typ 50mm		12-03-13	Depth 18.00	Depth 18.00	7.00	- 1		ecorded	at start	of shift



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

()	93	a./					_0.									1	669	5
CON	ITR/	ACT	G	Freate	er Dublin E	Drainage	Sche	me						LLHOLE	NO	RC		2
co-	ORD	DINA	TES										SHE DAT		ED		et 3 of 3 3/2013	
GRO	DUN	D LE	VEL	(mO	D)				RIG TYPE FLUSH			Casagrar Air/Mist	nde C6DAT	E LOGGE	ED		3/2013	
	ENT		F	ingal	County C	ouncil			INCLINATI		m)	-90 80		LLED BY		M JL	. Newla	and
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lc (mi 0 ²⁵⁰	cing yg m)	Non-intact Zone	Legend			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20 21 22 23 24 25 26 27 28 29	25.00	0	0	0					Attempted boulder wi	RIX DRILLII boulder clay	erved by dr y	iller as pos		tone	24.00			N = 50/3 mm (7, 25, 50 N = 50/0 n (9, 16, 50 N = 50/0 n (25, 50)
	IAR cas		.00-2	4.0m	 					Water Strike 22.00	Casing Depth	Sealed At	Rise To	Time (min)		TER S		DETAILS
																יסואוור	~~~~	
	TALI	LATI		DETA	ILS					Date	Hole	Casing	Depth t Water	0 Com	ments			
NS										Duic	Depth	Depth	VVater			-		
	Date	-	Tip D	epth	RZ Top	RZ Base	e	Тур	be	12-03-13	25.00	24.00	16.50		level re	ecorded	at end of	borehole



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

160	93	1/														I	669	15
CON	ITR/	АСТ	G	Freate	er Dublin E	Drainage	Sche	me						LHOLE	NO	RC		
CO-(ORD	INA	TES										SHE		-0		et 1 of 3/2013	
GRC			VFI	(mO	וח				RIG TYPE			Casagran		E LOGGE	ED		3/2013 3/2013	
CLIE	ENT				County C	Council			FLUSH INCLINATION CORE DIAL		m)	Air/Mist -90 82	DRIL	LED BY	,	M JL	. Newl	and
(E	(n										-							
 Downhole Depth (m) 	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lo (mr 0 250	cing og m)	Non-intact Zone	Legend			Descrip				Depth (m)	Elevation	Standpipe Details	SPT (N Value)
1 2 3 4 5 6 7 8 9									returns of I	boulder cla	NG: No reco							
		KE													14/4-			
	ARI cas		.00-1	8.00r	n					Water	Casing	Sealed	Rise	Time		mment		DETAILS
										Strike	Depth	At	To	<u>(min)</u>				e recordeo
															GRO		VATE	R DETAII
NST				DETA						Date	Hole Depth	Casing Depth	Depth to Water	D Com	ments	6		
	Date		Tin D	a m t la	RZ Top	DZDee	_	Typ		14-03-13			2.50		Invela	ecorded		



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

0332						I	669	5
CONTRACT Greater Dublin Drainage Scheme				LHOLE I	NO	RC		
CO-ORDINATES					D		et 2 of 3 3/2013	
GROUND LEVEL (mOD)	RIG TYPE 	Casagra Air/Mist		LOGGE	D		3/2013	
CLIENT Fingal County Council ENGINEER	INCLINATION (deg)	-90		LED BY GED BY		M JL	. Newla	nd
Core Run Depth (m) Core Run Dept	,	Description			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	SYMMETRIX DRILLIN returns of boulder clay	(continued) IG: No recovery, obs with bands of grave edded grey fine grai asional medium to w k very thin black MU e 2.15m 0-10° very clo tight to partly open, ed fractures in muds 90° smooth planar	erved by drill ned agrillace dely spaced DSTONE. sely to mediu clean. Occas	er as	15.00			N = 50/15 mm (11, 14, 50 N = 50/3 mm (9, 16, 50) N = 50/0 m (25, 50)
100 64 0	18.60-18.86m Fracture Water	Casing Sealed	Rise	Time		TER SI		DETAILS
	Strike	Depth At	То	(min)	N	o wate	r strike	recorded
		Hole Casin					VATER	DETAILS
	ype 14-03-13 m SP 15-03-13	Depth Depth 15.00 15.00 15.00 15.00		Water drilling	level re	ecorded	10mins a at start o	fter end of



GEOTECHNICAL CORE LOG RECORD

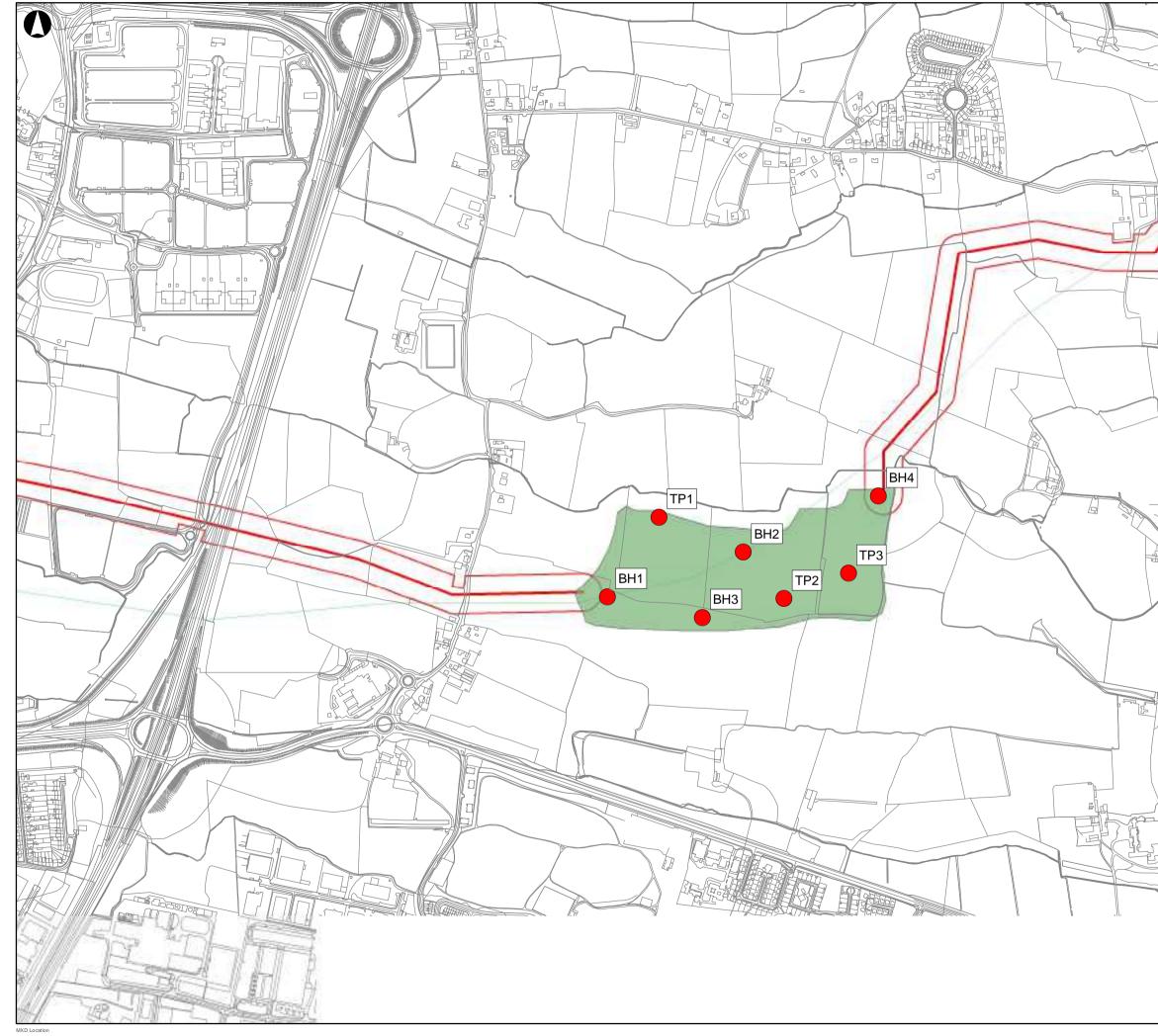
REPORT NUMBER

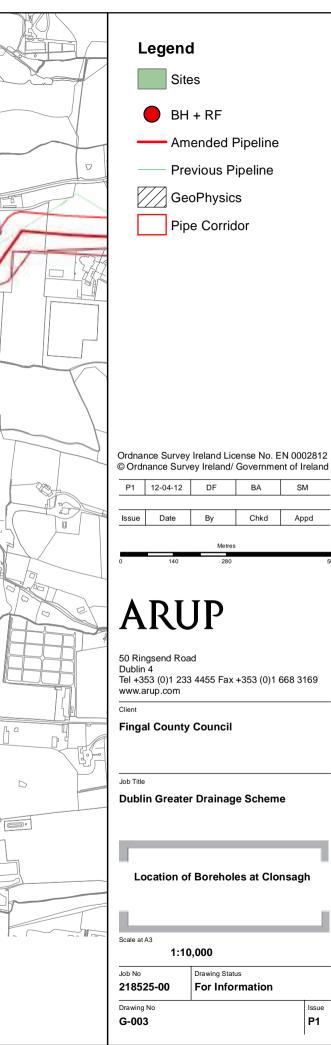
00	31.														1	669	5
ONTI	RACT	G	Freate	er Dublin [Drainage	Scher	ne						LLHOLE	NO	RC		
<u>`0_0</u>	RDINA	TES										SHE			She	et 3 of	3
	IND LE		(mO	D)							Casagra	DAT nde C6	'e drilli 'e loggi	ED ED		3/2013 3/2013	
LIEN				County C	Council			FLUSH INCLINATI	ON (dea)		Air/Mist -90		LLED BY		М	. Newla	and
NGIN			ga.	eeuniy e	ourion			CORE DIA		m)	82		GED BY		JL		
Ê Ê																	
th (%	%	%	Frac	4	e										ails	
Downhole Depth (m) Core Run Depth (m)	T.C.R.%	.C.R.%	Q.D.%	Spac	cing	Zoł				Descrip	tion					Det	alue
Sun ole	j i i	Ś	Ř	Lo (mi		Itaci	σ			Descrip				(E	ion	pipe	> z
<u>Downhole Uepth (m)</u> Core Run Depth (m)	-					Non-intact Zone	Legend							Depth (m)	Elevation	Standpipe Details	SPT (N Value)
				0 250) 500 	ž	Le							ŏ	Ξ	t.	5 S
20 20.1	100	57	34		<pre>k</pre>			Medium st	rona thinly	sized disse bedded gre	v fine arair	ed agrillace	eous			X	
20.5	50				Ē			LIMESTO	NE with occ	asional me	dium to wid	delv spaced	k			\mathbb{K}	1
20.9	95	80	31	E.		Á x Á		Weatherin	g: Negligab	le	SIGUR IVIUL	JOI ONL.				$\langle \rangle \rangle$	
21	100	73	42	Ē		/		Discontinu	ities 18.0-2	2.15m 0-10	° very clos	ely to med	ium) XX	
21.5 21.8	400	90	37					spaced sm	nooth plana	r tight to pa ced fracture	rtlv open. c	lean. Occa	sional			\mathbb{K}	}
21.0 22 22.1	100	-	0					21.26-21.3	30m Soft to	firm black (CLAY with	some suba	angular	22.15		\gg	
2 22.1	10			1	Ē	<u>, , , , , , , , , , , , , , , , , , , </u>		SYMMETR	RIX DRILLI	s of very we				22.10	1		}
								returns of	LIMESTON	IE		,					1
																$\langle \rangle \rangle$	
23																	
																\mathbb{K}	1
									(5					24.00		$\langle \rangle \rangle \rangle$	}
24								End o	ot Borehole	at 22.15 m							
25																	
-0																	
26																	
27																	
28																	
29																	
EMA	RKS	1		I				I						WA	TER S	RIKE	DETAILS
lole ca	ased (0.00-1	8.00r	m					Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Co	mmen	ts	
									Cunto	- 0001	/			N	lo wate	r strike	recorded
														GR		VATE	
NSTA	LLAT		DETA	ILS					Date	Hole Depth	Casing Depth	Depth t Water	Com	ments	5		
Del	te	Tin D	onth	RZ Top	RZ Base	9	Typ	00	15-03-13	20.50	18.00	17.30		level r	ecorded	at end o	f chift
Dat 20-03		18.0		15.00	18.00	-	50mn		19-03-13	20.50	18.00	18.70			ecorded		

Appendix B

Clonshaugh - Site Plan, Graphs and Logs

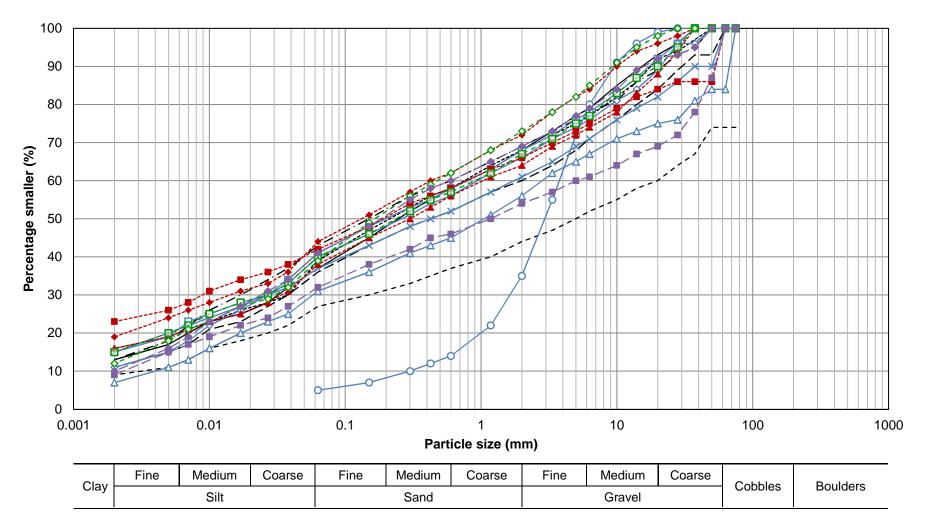
B1





©Arup

SM



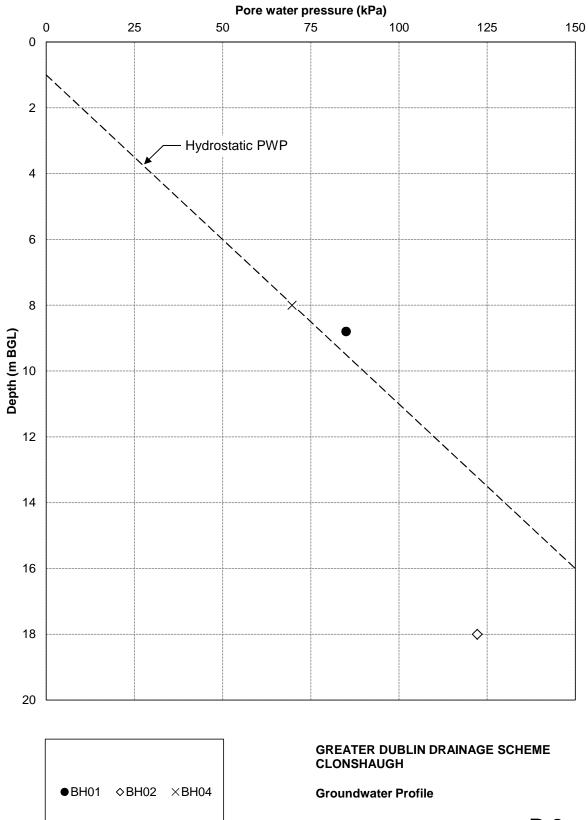
—— TP01 (0.5 m)	TP02 (0.6 m)	TP02 (1.6 m)
— — – TP03 (2.0 m)	— · — · TP09 (1.0 m)	—□— BH01 (2.0 m)
→ BH01 (4.0 m)	<u> </u>	—o— BH01 (8.0 m)
→ BH01 (10.5 m)	■ BH02 (1.0 m)	→ BH02 (3.0 m)
▲ BH02 (9.5 m)	⊡ - BH03 (3.0 m)	� - BH03 (5.0 m)
— ■ – BH04 (1.0 m)	—	

GREATER DUBLIN DRAINAGE SCHEME CLONSHAUGH

Particle Size Distribution

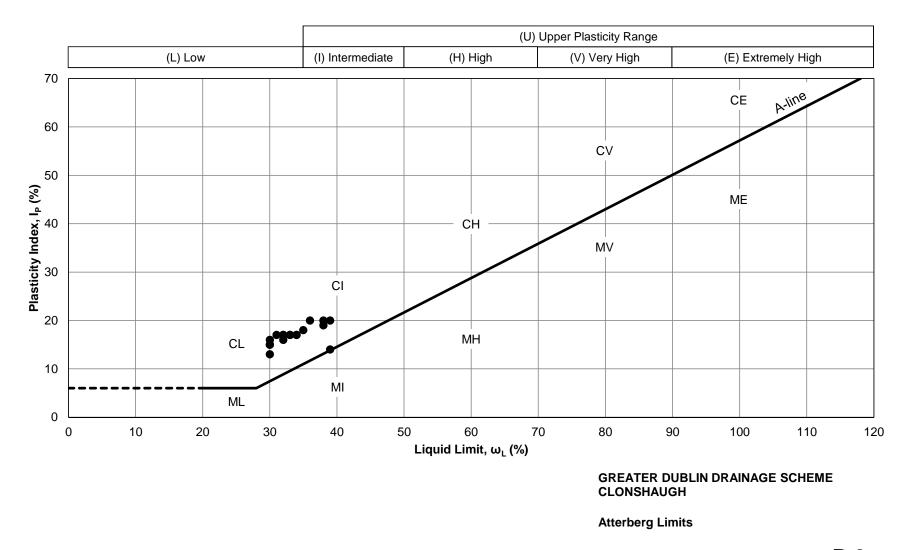
B.1

218525-00



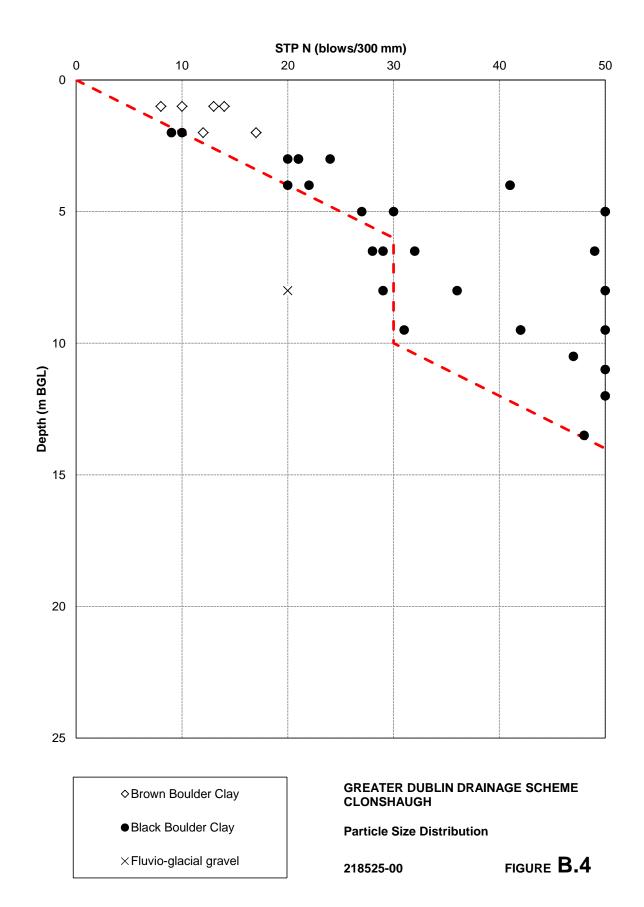
218525-00

FIGURE **B.2**



218525-00 Fl

FIGURE **B.3**



2		т	RIAL PIT F	RECO	RD			REPORT NUMBER					
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TPO	1		
LOG	GED BY	JL	CO-ORDINAT	ES			TARTE	Sheet 1 of 1 ED 23/01/2013					
			GROUND LE	/EL (m)					DATE COMPLETED23/01/2013EXCAVATIONKubota KX080-3a				
CLIE		Fingal County Council						METHO					
									Sample	s	(Pa)	ometer	
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
- 0.0 - -	TOPSO CLAY. S	IL: Soft to firm brown to grey brown sli Sand is fine to medium.	ghtly sandy	<u>17. 17. 17.</u> <u>17. 17. 17.</u> 17. 17. 17. 17.									
	content.	ey brown sandy gravelly CLAY with a lo Sand is fine to coarse. Gravel is suba ded fine to coarse of limestone. Cobbl ded of limestone.	ngular to		0.40			AN4615	В	0.50-0.70			
1.0 	1.40 - 1. with a m	.60m - Pocket of grey subrounded med nedium cobble content	dium GRAVEL				(Seepage)						
2.0	with a lo	stiff dark grey black slightly sandy grav w to medium cobble content. Sand is . Gravel is subangular to subrounded to tone. Cobbles are subrounded of limes	fine to fine to coarse		1.75			AN4616	В	1.90-2.00			
	with a lo	ery stiff dark grey black slightly sandy w cobble content. Sand is fine to medi to subrounded fine to medium of limes angular to subrounded of limestone.	ium. Gravel is		2.50			AN4617	В	2.60-2.70			
-	End of 1	Frial Pit at 3.20m		<u> </u>	3.20								
- - - - 4.0													
- - - -													
		Conditions page at 1.30m				<u> </u>	<u> </u>					<u> </u>	
Goo	bility d												
	eral Rema erminated	arks on stiff clay											

	1	
10		7
10	93	a,/

TRIAL PIT RECORD

16695

Firm brown mottled grey brown sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine	TP02 Sheet 1 of 1 23/01/2013 23/01/2013 Kubota KX080 (ebdy tsp Long Long Kubota KX080 (bdf) Kubota KX080 (bdf) Kubota KX080 (bdf) Kubota KX080 (bdf) (Hand Penetrometer
LOGGED BY JL CO-ORDINATES DATE STARTED CLIENT ENGINEER Fingal County Council GROUND LEVEL (m) Date Started Date COMPLETED Geotechnical Description geotechnical De	23/01/2013 23/01/2013 Kubota KX080 (Eda) (Kba) (Kba)	
OGGED BY JL DATE COMPLETED CLIENT Fingal County Council GROUND LEVEL (m) DATE COMPLETED INGINEER Geotechnical Description Image: State of the state of t	Cepty Cepty Aano Cepty Cane Cepty Cane Cepty Cane Cepty Cane Cepty Cane Cepty C C Cepty C C C Ce	
Clent Fingal County Council INGINEER Geotechnical Description Samples Geotechnical Description Image: Samples Geotechnical Description Image: Samples Image: Samples Image: Samples <t< th=""><th>Depth Vane Test (KPa)</th><th></th></t<>	Depth Vane Test (KPa)	
Geotechnical Description understand understand understand understand 0.0 TOPSOIL: Soft to firm grey brown sandy CLAY. Sand is fine to medium. Understand Under		Hand Penetrometer
0.0 TOPSOIL: Soft to firm grey brown sandy CLAY. Sand is fine to medium. Attribute to the second secon		Hand Penetror
0.0 TOPSOIL: Soft to firm grey brown sandy CLAY. Sand is fine to medium. Attribute to the second secon		Hand Pen
Soft to firm yellow brown to brown slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of limestone. 0.40 0.40 Firm brown mottled grey brown sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine 0.60 AN4618 B 0.40	60.0 80	
Soft to firm yellow brown to brown slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of limestone.	60-0 80	
gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of limestone. Firm brown mottled grey brown sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine	60-0 80	
Firm brown mottled grey brown sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine		
10 to coarse of limestone.		
AN4619 B 1.	60-1.70	
Stiff dark grey black slightly sandy gravelly CLAY with a low to medium cobble content. Sand is fine to medium. Gravel is AN4620 B 1.5	85-2.00	
.0 subangular to subrounded fine to coarse of limestone.Cobbles are subangular to subrounded of	2.00	
Stiff to very stiff dark grey black slightly sandy gravelly CLAY (9	80-3.00	
Gravel is subangular to subrounded fine to coarse of limestone.		
End of Trial Pit at 3.15m		
		<u> </u>
roundwater Conditions ry		
itability		
Sood		
General Remarks		
Vit terminated on stiff clay		

10	1								REPORT NU	JMBER	
0.0	131.	RIAL PIT	RECO	RD					166	695	
CON	TRACT Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP0	3 t 1 of 1	
LOG	GED BY JL	CO-ORDINAT	ËS				DATE S		23/01	/2013	
CLIE	INT Fingal County Council	GROUND LE	VEL (m)				EXCAV/ METHO	ATION	ETED 23/01/2013 Kubota KX080-3a		
ENG											<u> </u>
								Sample	s	KPa)	romete
	Geotechnical Description		pr	c	tion	Water Strike	ele		_	Vane Test (KPa)	Hand Penetrometer (KPa)
			Legend	Depth (m)	Elevation	Wate	Sample Ref	Type	Depth	Vane	Hand (KPa)
0.0	TOPSOIL: Soft brown slightly sandy gravelly C fine to coarse. Gravel is subangular to subrout	CLAY. Sand is nded fine to	<u>11</u> . <u>11</u> . <u>11</u> . <u>11</u> . <u>1</u> .								
-	medium of various lithologies. Soft to firm yellow brown slightly sandy silty Cl	LAY. Sand is	×	0.40				_			
-	fine to medium.						AN4611	В	0.50-0.65		
-	Firm becoming stiff dark grey brown slightly sa CLAY with a low to medium cobble content. S	andy gravelly and is fine to		0.90			AN4612	В	0.90-1.10		
-	medium. Gravel is subangular to subrounded to of limestone. Cobbles are subangular to subro limestone.	fine to coarse									
-	intestore.										
-											
2.0							AN4613	В	2.00-2.10		
-											
-											
-											
3.0	Stiff to very stiff dark grey black slightly gravel	lv slightly silty		3.20							
	CLAY with a medium cobble content. Gravel is to subrounded fine to coarse of limestone. Col subrounded of limestone.	s subangular	- - - 8				AN4614	В	3.50-3.60		
-				3.85				D	5.50-5.00		
4.0	End of Trial Pit at 3.85m			3.05							
-											
-											
F											
	Indwater Conditions					1					1
601 9/											
Gen	eral Remarks										
ין דוג גפ 2 2	erminated on stiff clay										



10030

14	and?	5															
	NTRAC		ater Dublin	Drainage S		-							BOREH SHEET		NO.	BH01 Sheet 1 of 2	
	-ordin. Ound L	ATES .EVEL (m	AOD)		BO		.e diame .e depti		(mm)	2	0ando 20 200 4.80		DATE (DATE (ED04/02/2013ED05/02/2013	
	ent Gineer	Fing	al County	Council		SPT HAMMER REF. NO. SPT6 ENERGY RATIO (%) 55							BORED BY WC PROCESSED BY JL				
(c									_	<u> </u>		Sam	nples				
Depth (m)			Des	cription			Legend		Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)		Recovery	Field Test Results	Standpipe Details
0	Firm d	ark brown	sandy gra	velly CLAY		-	<u> </u>										
- 1						4 					AN3091	В	1.00-1.4	45		N = 10 (2, 2, 2, 2, 3, 3)	
2							• • •		2	.80	AN3092	В	2.00-2.4	45		N = 12 (3, 3, 2, 3, 4, 3)	
- 3	Stiff bla and bo	ack sandy oulder con	v silty CLA' tent	r with a low	to medium col	bble 1714	×				AN3093	В	3.00-3.4	45		N = 21 (3, 4, 4, 5, 5, 7)	
- 4						-1.1.1.1	· · · · · · · · · · · · · · · · · · ·				AN3094	В	4.00-4.4	45		N = 41 (6, 7, 9, 11, 11, 10)	
- 5					<u> </u>	× × ×				AN3095	В	5.00-5.4	45		N = 50/220 mm (16, 9, 14, 17, 19)		
- 6							× × × ×		7	.30	AN3096	В	6.50-6.	95		N = 32 (4, 7, 7, 9, 7, 9)	
- 8	Sand i to med	s coarse. lium of lin	Gravel is s nestone.	eyish black s subangular f	fine 0	0 0 0 0 0 0 0		8	.70	AN3097	В	8.00-8.4	0-8.45		N = 20 (3, 4, 4, 5, 5, 6)		
9				ny siity CLA m boulder c	Y with a mediu ontent	E <u> </u>	×				AN3098	в	9.50-9.	95		N = 42 (5, 8, 9, 11, 12, 10)	
-					1111	 				AN3099	в	10.50-10	0.95		N = 47 (9, 10, 10, 11, 12, 14)		
HA		RATA BO	RING/CHI	SELLING			10/-1				Deals -			Time -	WA	TER STRIKE DET	AILS
Fron	n (m) 🛛	Го (m)	Time (h)			Water Strike		Casing Depth		Sealed At	Rise To		Time (<u>min)</u>	Co	omments		
5 12	4.6 4.7 0.75 5.1 5.4 0.75 12.55 12.75 0.75 14.4 14.8 1.5						7.30		7.30		8.70	2.40		20		Rapid	
										0	-			GRO	UNDWATER PRO	GRESS	
	TALLA ⁻ Date	TION DET		05-02-		Hol Dep 7.30	th	Casing Depth 7.30	W	pth to ater 0.00		of Shift					
RE	MARKS								D · B · LB	- Small E Bulk Di	e Legence Disturbed (tub) sturbed Bulk Disturbed ronmental Sam	ł	(ia) 1 T. +)		P - Undis	sturbed 100mm Diameter Samp sturbed Piston Sample er Sample	le



1	6	6	9	5
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	and,															
	NTRAC		ter Dublin	Drainage S						<u> </u>		BOREHO SHEET	OLE NO	BH01 Sheet 2 of 2		
	-ordin Ound L	ATES .EVEL (m .	AOD)		BOR		DLE DIAMETER (mm) 200 DLE DEPTH (m) 14.80					DATE COMMENCED 04/02/2013 DATE COMPLETED 05/02/2013				
	ent Gineer	Finga	al County (Council		SPT HAMMER REF. NO.SPT6ENERGY RATIO (%)55						BORED BY WC PROCESSED BY JL				
Ē											San	nples			e	
Depth (m)				cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details	
11	Stiff to cobble	very stiff b and a low	lack sand; to mediun	y silty CLA` n boulder c	Y with a medium ontent <i>(continue</i>	ad) + 12714 12714 1	X			AN3100	В	12.00-12.4		N = 50/285 mm (8, 10, 12, 12, 14, 12)		
- 14						1 1 1 1 1 1 1 1 1 1 1	×		14.80	AN3101	В	13.50-13.9	95	N = 48 (14, 10, 12, 9, 13, 14)		
15	End of	Borehole	at 14.80 m	ו					14.00							
- 16																
17																
18																
- 19																
20																
- 21																
HA	RD ST	RATA BOR	RING/CHIS	ELLING									w	ATER STRIKE DET	AILS	
Fron	IARD STRATA BORING/CHISELLING om (m) To (m) Time (h) Comments								asing Jepth	Sealed At	Ris To		ime nin)	Comments	_	
5 12	4.6 4.7 0.75 5.1 5.4 0.75 12.55 12.75 0.75 14.4 14.8 1.5									7.11		<u>, (I</u>				
								Late	Oreitz			GR	OUNDWATER PRO	GRESS		
4.6 4.7 0.75 5.1 5.4 0.75 12.55 12.75 0.75 14.4 14.8 1.5 INSTALLATION DETAILS Date Tip Depth RZ Top RZ Base Type REMARKS REMARKS							Dat	e	Hole Depth	Casing Depth	De W	pth to later	Comme	nts		
RE	MARKS								B - Bulk I LB - Lard	Die Legend Disturbed (tub) Disturbed e Bulk Disturbed vironmental Sam	d	Vol. Triti	P - Ur	ndisturbed 100mm Diameter Samp idisturbed Piston Sample /ater Sample	le	



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CO	NTRAC	CT Gr	eater Du	ublin E	Drainage S	Scheme								BORE		E NO.	BH02			
		NATES LEVEL (I	m AOD))				'E OLE DIAM OLE DEPT		(mm)	2	0ando 20 00 2.00	00		CON	/MENC	Sheet 1 of 2 CED 31/01/2013 ED 04/02/2013			
	ENT		ngal Cou	unty C	ouncil		SPT HA	MMER RE	ER REF. NO. SPT6						BORED BY WC					
ENG	SINEEF	۲.					ENERG	r Ratio (%	ATIO (%) 55						PROCESSED BY JL					
Depth (m)				Desc	ription		Legend			Ueptn (m)	Ref. Number	Sample Type	Depth	(L)	Recovery	Field Test Results	Standpipe Details			
0	Firm		n mottle	ed gre	y brown s		3 			AN3082	в	1.00-1.4			N = 14 (3, 4, 4, 3, 4, 3)					
2	Stiff t	o very stif dium cobl			2.	2.60	AN3083 AN3084	В	2.00-2. 3.00-3.			N = 17 (2, 3, 2, 4, 5, 6) $N = 24$ (3, 4, 6, 6, 7, 5)								
4									AN3085	В	4.00-4.45			N = 41 (6, 7, 8, 10, 11, 12)						
5												AN3086 AN3087	В	5.00-5. 6.50-6.			N = 50/245 mm (10, 9, 11, 14, 16, 9) N = 49 (5, 9, 11, 11, 13, 14)			
8							9.	00	AN3088	В	8.00-8	.45		N = 50/225 mm (14, 9, 13, 16, 19, 2)						
9	Very stiff to hard black slightly sandy gravelly CLAY with a low to medium cobble and boulder content											AN3089	В	9.50-9.	.95		N = 50/125 mm (18, 7, 26, 24)			
HA		RATA B		CHIS	ELLING				· 								TER STRIKE DET	AILS		
ron	n (m)	To (m)	Time (h)	omments		Wate Strike		asing Depth		Sealed At	Rise To		Time (min		omments					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$															No water strike					
										Hole	<u>,</u>	Casing	Der	oth to	-		UNDWATER PRO	GRESS		
0.1 0.4 1 9.6 9.9 0.75 11.7 12 1 INSTALLATION DETAILS 1 Date Tip Depth RZ Top RZ Base Type REMARKS 1 1 1 1								Dat	e	Dept		Depth	W	oth to ater	Co	mment	ts			
REN	MARK	5								B-	- Large	e Legend Disturbed (tub) sturbed Bulk Disturbed onmental Sam	1	(ial + Tub)		P - Undi	isturbed 100mm Diameter Samp sturbed Piston Sample er Sample	le		



1	6	6	9	5
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1	0	6														
со	NTRAC	T Gre	eater Du	ublin [Drainage S	Scheme							BOREHO SHEET	OLE N	O. BH02 Sheet 2 of 2	2
	ORDIN	IATES LEVEL (r	n AOD))				'E OLE DIAM OLE DEPT		nm)	Dando 20 200 12.00	00			ENCED 31/01/2013	5
			gal Cou	unty C	ouncil						SPT6		BORED		WC	
EN	GINEEF	<u>.</u>					ENERG	(RATIO (%	%) 		55		PROCES	SED	BY JL	
Depth (m)				Desc	ription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)			Standpipe Details
- 11	Very s a low	stiff to har to mediur	d black n cobbl	slight le and	tly sandy g I boulder o	gravelly CL content (co	AY with ntinued)			12.00	AN3090	В	11.00-11.4	45	N = 50/220 mm (12, 12, 16, 18, 16)
12 13 14 15 16 17 18 19 20 21	End c	f Borehol	e at 12.	.00 m												
H/	ARD ST	RATA BO	DRING/	CHIS	ELLING									\		TAILS
		To (m)	Time (h)		omments			Wate		asing epth	Sealed At	Ris To		ime nin)	Comments	
3 8 9 1	3.7 6 3.1 9.6 1.7	3.9 6.2 8.4 9.9 12	1 0.5 1 0.75 1									10			No water strike	OGPESS
								Dat	e	Hole	Casing	De	pth to	Comm		JUGRESS
	Date	Tip Dep		Тор	RZ Base	Тур	De		.~	Depth	Depth	W	later			
	MARKS	\$ 				I				LB - Bulk	I Disturbed (tub) Disturbed ge Bulk Disturbed wironmental Sam	ł	Vial + Tub)	P -	Undisturbed 100mm Diameter S Undisturbed Piston Sample Water Sample	ample



10030

	NTRAC	I Gre	ater Dubli	Uraina	age Si	uneme							BOREH SHEET		0.	BH03 Sheet 1 of 1	
	-ordin Ound L	ATES _EVEL (n	n AOD)					'e Dle diam Dle dept		nm)	Dando 20 200 10.00		DATE (DATE (ED 06/02/2013 D 06/02/2013	
	ent Gineer		gal County	Counc	il			MMER RE			SPT6 55		BORED PROCE		BY	WC JL	
(San	nples				đ
Depth (m)			De	scriptio	n			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	Recoverv		Field Test Results	Standpipe
0	TOPS	OIL: Soft	dark brow	n sandy	y grav	elly CLAY		<u>x¹ 1₁ x¹ 1₁ x</u>	-	0.40							
	Firm li	ght browr	n sandy gr	avelly C	CLAY				2	0.40	_						
1										1.60	AN3836	в	1.00-1.4	15		N = 13 (2, 2, 3, 4, 3, 3)	
2	Firm to cobble	o stiff blac and bou	ck gravelly Ider conte	CLAY nt	with a	low to me	edium				AN3837	в	2.00-2.4	15		N = 9 (2, 2, 2, 2, 2, 3)	
3											AN3838	в	3.00-3.4	15		N = 21 (3, 4, 4, 5, 5, 7)	
4											AN3839	в	4.00-4.4	15		N = 20 (2, 4, 4, 5, 5, 6)	
5										5.00	AN3840	в	5.00-5.4	15		N = 27 (4, 5, 6, 7, 7, 7)	
6	coarse mediu Stiff be	e. Gravel m of lime ecoming v with a lov	dark brow is subangu stone. very stiff b v to mediu	ular to s	ubrou	nded fine andy grav	to relly		τ 	5.80	AN3841	в	6.50-6.9	95		N = 29 (3, 6, 6, 7, 7, 9)	
в											AN3842	в	8.00-8.4	15		N = 36 (10, 12, 9, 8, 9, 10)	
9	End of	Porchold	e at 10.00							10.00	AN3843	в	9.50-9.9	95		N = 42 (8, 12, 11, 12, 10, 9)	
10	End of	Borenoie	e at 10.00	m													
HA		RATA BO	RING/CH	ISELLI	NG							I	I		WA	TER STRIKE DET	AILS
ron	n (m) ⁻	To (m)	Time (h)	Comme	ents			Wate Strike		asing epth	Sealed At	Ris To		Гіте min)	Co	mments	
7	.8 7 .5 .2	5.9 7.2 7.9 9.3	0.5 0.75 1 1					5.80		5.80		5.3	0	20		Slow	
														G	RO	UNDWATER PRO	GRES
	TALLA Date	TION DE	TAILS th RZ To	D RZ E	Base	Тур)e	Dat	e	Hole Depth	Casing Depth	De W	pth to ater	Comm	ents	5	
REN	MARKS	Borehol	e terminat	ed at re	quirec	I depth				D - Sma B - Bulk	Die Legeno I Disturbed (tub) Disturbed ge Bulk Disturbed			P -	Undist	turbed 100mm Diameter Samp turbed Piston Sample r Sample	le



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1	-															
со	NTRAC	r Grea	ter Dublin	Drainage S	Scheme							BOREH SHEET		0.	BH04 Sheet 1 of 1	
	-ordin ound l	ATES .EVEL (m	AOD)				e Dle Diame Dle Depti		nm) 2	Dando 20 200 10.00	000		COMME		D 07/02/2013	
	ENT	Finga	al County (Council		SPT HAN	IMER REF	. NO.		SPT6		BORED		D)/	WC	
	GINEER					ENERGY	RATIO (%	o)	5	55		PROCE	SSED	Bĭ	JL	
(Ê								Ĕ	<u> </u>			· ·	5	<u></u>		be
Depth (m)			Des	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	Recovery		Field Test Results	Standpipe Details
- 0	Soft lig	ht brown s	sandy CLA	Y with a lo	w to medi	um	0.0							-		
Ē			brown sar	ndy CLAY v	vith a low	to			0.60	-						
E F 1	mediu	n cobble o	content	,			<u> </u>			AN3844	в	1.00-1.4	45		N = 8 (1, 2, 2, 2, 2, 2)	
															(1, 2, 2, 2, 2, 2, 2)	
	0.111								1.80							
2	cobble	content a	/ sandy gra nd a low to	avelly CLAN medium b	r with a m oulder cor	ntent				AN3845	В	2.00-2.4	45		N = 10 (2, 3, 3, 2, 3, 2)	
															· · · · · · · · · · · · · · · · · · ·	
- 3										AN3846	в	3.00-3.4	45		N = 20 (3, 4, 4, 5, 5, 6)	Î
Ē															(0, 1, 7, 0, 0, 0)	
4							\overline{O}			AN3847	в	4.00-4.4	45		N = 22 (3, 4, 5, 5, 6, 6)	
-															(3, 4, 3, 3, 0, 0)	Î
- 5										AN3848	в	5.00-5.4	45		N = 30	
															(4, 6, 7, 7, 8, 8)	
																Î
6																
							\overline{O}			AN3849	В	6.50-6.9	95		N = 28 (5, 6, 6, 7, 7, 8)	
															(
7																•
																•
															N = 29	
8							$\phi \cdot \phi \cdot \phi$			AN3850	В	8.00-8.4	15		(6, 7, 7, 7, 7, 8)	
							$\overrightarrow{0}$									
9							Ó.,									
										AN3851	в	9.50-9.9	95		N = 31	
									10.00						(7, 7, 6, 8, 8, 9)	
10	End of	Borehole	at 10.00 n	ו												
HA	ARD STR		RING/CHIS	ELLING									,	WAT	ER STRIKE DE	TAILS
		To (m)	Time	omments			Water		ising s pth	Sealed At	Ris To		Time min)		nments	
	l.7	4.9	0.75											N	o water strike	
7	6 7.5	6.2 7.75	0.75													
	9	9.35	0.75										-		NDWATER PRO	CBEe
INS			AILS				Date	e	Hole	Casing	De	pth to /ater	Comm			JORES
	Date		n RZ Top	RZ Base	Ту	pe			Depth	Depth	V	aiel				
07	-02-13	8.00	2.00	8.00	50mn	n SP										
RE	MARKS	Borehole installed.	terminated	d at require	d depth. 5	50mm diam	eter stand	pipe			d		U -	- Undistu	rbed 100mm Diameter San	nple
		installed.							LB - Large	Disturbed (tub) isturbed Bulk Disturbed	d		P -	- Undistu - Water	rbed Piston Sample	
									Env - Envi	ronmental Sam	nple (Jar + '	Vial + Tub)				



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

Ű.	93	a./														'	009	0
CON	NTR/	АСТ	G	Greate	er Dublin E	Drainage	Sche	me						LHOLE	NO	RC		
0-	ORE	DINA	TES						RIG TYPE			Knebel				26/0	et 1 of 2 2/2013	
CLII	ENT			(mO ingal	D) County C	ouncil			FLUSH INCLINATI			Air/Mist -90	DRIL	E LOGGE	,	Pe	2/2013 etersen	
		ER							CORE DIA	METER (m	nm)		LOG	GED BY	,	D	O'Shea	1
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac Lo (mr 0 ²⁵⁰	cing g m)	Non-intact Zone	Legend			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0									Cased dov	wn Shell &	Auger Hole							
1 2 3 4 5 6 7 7 8 8 9																		
	IAR e cas		.00-1	8.00	m		•		•	Water	Casing	Sealed	Rise	Time		TER S		DETAILS
										Strike	Depth	At	To	(min)				recordec
											Hole	Cooine	Derthi		GRO)UND	VATER	DETAIL
	TAL Date			DETA	ILS RZ Top	R7 Rac	۵	Ту	ne	Date	Hole Depth	Casing Depth	Depth to Water	Com	ments	8		
	02-1		8.8		6.80	8.80		50mn		-								



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

6	83	a,/															009	0
CON	NTR/	АСТ	G	Greate	er Dublin D	Drainage S	Sche	me						LHOLE	NO	RC		
co-	ORD	DINA	TES										DATE	= I E DRILL	ED		et 2 of 2 2/2013	
GRO	DUN	D LE	VEL	(mO	D)				RIG TYPE FLUSH			Knebel Air/Mist	DATE	LOGG	ED		2/2013	
	ENT		F	ingal	County Co	ouncil		1	INCLINATIO		ım)	-90		LED BY GED BY			etersen O'Shea	
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac Loy (mr 0 250	cing g n)	Non-intact Zone	Legend			Descript	ion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10									Cased dov	vn Shell & J	Auger Hole ((continued)			10.50			
-11									SYMMETF returns of r	RIX DRILLI madegrour	NG: No recc nd consisting	vvery, obser of Shell & /	ved by drill Auger Fill	er as				
- 13 - 14																		
15									SYMMETF returns of g and boulde	grey sandy	NG: No recc gravelly clay	overy, obser / with occas	ved by drill ional cobb	er as les	14.80			N = 75/12 mm (25, 50) N = 50/12 mm (14, 11, 3: 18)
17															18.00			N = 50/23 mm (13, 12, 15 18, 14, 3)
18									End c	or Borehole	at 18.00 m							N = 50/11 mm (16, 9, 29, 2
REN	/IAR	KS													WAT	FER S	 Trike	DETAILS
Hole	e cas	sed 0	.00-1	8.00	m					Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Co	mmen	ts	
															N	o wate	r strike	recorded
															GRO)UND	NATEF	
		LATI								Date	Hole Depth	Casing Depth	Depth to Water	Com	nments	6		
	Date 02-1		Tip D 8.8		RZ Top 6.80	RZ Base 8.80		Typ 50mm										



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

100	93	38														-	005	
cor	NTR/	АСТ	G	Freate	er Dublin I	Drainage	e Sche	eme							NO	RC		2
co-	ORE	DINA	TES										DATI	e i E drill	ED		et 1 of 2/201:	
GRO	OUN	D LE	VEL	(mOl	D)				RIG TYPE FLUSH			Knebel Air/Mist	DAT	E LOGG	ED		2/201	
	ENT SINE		F	ingal	County C	Council	1		INCLINATI		m)	-90		LED B' GED B'			etersei .O'She I	
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spa Lo (m 0 ²⁵⁰	cing og m)	Non-intact Zone	Legend			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0									Cased dov	vn Shell &	Auger Hole							\$
-1 -2 -3 -4 -5 -6 -7 -8 -9									SYMMETF returns of	RIX DRILLI madegrour	NG: No rec nd consisting	overy, obse g of Shell &	rved by dril Auger Fill	ler as	6.50			
	AR a cas		.00-1	8.00r	n					Water	Casing	Sealed	Rise	Time		TER S		DETAILS
										Strike	Depth	At	То	(min)				e recordec
															GRO		NATE	R DETAIL
NS	TAL	LATI		DETA	ILS					Date	Hole Depth	Casing Depth	Depth to Water	Con	nments			
	Date		Tip D	epth	RZ Top	RZ Bas	e	Тур	be				1					



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

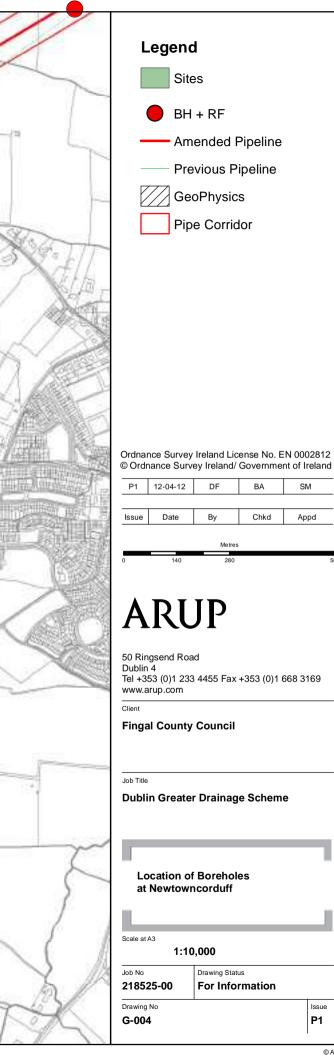
G,	93	1/															000	5
CON	ITR/	АСТ	G	ireate	er Dublin E	Drainage	Sche	me						LHOLE	NO	RC		
20-	ORE		TES										SHE				et 2 of	
			VEL	(mOl	D)				RIG TYPE			Knebel		e drilli E loggi			2/2013 2/2013	
CLIE					County C	ouncil			FLUSH INCLINATI CORE DIA		m)	Air/Mist -90		LED BY GED BY			etersen .O'She	
(F	n)										/							
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lo (mr 0 ²⁵⁰	cing vg m)	Non-intact Zone	Legend			Descript	ion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10										madegroun	NG: No reco d consisting			ler as	12.00			
12									returns of	RIX DRILLI grey sandy nd boulders	NG: No reco very gravelly	very, obser / clay with o	ved by dril occasional	ler as		-		N = 50/1 ⁻ mm (16, 9, 32,
								Ò.							13.60			
4									and bould	grey sandy	NG: No reco gravelly clay	very, obser with occas	ved by dril sional cobb	ler as les			 • •<	N = 44 (7, 9, 11, 10, 10)
15									G G G G								o o o o o o	N = 50/2 mm (10, 12, 1
16																	• • • •	12, 12, 1
17									returns of	grey fine sa					<u>17.40</u>		0 0 0 0	N = 44 (6, 10, 12 10, 13)
18								8	returns of and bould	grey sandy ers.	NG: No reco gravelly clay at 18.00 m	very, obser with occas	ved by dril sional cobb	ler as les	18.00			N = 50/1 mm (17, 8, 29,
19																		
		Ke													14/ 4 -			
	HAR cas		.00-1	8.00r	m					Water	Casing	Sealed	Rise	Time		mment		DETAILS
										Strike	Depth	At	То	(min)	+			recorded
															GRO		NATER	
NS	TAL	LATI		ETA	ILS					Date	Hole Depth	Casing Depth	Depth to Water	Com	ments			
	Date 02-1		Tip D 18.0		RZ Top 13.00	RZ Base 18.00	9	Ty 50mn		26-02-13	18.00	18.00	13.30			ecorded	10mins a	after end of

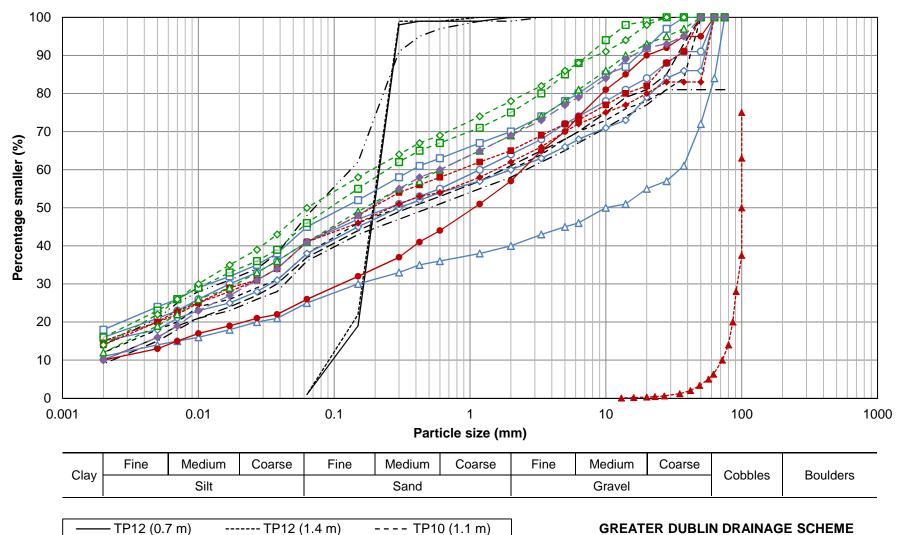
Appendix C

Newtowncorduff - Site Plan, Graphs and Logs









—<u>∧</u>— BH07 (6.5 m)

---+ BH08 (5.0 m)

- ← - BH04 (3.0 m)

 $- \cdot - \cdot TP11 (2.0 \text{ m})$

→ BH07 (4.0 m)

---- BH08 (2.0 m)

--- - BH09 (11.0 m)

— — – TP11 (1.2 m) — □— BH07 (2.0 m)

---- BH08 (8.0 m)

----> - BH09 (5.0 m)

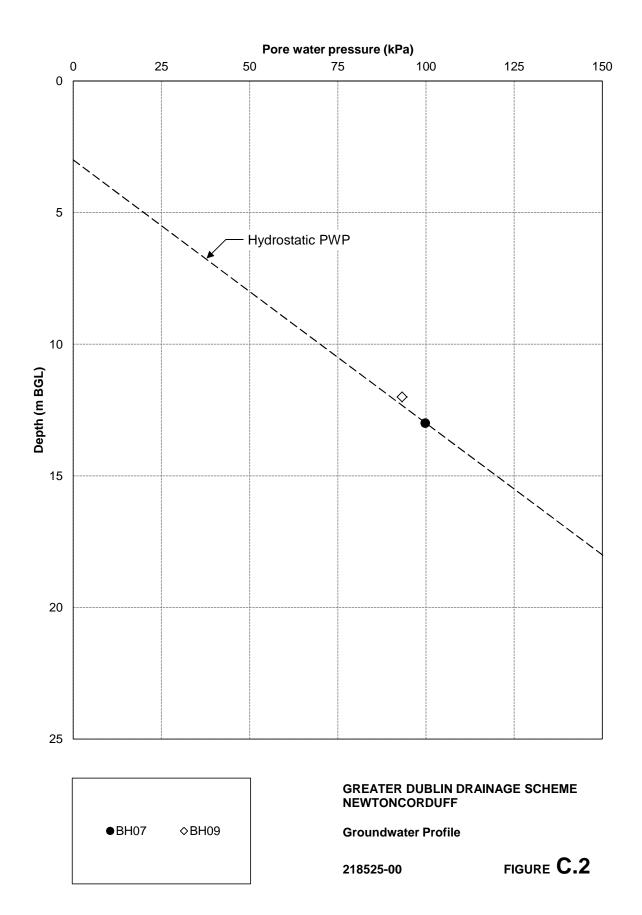
GREATER DUBLIN DRAINAGE SCHEME
NEWTONCORDUFF

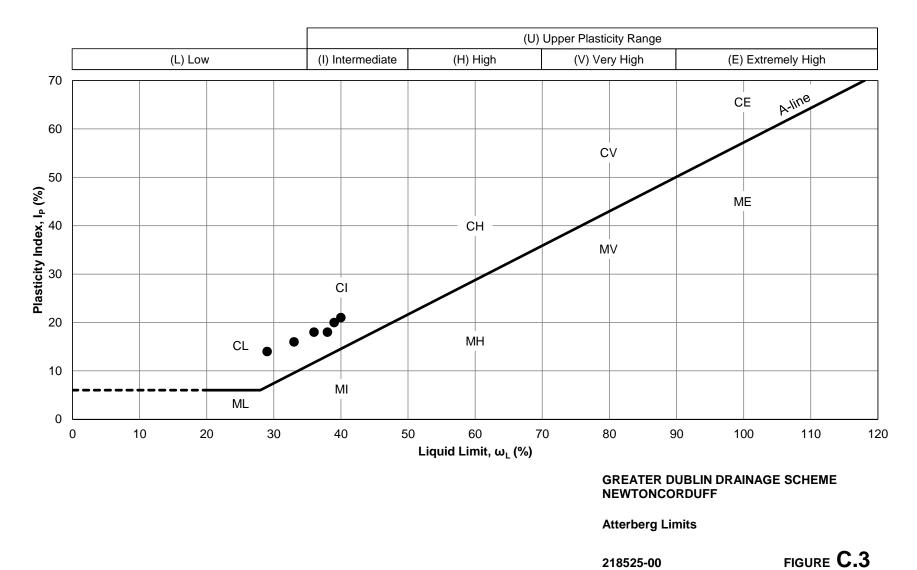
Particle Size Distribution

FIGURE

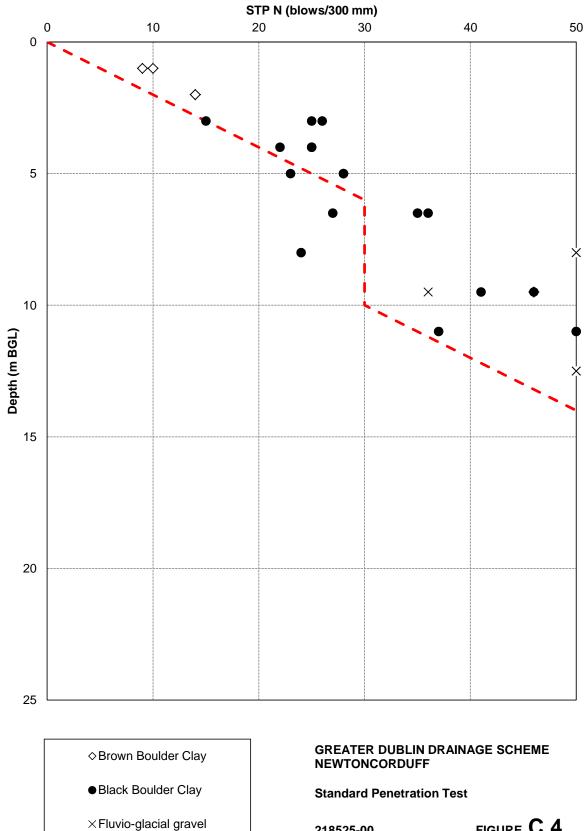
C.1

218525-00





218525-00



218525-00

FIGURE C.4

1	2
$(\mathcal{E}$	
03	31,

IGSL TP LOG 16695.GPJ IGSL.GDT 5/4/13

TRIAL PIT RECORD

REPORT NUMBER

1	200												
CON	TRACT	Greater Dublin Drainage Scheme	1					TRIAL P SHEET	IT NO.	TP10 Sheet 1 of 1			
LOG	GED BY	JL	CO-ORDINAT						TARTED OMPLET		3/2013 3/2013		
CLIE ENGI	NT INEER	Fingal County Council	GROUND LE	/EL (m)				EXCAVA METHO		Hitachi Zaxis 80SB			
		Geotechnical Description		p	_	tion	Water Strike	le	Samples		Vane Test (KPa)	Hand Penetrometer (KPa)	
				Legend	Depth (m)	Elevation	Wate	Sample Ref	Type	Depth	Vane	Hand (KPa)	
_ 0.0 _ _ _	mediur			<u>x 1/2</u> 1/ · <u>x 1/2</u> · <u>x</u> · <u>x 1/2</u> · <u>x 1/2</u>	0.45								
-	Sand is to med Firm to	firm brown and yellow brown sandy gra s fine to medium. Gravel is angular to s ium of limestone. stiff grey brown occasionally mottled y y slightly silty CLAY with a medium cob	ellow brown		0.80			AA0211	В	0.50-0.60			
- 1.0 	and a l	ow boulder content. Gravel is angular to coarse of limestone. Cobbles and bouk gular to subrounded of limestone (up to	o subrounded ders are					AA0212	LB	1.10-1.20			
- - - - - -	CLAY mediur	iff to hard dark greyish brown slightly s with a low to medium cobble content. S n. Gravel is subangular to subrounded stone. Cobbles are subrounded of lime	and is fine to fine to coarse		1.80			AA0213	В	2.00-2.10			
-	End of	Trial Pit at 2.60m			2.60								
- 3.0 - - - -													
- - 4.0 -													
- - - -													
Dry		Conditions					·						
Stab Good													
	eral Rem rminated	arks I on very stiff clay											

1	D								I	REPORT NU	JMBER	
00	931		TRIAL PIT	RECO	RD					16695		
CON	ITRACT	Greater Dublin Drainage Scheme						TRIAL P	NO.	TP1		
			CO-ORDINAT	ES				- SHEET DATE S	TARTED		t 1 of 1 /2013	
LOG	GED BY	JL		\/EL (m)				DATE C	OMPLET	TED 07/03		
CLIE ENG	ENT INEER	Fingal County Council	GROUND LE			1		EXCAV/ METHO		Hitacl	ni Zaxis	80SB
									Samples	3	(Pa)	ometer
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSO	IL: Soft light brown CLAY		$\frac{\sqrt{1_{x}}}{\sqrt{1_{y}}} \frac{\sqrt{1_{y}}}{\sqrt{1_{y}}} \frac{\sqrt{1_{y}}}{\sqrt{1_{y}}}$								
-	Soft light slightly s	t brown occasionally mottled yellow lill in the second secon	brown sandy		0.50			AA0214	В	0.60-0.70		
- - - -	Sand is	stiff grey brown occasionally mottled ravelly CLAY with a low to medium c fine to medium. Gravel is subangula	r to subrounded		0.95			AA0215	В	1.20-1.30		
-	fine to co limeston	parse of limestone. Cobbles are sub e.	rounded of					AAUZ 15	В	1.20-1.30		
2.0	predomi	grey to dark greyish brown slightly ith a medium cobble content. Sand i Gravel is subangular to subrounde nantly fine to medium of limestone. Ilar to subrounded of limestone.	d fine to coarse	-101 - 001 - 001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1001 - 1	1.80			AA0216	LB	2.00-2.10		
	End of T	rial Pit at 2.70m			2.70							
3.0												
- - -												
4.0												
-												
	undwater	Conditions										
Stab Good												
	eral Rema erminated o	irks on stiff clay										

1	1									REPORT NU	JMBER		
23	131.	Т	RIAL PIT I	RECO		16695							
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	'IT NO.	TP12 Sheet 1 of 1			
LOG	GED BY	JL	CO-ORDINAT	ES				- SHEET DATE S DATE C		D 23/01	/2013 /2013		
CLIE		Fingal County Council	GROUND LEV	/EL (m)					EXCAVATION Kub			0-3a	
ENG	NEER											ů.	
									Sample	es	(Pa)	omete	
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
0.0		L: Soft brown to grey brown sandy SI	LT with	A 14 . 3. 14	0.05	ш	\$	S R	É.		>	т÷	
-	\occasior	al rootlets. Sand is fine to medium. tely Compact) Grey mottled orange bi im SAND with rare rootlets	/						_				
-		Im SAND with rare rootlets tely Compact) Brown to grey brown fil			0.40			AN4605	В	0.30-0.40			
-	SAND							AN4606	В	0.70-0.90			
-	() () () () () () () () () () () () () (1.00								
-	occasior	tely Compact) Grey medium to coarse nal shell fragments	SAND WITH										
-								AN4607	В	1.40-1.50			
-													
-													
2.0							1						
-	End of T	rial Pit at 2.30m			2.30		(Seepage)						
-													
-													
3.0													
-													
-													
4.0													
-													
-													
	indwater (age at 2.3	Conditions		<u> </u>			1		<u> </u>			<u> </u>	
	יay c aι ∠.3	om.											
Stab	ilitv												
Very	poor stabi	lity with sidewall collapse from 0.40m	- 1.40m										
	eral Rema	irks due to sidewall instability											
3													

1	1									REPORT NU	JMBER	
23	331.	Т	RIAL PIT I	RECO	RD					16695		
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP13		
LOG	GED BY	JL	CO-ORDINAT	ES				DATE S		D 07/03	t 1 of 1 \$/2013 \$/2013	
CLIE	INT	Fingal County Council	GROUND LEV	/EL (m)				EXCAV/ METHO		Hitachi Zaxis 809		
									Sample	es	Pa)	ometer
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSO Sand is	IL: Soft brown sandy CLAY with freque	ent rootlets.	× <u>+</u>	0.05							
	silty CLA	rm light grey brown slightly sandy slig Y with rare rootlet. Sand is fine to me gular to subrounded fine to medium o	dium. Gravel					AA0206	В	0.40-0.50		
- - - - -	sandy gr	y to grey brown occasionally mottled o ravelly CLAY. Sand is fine to medium. Ilar to suborunded fine to coarse of lim	Gravel is		0.90			AA0207	В	1.10-1.20		
	Soft to fi sandy C	rm brown mottled orange, yellow and LAY. Sand is fine to medium.	light grey blue		1.75			AA0208	В	1.80-2.00		
- - -	Uncomp lense of	act dark grey brown silty SAND with o soft silt. Sand is fine to medium.	ccasional		2.20		(Seepage)	AA0209	В	2.60-2.70		
3.0	CLAY. S	ery stiff dark greyish brown slightly sa Sand is fine to medium. Gravel is suba ded fine to medium of limestone.	ndy gravelly ngular to		2.80			AA0210	В	2.80-3.00		
-	End of T	rial Pit at 3.20m			3.20							
- - - -												
	indwater It seepage	Conditions at 2.40m								ł		
Stab Poor		m. Sidewall collapse from ground leve	l upon completi	on of dig.								
	eral Rema	rks on stiff to very stiff clay										



16695

1	œ	5														
	NTRAC		iter Dublin	Drainage S	Scheme		-			D 1 55		BOREH SHEET	OLE N	0.	BH07 Sheet 1 of 1	
	-ordin Ound I	ATES LEVEL (m	AOD)				e)le diami)le dept		nm)	Dando 20 200 10.60			DATE COMMENCED 07/03/2013 DATE COMPLETED 08/03/2013			
	ENT GINEER	0	al County	Council			/IMER REI ' RATIO (%			SPT6 55		BORED BY WC PROCESSED BY JL				
						LINENGI		0)		55		nples			JL	
Depth (m)			Des	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type		Recovery		Field Test Results	Standpipe Details
0	Soft to	firm light	brown san	dy gravelly	CLAY		<u></u> .									
- 1	Firm c	lark brown	silty sand	/ gravelly C	LAY			- - -	1.30	AN8543	в	1.00-1.4	15		N = 10 (3, 4, 4, 2, 2, 2)	
2					- - - -		AN8544	в	2.00-2.4	15		N = 14 (3, 3, 3, 4, 4, 3)				
3	Firm b CLAY	ecoming s with a low	tiff black s to mediun			3.10	AN8545	в	3.00-3.4	15		N = 15 (3, 4, 4, 4, 3, 4)				
4								AN8546	В	4.00-4.4	15		N = 25 (5, 5, 6, 6, 6, 7)			
5										AN8547	В	5.00-5.4	15		N = 28 (3, 6, 6, 8, 7, 7)	
7										AN8548	В	6.50-6.9	95		N = 36 (4, 6, 7, 9, 9, 11)	
8									8.90	AN8549	В	8.00-8.4	15	(6	N = 50/285 mm 5, 8, 11, 13, 14, 12)	
9		o very stiff (m cobble o		n sandy silty	y CLAY wi	th a			10.60	AN8550	В	9.50-9.9	95	(7	N = 46 ', 7, 10, 11, 10, 15)	
	End o	f Borehole	at 10.60 n	1												
		RATA BO	Time				Wate	r Co	sing	Sealed	Ris	e 1	l Fime		R STRIKE DET	AILS
	. ,	To (m)	(h) C	omments			Strike		epth	At	To		min)	Com	ments	
7 8	.85 7.2 8.9 0.4	2.95 7.4 9.1 10.6	0.5 0.75 0.75 1												water strike	
									Hole	Casing		nth to			IDWATER PRO	GRESS
	TALLA Date	TION DET	AILS	RZ Base	Ту	pe	Dat	e	Hole Depth	Casing Depth	W	pth to /ater	Comm	ients		
REI	MARKS	;						1	D - Smal B - Bulk LB - Larg	Die Legeno I Disturbed (tub) Disturbed ge Bulk Disturbed vironmental Sam	d	Vial + Tub)	P -	Undisturb Undisturb - Water Sa	ed 100mm Diameter Sam ed Piston Sample mple	ple



10030

1	-	5														
	NTRAC		ater Dubli	n Drainage	Scheme							BOREH SHEET		10.	BH08 Sheet 1 of 2	
	-ordin Ound	IATES LEVEL (m	n AOD)				E DLE DIAME DLE DEPTI	•	nm)	Dando 20 200 12.60			ATE COMMENCED 05/03/2013 ATE COMPLETED 06/03/2013			
	ENT		gal County	Council		SPT HAN	MMER REF	F. NO.		SPT6		BORED BY WC				
ENC	GINEER					ENERGY	' RATIO (%	6)	1	55			ESSED BY JL			
<u> </u>								u	Ê			nples		2		be
Depth (m)			De	scription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)		кесоvery	Field Test Results	Standpipe Details
- 0	Soft b CLAY		irm dark b	rown sand	ly gravelly sil	ty	- <u>xo</u>									
- 1	CLAT									AN8525	в	1.00-1.4	45		N = 9 (2, 2, 2, 3, 2, 2)	
2								· · ·		AN8526	в	2.00-2.4	45		N = 14 (2, 3, 3, 3, 4, 4)	
- 3		lack sandy m cobble		ntly gravelly	y CLAY with			3.20	AN8527	В	3.00-3.4	45		N = 25 (4, 4, 5, 6, 7, 7)		
4										AN8528	В	4.00-4.	45		N = 25 (3, 5, 5, 6, 6, 8)	
5										AN8529	В	5.00-5.4	45		N = 28 (5, 5, 7, 7, 6, 8)	
7	Stiff d	ark brown	sandy gr	avolly silty	CLAY with a	low to			7.20	AN8530	В	6.50-6.			N = 27 (4, 6, 6, 7, 6, 8)	
	mediu	m cobble	content						7.80							
8					brown silty s arse GRAVE	EL Í				AN8531	В	8.00-8.4			N = 50/190 mm (12, 13, 16, 18, 16)	
9			lar to sub	rounded fir	ne to coarse				9.80	AN8532	в	9.50-9.9	95		N = 36 (4, 7, 8, 8, 9, 11)	
- 10	GRAV Stiff b		lightly gra	velly CLA	/ with a low t	0	0000		10.40	_						
E LIA				ISELLING										10/0		
		To (m)	Time				Wate		asing	Sealed	Ris		Time		TER STRIKE DET	AILO
<u> </u>	5.8	3.9	(n)	Commonite			Strike 7.80		epth '.80	At 10.50	<u>To</u> 7.0		<u>min)</u> 20	+	Slow	
7 8 9	.8 3.2 9.8 2.4	.8 7.9 0.5 .2 8.6 1 .8 10 0.75			7.00			10.00	7.0		20		5.011			
<u> </u>									Hole	Casing	De	oth to			UNDWATER PRO	GRESS
	NSTALLATION DETAILS Date Tip Depth RZ Top RZ Base Type						Date	e	Depth	Depth	W	pth to ater	Comn	nent	S	
	Date			p KZ Bas	le Typ	e										
9 12 INS REF	MARKS	;				B - Bulk I LB - Larg	Die Legeno I Disturbed (tub) Disturbed Je Bulk Disturber vironmental Sam	d	U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample							



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- I	О	Ο	Э	U

	-	5														
со	NTRAC	T Grea	ater Dublin	Drainage S								BOREHC SHEET	DLE NO	BH08 Sheet 2 of 2		
	-ordin Ound L	ATES _EVEL (m	AOD)		BOR		: Le diami Le dept		mm) 🛛	Dando 20 200 12.60	00	DATE CO	DATE COMMENCED 05/03/2013 DATE COMPLETED 06/03/2013			
1	IENT GINEER	Fing	al County (Council								BORED BY WC				
						.ngt	RATIO (%	'oj	1			nples	CESSED BY JL			
Depth (m)			Dese	cription			Legend	Flevation	Depth (m)	Ref. Number	Sample Type		Recovery	Field Test Results	Standpipe Details	
- 11	mediu	m cobble	content (co	elly CLAY v intinued) unded fine	with a low to	14.15.15.15			12.50 12.60	AN8533	В	11.00-11.4	5	N = 37 (7, 9, 8, 8, 10, 11) N = 50/75 mm (22, 3, 46, 4)		
13 14 15 16 17 17 18 18			at 12.60 m	ſ												
20																
HA	ARD STI	RATA BO	RING/CHIS	ELLING										ATER STRIKE DET	AILS	
Fror	m (m) ⁻	To (m)	Time (h) C	omments			Wate Strike		asing Jepth	Sealed At	Ris To		me nin)	Comments		
-	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						12.60		2.60	, "	11.0	`	20	Moderate OUNDWATER PRO	GRESS	
INS	INSTALLATION DETAILS							e	Hole	Casing	De	pth to ater 0	Comme			
	Date Tip Depth RZ Top RZ Base Type								Depth	Depth	N	/ater	Jonnie	1160		
3.8 3.9 0.5 7.8 7.9 0.5 8.2 8.6 1 9.8 10 0.75 12.4 12.6 1 INSTALLATION DETAILS Date Tip Depth RZ Top RZ Base Type REMARKS Image: Constraint of the second sec									B - Bulk E LB - Larg	le Legence Disturbed (tub) Disturbed e Bulk Disturbec rironmental Sam	i	Vial + Tub)	P - Ur	ndisturbed 100mm Diameter Samj disturbed Piston Sample /ater Sample	ble	



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	20	6																
со	NTRAG	CT Gre	ater Dub	lin Drai	inage S								!	BOREH SHEET		e no.	BH09 Sheet 1 of 2	
		NATES LEVEL (n	n AOD)			1		e Dle Diami Dle Dept		(mn	ו) 2	0ando 20 200 1.70		DATE (DATE (CED06/03/2013ED07/03/2013	
	ENT GINEEF		gal Coun	ty Cour	ncil			/MER REI RATIO (%				6PT6		BORED			WC JL	
									9					ples			02	
Depth (m)			D	escript	ion			Legend	ī	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	(111)	Recovery	Field Test Results	Standpipe Details
- 0		o firm light									1.30	AN8534	В	1.00-1.4	45		N = 10 (2, 2, 2, 2, 3, 3)	
2						y gravelly C			-		2.70	AN8535	В	2.00-2.4	45		N = 20 (3, 4, 4, 5, 5, 6)	
3		elack silty s um cobble		ghtly gr	avelly C	CLAY with a	a low to					AN8536	В	3.00-3.4	45		N = 26 (4, 6, 6, 7, 7, 6)	
4												AN8537	В	4.00-4.4	45		N = 22 (3, 4, 5, 5, 6, 6)	
5												AN8538	В	5.00-5.4	45		N = 23 (3, 4, 5, 5, 6, 7)	
7	Stiff c medi	lark brown um cobble	sandy g content	ravelly	CLAY	with a low to	0				6.80	AN8539	В	6.50-6.9	95		N = 35 (6, 7, 7, 8, 11, 9)	
											9.00	AN8540	В	8.00-8.4	45		N = 24 (4, 5, 5, 6, 6, 7)	
- 9	Media Media fine to Very	um cobble um dense o coarse G	content silty sand SRAVEL. silty sand	ly suba Sand i ly sligh	angular is fine to	CLAY with a to subround o medium. relly CLAY v	ded				<u>9.40</u> 9.60	AN8541	В	9.50-9.	95		N = 41 (6, 7, 8, 10, 12, 11)	
HA	ARD ST	RATA BO		HISELI	LING												TER STRIKE DET	AILS
Fror	n (m)	To (m)	Time (h)	Comr	nents			Wate Strike		Casir Dept		Sealed At	Rise To		Tim (min	1.	omments	
9	6 9 .75 1.4	6.2 9.2 9.9 11.7	0.5 0.75 0.75 1.5					9.40		9.40		10.00	8.60		20		Slow	CREEC
			TAU 0							н	ole	Casing	Der	oth to	6		UNDWATER PRO	GRESS
INS	Date	Tip Dep	TAILS oth RZ T	op RZ	Z Base	Туре	Э	Date	e		epth	Depth	Ŵ	ater		mment	15	
	MARK	6									D - Small E B - Bulk Di LB - Large	e Legend Disturbed (tub) sturbed Bulk Disturbed onmental Samp		fial ± Tub)		P - Undi	sturbed 100mm Diameter Samp sturbed Piston Sample er Sample	ble



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	2													
со	NTRAC	CT Gre	eater Dublin	Drainage S	Scheme						BOREHC SHEET	DLE NO	D. BH09 Sheet 2 of 2	
	-ORDIN	NATES LEVEL (r	n AOD)		BOR	Type Ehole dian Ehole dep ⁻		nm) 🛛	Dando 20 200 11.70	00			NCED 06/03/2013	
	IENT GINEEF		gal County	Council					SPT6				WC	
	GINEEP	•			ENE	RGY RATIO (. ⁷ 0)	1	55	Sam	PROCES	SED B	BY JL	
Depth (m)			Des	scription		Legend	Elevation	Depth (m)		Sample Type	Depth (m)	Recovery		Standpipe Details
- 11	Very	stiff black	silty sandy	slightly grav	relly CLAY with a		-		AN8542	В	11.00-11.4	5	N = 50/255 mm (9, 11, 11, 12, 16, 11)	
			e at 11.70			X(3	11.70	_					
12	End C	Dorenoi	e al 11.701											
13														
E 13														
Ē														
14														
- - 15														
16														
- 17														
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Ē														
- 18														
- - 19														
-														
-														
20														
E E 21														
Ē														
Ē														
			Time			Wat	er Ca	asing	Sealed	Rise	e Ti	me	VATER STRIKE DET	AILS
	m (m) 6	To (m) 6.2	(h) 0.5	Comments		Strik		epth	At	То		nin)	Comments	
9 1	9 .75 1.4	9.2 9.9 11.7	0.75 0.75 1.5											
		TION ST						Hole	Casing	Der	oth to		ROUNDWATER PRO	GRESS
INS	Date	Tip Dep		RZ Base	Туре	Da	ate	Depth	Depth	Ŵ	oth to ater	Comme	ents	
					71									
9 1 INS	MARK	5					I	B - Bulk D	le Legend Disturbed (tub) Disturbed		I_	P - L	Jndisturbed 100mm Diameter Samp Jndisturbed Piston Sample Water Sample	ble
5								LB - Larg Env - Env	e Bulk Disturbed	ı ple (Jar + V	/ial + Tub)	VV - 1	Water Sample	



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со	NTR	АСТ	G	reate	er Dublin [Drainage	Sche	me						HOLE	NO	RC		
со	-ORD	DINA.	TES										SHEE				et 1 of 2	
	OUN			(mOl	וח				RIG TYPE			Casagrand		DRILLI LOGGI	ED		4/2013 4/2013	
	IENT				County C	Council			FLUSH INCLINATI	ON (dea)		Air/Mist -90		ED BY			. Newla	
	GINE	ER		J **						METER (mn		90		ED BY		JL		
E	(E																6	
epth	epth	R.%	R.%	.Q.D.%	Frac		one										etail	(e)
ole D	Ŭ ur	T.C.R.%	S.C.R.%	R.Q.	Spa Lo	bg	act Z				Descriptio	n			(m	u	pe D	Valu
Downhole Depth (m)	Core Run Depth (m)				(m	m)	Non-intact Zone	Legend							Depth (m)	Elevation	Standpipe Details	SPT (N Value)
	ပိ				0 250) 500	No	Le							De	Ele		SР
- 0									Cased dov	vn Shell & A	uger Hole							
Ē																		
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Ę																		
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7																		
Ē															7.50			
Ē									SYMMETR returns of	RIX DRILLIN Shell & Auge	G: No recov er Fill	ery, observ	ved by drille	r as				
8																		
Ē																		
Ē																		
- 9																		
Ē																		
	MAR	KS													W/^7	LEB 61		DETAILS
	e cas		.00-1	5.0m						Water		Sealed	Rise	Time (min)		mment		
										Strike 12.00	Depth	At	То	(11111)	-			
																	A/ A	
	STALI	וד	ם אט	FTA	II S					Date	Hole	Casing	Depth to Water	Com	GRC		VAIER	R DETAILS
	Date				RZ Top	RZ Base		Ту		Date	Depth	Depth	Water			,		
04	-04-1		13.0		11.50	13.00		50mn										



REPORT NUMBER

Q,	55	a./							_						ĺ	665	15
	NTR/	АСТ	G	reate	r Dublin Drainage	Sche	eme						LHOLE	NO	RC		
0-	ORD	INA	ES									SHE	et E drill	FD		et 2 of 3	
GRO	DUN	D LE	VEL	(mOl)			RIG TYPE			Casagran		E LOGG	ED)4/2013	
CLII	ENT				County Council			FLUSH			Air/Mist -90		LED B			I. Newla	and
		ER						CORE DIA	METER (m	m)	90	LOG	GED B	r 	JI		
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			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10									RIX DRILLII Shell & Aug		overy, obse <i>tinued)</i>	rved by dril	ler as	10.60			
									RIX DRILLI		overy, obse	rved by dril	ler as				
11																	
							°							12.00			
12								SYMMET returns of		NG: No rec	overy, obse	rved by dril	ler as			• •	
							· · · · ·	SYMMET	RIX DRILLII	NG: No rec	overy, obse	rved by dril	ler as	12.80		• •	
13								returns of	gravelly CL	AY		.,		13.50			
							No C	returns of	gravelly BO		overy, obse Possible W						N = 50/0 (25, 50
14							P	Rockhead)								*
														15.00			
15		100	86	49		4 · 		medium gi widely spa bands. We	rained argill ced very thi athering: L	aceous LIN in medium : oss of wall	bedded dar IESTONE v strong black strength to	with mediur < MUDSTO very weak	n to NE in	10.00			N = 50/0 (25, 50
16	16.40					-		16.48m)	,		nated mude	,	10 -				
		100	97	16		<u> </u>					0° extremely baced smoo		ght,				
17 1 1	17.10 17.16	100		0	E			fragments	of argillace	ous limesto	r to subang one wiith so bvertical sr	me black cl	ay				
1 18	17.80	94	78	45		Λ÷λ.		with thin (1 17.34-17.4	I-2mm thick	k) brwon CL e 60° smoo	AY veneer		au iy	17.80			
								· ·	of Borehole)				
19																	
REN	/IAR	KS												WAT	 Fer s'	 TRIKE	DETAILS
			00-1	5.0m					Water Strike 12.00	Casing Depth	Sealed At	Rise To	Time (min)		mmen		
														GRO	JUND	WATE	R DETAIL
			ON D				τ	20	Date	Hole Depth	Casing Depth	Water	Con				
	Date 04-1		īp D∉ 13.0	-	RZ Top RZ Base 11.50 13.00	8	Typ 50mm		03-04-13 04-04-13 04-04-13	12.50 12.50 17.80	12.50 12.50 15.00	DRY 10.00 9.30	Wate		ecorded	at start of at end of	of shift f borehole



REPORT NUMBER

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С	ON	TRA	СТ	G	reate	r Dublin [Drainage	Sche	me							NO	RC	09 et 1 of :	2
С	:0-0	ORD	INA	TES										DAT		ED		et 1 of 2 4/2013	
G	RO	UNI	D LE	VEL	(mOl	D)				RIG TYPE FLUSH			Casagrano Air/Mist	de C6DAT	E LOGG	ED	06/0	4/2013	
	LIE		ER	Fi	ngal	County C	ouncil			INCLINATI	ON (deg) METER (mr	n)	-90 90		LED BY		M JL	. Newla	and
1	Ê	(m										,	-						
	Downhole Depth (m)	Core Run Depth (m)	R.%	S.C.R.%	R.Q.D.%	Frac		one										Standpipe Details	(e)
		nD	T.C.R.%	S.C.	R.Q.	Spac Lo	g	tact Z	-			Descripti	on			(L	u	ipe D	l Valu
		ore R				(mi		Non-intact Zone	Legend							Depth (m)	Elevation	tandp	SPT (N Value)
- 0		Ű				0 250	500 <u>500 100 100 100 100 100 100 100 100 100 </u>	Ż	تد 	SYMMETE		IG: No reco	verv obser	ved by dri	ller as		Ξ	N N	õ
Ē									o	returns of	boulder clay	IG. NO IECO	very, obser	veu by un	liei as				
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R	EM	AR	٢S						· · · ·	1						WA	i Ter s'	KA KA TRIKE	DETAILS
5	lole	cas	ed 0	.00-1	5.0m						Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Co	mmen	ts	
											11.00								
																GR	OUND	NATEF	RDETAILS
1							D7 -				Date	Hole Depth	Casing Depth	Depth t Water	O Com	nment	S		
	D: 06-0	ate)4-1:		Гір De 12.0		RZ Top 10.00	RZ Base 12.00		Typ 50mn										
3													1						



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

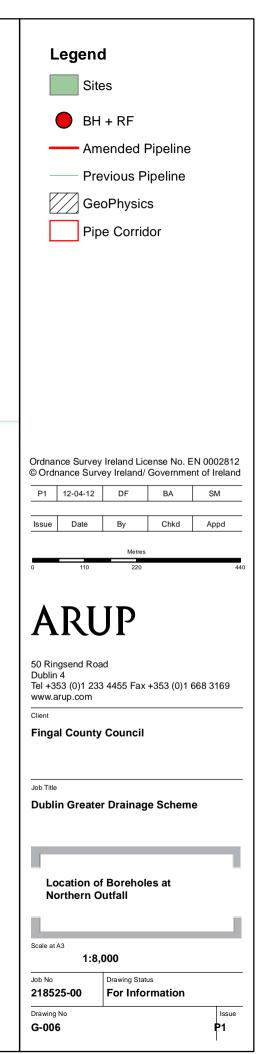
Q	93	a./														I	669	S
col	NTR	АСТ	G	reate	er Dublin D	rainage	Sche	me						LHOLE	NO	RC		
20-	ORD	DINA	TES										SHE				et 2 of 2	
									RIG TYPE			Casagran	de C6 <mark>DATI</mark>	E DRILL E LOGG	ED ED)4/2013)4/2013	
		DLE	VEL						FLUSH			AII/IVIISt						
	ent Sinei	ER	Fi	ngal	County Co	ouncil			INCLINATION CORE DIA		m)	-90 90		LED Bነ GED Bነ		M JL	I. Newla	and
_									JUNE DIA		,		1200	0	-			
Downhole Depth (m)	Core Run Depth (m)	%	%	%			Ð										ails	
Dep	Dept	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac		Zon										Deta	lue)
ole	un [T.O	S.	R.O.	Lo	g	tact	-			Descript	ion			(E	ы	oipe	l Va
wnh	re F				(mn	·	Non-intact Zone	Legend							Depth (m)	Elevation	Standpipe Details	SPT (N Value)
	ပိ				0 250	500	Z								De	Ш		SF
10								<u>· • · · ·</u>	SYMMETH	RIX DRILLI	NG: No reco	overy, obser	ved by dril	er as				
												-/					0 0 0 0 0 0	
								- <u>`</u> -;									0 0	
11																	o Bo	
								<u>.</u>										
12								i										
								<u>`</u>									\mathbb{K}	
															13.00			
13									SYMMETF returns of I	RIX DRILLII black CLAY	NG: No reco ′ (Possible \	overy, obser Neathered	ved by dril Rockhead)	er as				
																	\mathbb{K}	N = 50/1
								F=										mm (6, 19, 5
14								<u> </u>										
								E										
15									Martin			40 4k - 1 1 - 1	a alale - L - L - L		15.00			N 50/0
10									fine graine	d argillaced	ous LIMEST	to thickly be ONE. Weat	equea dark thering:	grey				N = 50/0 r (25, 50)
		100	73	55				H	Negligable									
16							539.9990	999999999	Discontinu	ities 15.0-1	8.0m 0-10° ulating, tight	closely to n t, clean. Ra	nedium spa re brown s	aced urface				
	16.50						<u> </u>		discoloura	tion on frac	ture surface	es (16.50m	& 17.80m)					
							$\Delta \approx \lambda I$											
17																	\mathbb{K}	
		100	67	57				╞┯┼										
						-	/ ia x /											
18	18.00							╞┯╧	End	of Borehole	at 18.00 m				18.00		K///X	
19																		
	MAR				•						<u> </u>	<u> </u>	<u> </u>		WA	TER S	TRIKE	DETAILS
Hole	e cas	sed 0	.00-1	5.0m						Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Co	mmen	ts	
										11.00	T	Γ	T	_		_	_	_
															GRO		WATER	
NS	TALI	LATI	ON D	ETA	ILS					Date	Hole	Casing Depth	Depth to Water	Com	ments			
	Date			-		RZ Base		Тур		05-04-13	Depth 18.00	15.00	10.20	Wate	r level r	ecorded	at end of	
06	-04-1	3	12.0	0	10.00	12.00		50mm	n SP	06-04-13	18.00	15.00	3.30	vvate	i ievel r	ecorded	at start o	n Shift

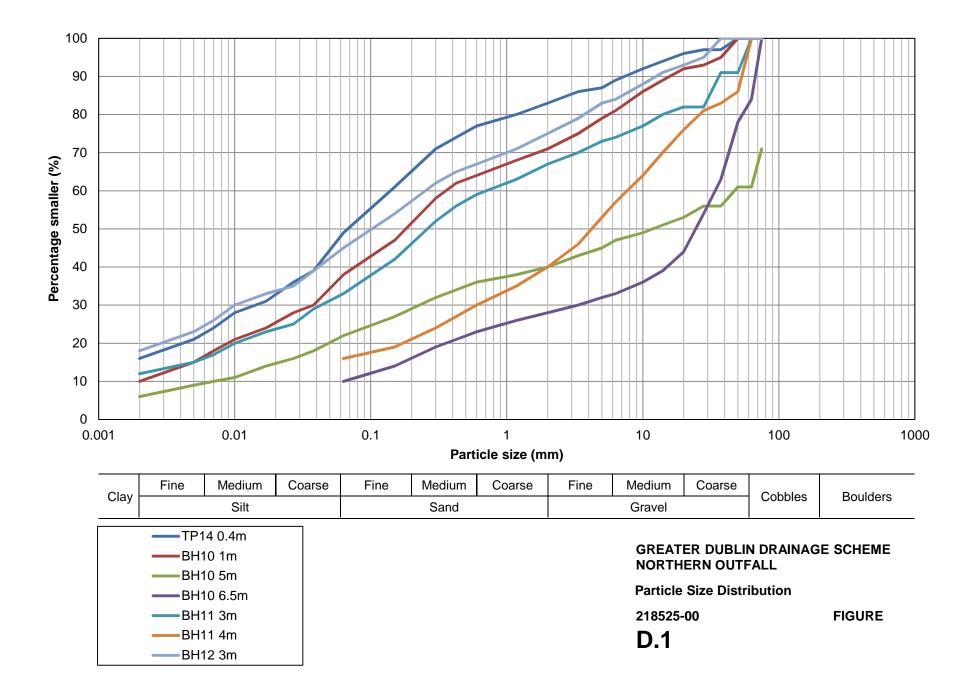
Appendix D

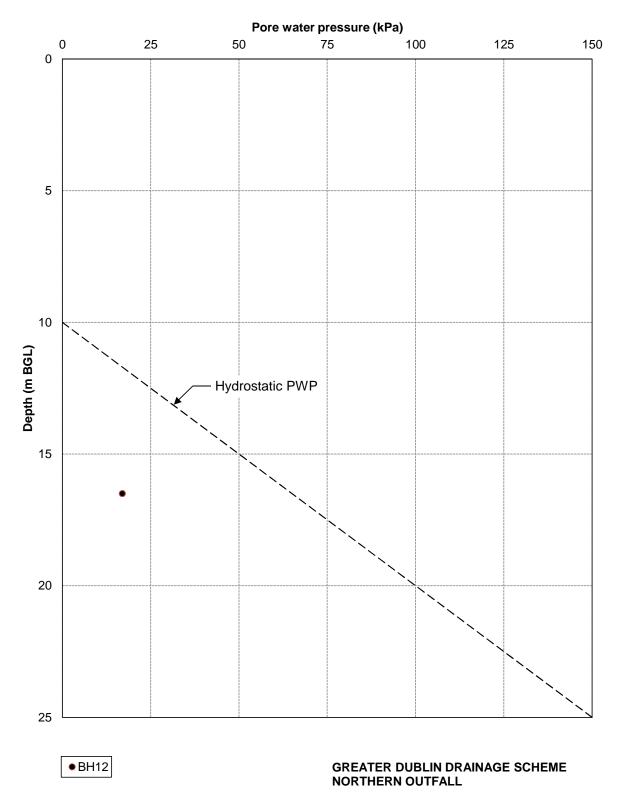
Northern Outfall - Site Plan, Graphs and Logs

D1





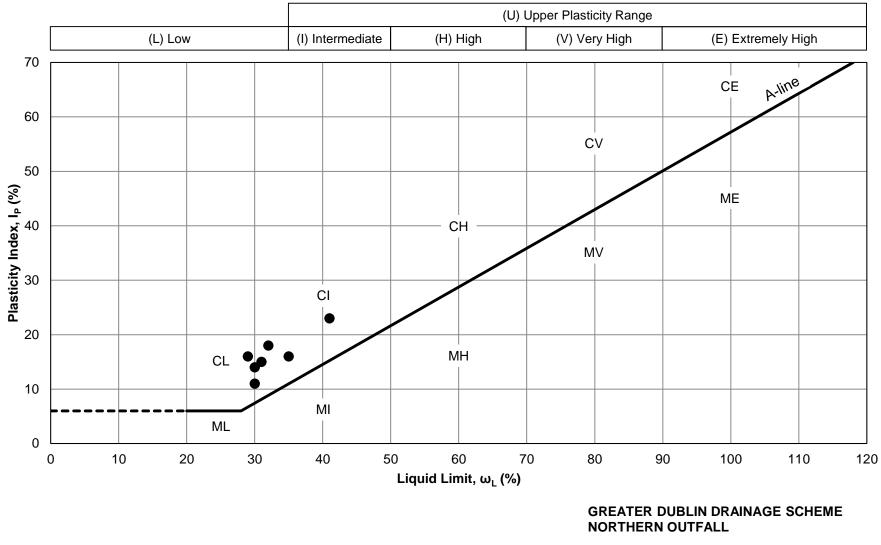




Groundwater Profile

218525-00

FIGURE **D.2**

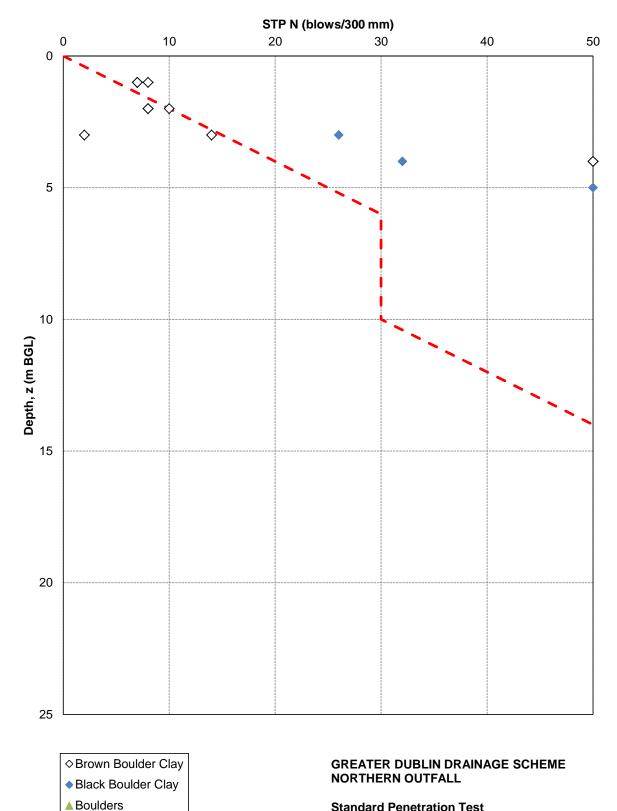


Atterberg Limits

FIGURE

D.3

218525-00



Standard Penetration Test

218525-00

FIGURE D.4

1										REPORT N	JMBER	
2	P 131	I	RIAL PIT	RECO	RD					16	695	
CON	TRACT	Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP1		
LOG	GED BY	JL	CO-ORDINAT	ES				DATE S		D 07/03	t 1 of 1 3/2013	
CLIE	NT	Fingal County Council		VEL (m)				DATE C	ATION		3/2013 hi Zaxis	80SB
	NEER							METHO	D			
									Sample	es	Pa)	meter
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSO to mediu	IL: Soft grey brown slightly sandy CLA	AY. Sand is fine	$\frac{\underline{x}^{\underline{A}} I_{\underline{y}} \cdot \underline{x}^{\underline{A}} I_{\underline{y}}}{I_{\underline{y}} \cdot \underline{x}^{\underline{A}} I_{\underline{y}} \cdot \underline{x}^{\underline{A}} I_{\underline{y}}}$								
-	with a lo medium	wn to orange brown sandy slightly gra w to medium cobble content. Sand is . Gravel is subangular to subrounded tone. Cobbles are subangular to subro ne.	fine to coarse		0.35			AA0221	В	0.40-0.60		
- 1.0 	cobble a Gravel is Cobbles	t orange brown clayey gravelly SAND and medium boulder content. Sand is s angular to subrounded fine to coars and boulders are angular to subround the (up to 350mm)	fine to coarse. e of limestone.	1. 10. 10. 10. 10. 10. 10. 10. 10. 10. 1	1.10			AA0222	LB	1.20-1.30		
2.0 - - - - - - - - - - - - - - - - - - -					3.10			AA0223	В	3.00-3.10		
-	End of T	⊺rial Pit at 3.10m			3.10							
- - - - - - -												
	Indwater	Conditions		<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>				L
Stab Good												
	eral Rema	arks on compact coarse material										

e		т	RIAL PIT	RECO	RD					REPORT NU	JMBER	
CON	TRACT	Creator Dublin Drainage Scheme						TRIAL P		TP1	5	
CON	TRACT	Greater Dublin Drainage Scheme	1					SHEET			b t1 of 1	
LOG	GED BY	JL	CO-ORDINAT	ES				DATE S DATE C			/2013 /2013	
CLIE	INEER	Fingal County Council	GROUND LE	/EL (m)				EXCAV/ METHO		Hitacl	ni Zaxis	80SB
			1						Sample	S	Pa)	ometer
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOI Sand is f	L: Soft to firm brown sandy CLAY wit ine to medium.	h rootlets.	$\frac{x^{1} l_{y}}{l_{f}} \cdot \frac{x^{1} l_{f}}{x^{1}}$								
-	Soft to fir medium. of limesto	m brown sandy gravelly CLAY. Sand Gravel is subangular to subrounded one.	is fine to fine to coarse		0.25			AA0224	В	0.40-0.65		
1.0 								AA0225	В	1.20-1.30		
- - - - - - - -	to subrou	wn sandy gravelly CLAY with a mediu content. Sand is fine to coarse. Grave unded fine to coarse of limestone. Col are subangular to subrounded of lime	obles and		2.10			AA0226	В	2.50-2.70		
3.0	cobble co subangu Cobbles	on slightly sandy gravelly CLAY with a content. Sand is fine to medium. Grave lar to subrounded fine to medium of li are subrounded of limestone. rial Pit at 3.30m	el is		3.00 3.30			AA0227	В	3.10-3.20		
4.0												
- - -												
	undwater (Conditions		<u> </u>	<u> </u>	<u> </u>	<u> </u>	1	<u> </u>			<u> </u>
Stab Good												
	eral Rema erminated o	rks In stiff clay and coarse material										



10030

COI	NTRAC	T Grea	ater Dublin	Drainage S	cheme								OLE NO		
	ORDIN	ATES _EVEL (m	AOD)		BO		.e diami .e dept		nm)	Dando 20 200 7.20	00		OMME	Sheet 1 of 1 NCED 18/02/2013 ETED 18/02/2013	
	ent Sineer	-	al County (Council	SPT	r hami	MER REI RATIO (%	F. NO.		SPT6 55		BORED	BY SSED B	WC BY JL	
								-/				nples			
Depth (m)			Des	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe
0	Soft lig mediu	ght brown : m cobble o	sandy grav content	elly silty CL	AY with a low	to		· · · ·		AN3735	в	1.00-1.4	15	N = 7 (1, 1, 2, 2, 2, 1)	
2	Stiff da	ark brown	sandy grav	elly CLAY					2.60	AN3736	В	2.00-2.4	15	N = 8 (1, 2, 2, 1, 2, 3)	
3	Stiff bl				′ with a mediur	n č			3.20	AN3737	В	3.00-3.4	15	N = 26 (3, 4, 6, 6, 7, 7)	
4										AN3738	В	4.00-4.4	15	N = 32 (5, 6, 7, 7, 8, 10)	
5						- ¥ ¥				AN3739	В	5.00-5.4	15	N = 50/285 mm (7, 9, 11, 12, 14, 13)	
6	Very s	tiff dark br	own sandy	me grey gravelly Cl					6.30 6.70	AN3740	в	6.50-6.9	95	N = 50/105 mm (21, 4, 36, 14)	
-7_ -8 -9 -10		m boulder							7.20	_					
			Time				Wate	r Ca	asing	Sealed	Rise	e l 7	Time	VATER STRIKE DET	AILS
4.	n (m) 75 .4 7	To (m) 4.85 6.6 7.2	(h) C 0.5 0.75 1.5	omments			Strike		epth	At	To		min)	Comments No water strike	
									I				GF	ROUNDWATER PRO	GRES
	TALLA Date	TION DET	AILS	RZ Base	Туре		Date	e	Hole Depth	Casing Depth	De W	pth to /ater	Comme	ents	
REN	MARKS								D - Small B - Bulk I	le Legenc Disturbed (tub) Disturbed e Bulk Disturbed			P - L	Undisturbed 100mm Diameter Samp Undisturbed Piston Sample Water Sample	le



10030

1	-	5																
-	NTRAC		eater Dub	lin Dr	ainage S	Scheme							:	BOREH SHEET	OLE N	0.	BH11 Sheet 1 of 1	
	-ordin Ound L	ATES _EVEL (r	n AOD)					PE OLE DIAM OLE DEPT		(mn	1) 2	Dando 20 200 1.80		DATE C DATE C			ED19/02/2013ED19/02/2013	
1	IENT GINEER		gal Coun	ty Co	uncil		-	MMER RE				SPT6 55		BORED PROCES		BY	WC JL	
													Sam	nples				0
Depth (m)			D	escri	otion			Legend	i i	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recoverv		Field Test Results	Standpipe Details
- 0	Soft da	ark browi	n sandy g	ıravell	y CLAY			- <u></u>	3 		0.90							
	Soft to	firm ligh	t brown s	andy	gravelly	CLAY					0.00	AM2742	В	1.00-1.4	5		N = 7 (1, 2, 2, 2, 2, 1)	
2											2.80	AM2743	В	2.00-2.4	5		N = 8 (2, 2, 2, 2, 2, 2, 2)	
3	Soft to CLAY	firm ligh	t brown a	ind gr	ey sand	y gravelly	silty					AM2744	В	3.00-3.4	5		N = 2 (2, 1, 0, 0, 1, 1)	
4											4.80	AM2745	В	4.00-4.4	5		N = 50/180 mm (13, 12, 16, 19, 15)	
5																		
			DRING/C Time					Wate	er (Casir	na	Sealed	Rise	е т	ime		TER STRIKE DET	AILS
-		To (m)	(h)	Con	nments			Strike	e i	Dept	th	At	То		nin)	Co	omments	
4	1.4	4.8	1.5														lo water strike	
L											olc	Cooler	-	a 4 la 4 -	G	RO	UNDWATER PRO	GRESS
INS	TALLA Date	TION DE	TAILS	op F	RZ Base	Ту	pe	Dat	e		ole epth	Casing Depth	Dej W	pth to ater	Comm	ent	S	
REI	MARKS										B - Bulk Di LB - Large	Bulk Disturbed	i		P -	Undis	sturbed 100mm Diameter Samp sturbed Piston Sample er Sample	le
:											Env - Envi	ronmental Sam	ple (Jar + \	/ial + Tub)				



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L	0095

	-	5																
	NTRAC		eater Dub	olin Dr	ainage S	cheme							;	BOREH SHEET		0.	BH12 Sheet 1 of 1	
	-ordin Ound I	ATES _EVEL (r	n AOD)					'E DLE DIAM DLE DEPT		mm)	Dando 200 4.70	0 2000		DATE C DATE C			ED 21/02/2013 ED 21/02/2013	
	ent Gineer		gal Cour	nty Co	uncil			MMER RE			SPT6 55		1	BORED		BY	WC JL	
Ē														ples				Θ
Depth (m)			C	Descriț	otion			Legend		Depth (m)	Ref.	Number	Туре	Depth (m)	Recoverv	6.00000	Field Test Results	Standpipe Details
0	Soft b CLAY	ecoming with a m	firm light edium co	reddi: bble d	sh brown content	sandy gra	avelly				AN3	748	В	1.00-1.4			N = 8 (1, 2, 2, 2, 2, 2)	
2									 		AN3	749	В	2.00-2.4	5		N = 10 (2, 2, 2, 3, 3, 2)	
3									- - 		AN3	750	В	3.00-3.4	5		N = 14 (2, 3, 3, 4, 3, 4)	
4										4.70	AN3	751	В	4.00-4.4	5		N = 50/225 mm (7, 8, 11, 14, 16, 9)	
5	End o	f Borehol	e at 4.70	m														
6																		
7																		
- 8																		
9																		
- 10																		
НА	RD ST	RATA BO	ORING/C	HISE	LLING			-	I					I		NA	TER STRIKE DET	AILS
		To (m)	Time (h)		nments			Wate Strike		asing Depth	Seale At	d	Rise To		īme min)		omments	
4	.3	4.7	1.2													N	lo water strike	
									I					I	G	RO	UNDWATER PRO	GRESS
	TALLA Date	TION DE	TAILS	op F	RZ Base	Тур)e	Dat	e	Hole Depth	Cas De		Dep W	oth to ater	Comm			
REI	MARKS									San	nple Leg	pend				Undia	turbed 100mm Diameter Samp	e
										B - Bu LB - Li	hall Disturbed Ik Disturbed arge Bulk Dis Environmenta	turbed	(Jar + V	/ial + Tub)	P -	Undis	turbed Tourinn Diameter Samp turbed Piston Sample er Sample	~



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

Q	33	a./														1	005	5
COI	NTR/	АСТ	G	reate	er Dublin [Drainage	Sche	eme						LHOLE	NO	RC		
00-	ORD	DINA ⁻	TES										SHE	et E drill	FD		et 1 of 3/2013	
GRO		D LE	VFI	(mO	וח				RIG TYPE			Knebel		E LOGG			3/2013	
	ENT			•	County C	ouncil			FLUSH	ON (deg)		Air/Mist -90	DRIL	LED B	Y	Pe	eterser	ì
ENG	SINE	ER			1				CORE DIA		m)	82	LOG	GED B	Y	JL	-	1
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lo	cing og	Non-intact Zone	Legend			Descript	ion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
	ů				0 250) 500 	Ň	Le	O a s a d alam						De	Ш	Sta	S S
0									Cased dov	vn Shell & /	Auger Hole							
1 2 3 4 5	6.30	100	0	0					SYMMETF returns of 1 limestone I Strong gre very stiff ye SYMMETF	Shell & Aug RIX DRILLII brown sand boulders y calcisiltite ellow browr	NG: No reco ly gravelly C limestone l to brown s	overy, obser CLAY with o BOULDER andy gravel	ved by dril ccasional with some ly CLAY	ler as stiff to	3.80 4.80 5.30 6.30			
7 8 9									limestone	boulders	ly gravelly C NG: No reco ly Boulder C	overv. obser		ler as	7.80			N = 50/2 mm (9, 12, 16, 16, 7) N = 45 (7, 9, 10, 14, 11)
									-									
	IAR				1			<u> </u>		Mater	Castar	Coolert	Dia	T '	WA	TER ST	TRIKE	DETAILS
-IOle	e cas	sed 0	.00-1	3.40r	Π					Water Strike 15.60	Casing Depth	Sealed At	Rise To	Time (min)		mmeni		
Ne	T	LATI		ET V						Date	Hole	Casing	Depth to Water		GRO		NATE	R DETAIL
	Date				RZ Top	RZ Base	e	Тур	De	Dale	Depth	Depth	Water			0		



REPORT NUMBER

Bit TYPE Knebel Date DATE LogGED OUN320/13 DATE DATE Fingal County Council NUMETRY (mm) 62 Difference NONKER CORE DIAMETER (mm) 62 Difference 000320/13 Image: State of the state	193	1														000	0
CO-ORDINATES FIG TYPE Knebel Arithest FLUSH Knebel Arithest FLUSH Knebel Arithest FLUSH Knebel Arithest FLUSH Date DRILLED Are DOGED Date DRILLED Are DOGED On Add 32013 USENT Regination of the state (a) and a state (b) and b) and b) (b) and b) and b) (c) and b)	ONTR	АСТ	G	reate	r Dublin Drainage	Sche	me							NO	-		0
ROUND LEVEL (mOD) PRIG TYPE Knebel DATE LOGGED 04/03/2013 LIENT Fingal County Council NCLINATION (deg) -90 DRILLED BY Petersen LIENT Fingal County Council NCLINATION (deg) -90 Description 01 04/03/2013 ILENT Fingal County Council Southing 0	O-ORE	DINA	TES											ED			
NONNEER CORE DIAMETER (mm) 82 LOGGED BY JL Image: State of the	ROUN	D LE	VEL	(mOl	D)							DATE	ELOGG	ED			
0 Image: Constraint of the second		ER	Fi	ngal	County Council					m)							1
0 SSE2 SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sandy Boulder CLAY (continued) 12.10 1 SYMMETRIX DRILLING: No recovery, observed by driller as returns of greyish brown LIMESTONE with some calcile veinfit 13.40 1 Strong massively bedded light grey and brown calcisititie LIMESTONE with some calcile veinfit 13.40 1 Strong massively bedded light grey and brown calcisititie LIMESTONE with some calcile veinfit 13.40 1 UBESTONE with significant brecastion coupled with penetrative brown discloution and honeycomb dissolution to medium strong occasionally with work free and no fracture surfaces. SET 2: Subvertical widely spaced rough undulating, open with yellow clay smearing on fracture surfaces. SET 2: Subvertical widely spaced rough undulating, open dried with upelw clay smearing on fracture surfaces. SET 2: Subvertical widely spaced rough undulating, open dried us strong proved is social with breaked light grey green fine grained argilicacous LIMESTONE with localised by to to simple or weak at fracture surfaces. SET 2: Subvertical widely spaced rough undulating, open dried usor social with breaked light grey green fine grained argilicacous LIMESTONE with localised by to to simple or border displaying green strature surfaces. Set 2: Subvertical widely spaced rough undulating, open dried usor weak at fracture surfaces. Fracture surfaces. Fracture set often associated with no infact argumets to subrounded first to subrounded first to medium spaced rough undulating, open dried usor social weak is social to subrounded the social condent to subrounded first to subrounded first to subrounded first to medium spaced rough undulating, open dried usor social social with light grey gree	Core Run Depth (m)	T.C.R.%	S.C.R.%	Υ.	Spacing Log (mm)	Non-intact Zone	Legend			Descript	ion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
3 100 90 52 13.40 14.40 100 90 52 13.40 14.40 100 96 41 14.40 14.40 100 96 41 14.40 15.40 16.10 100 96 41 16.10 16.10 16.10 100 96 41 16.10 16.10 16.10 100 96 41 16.10 16.10 16.10 100 96 41 16.10 16.10 16.10 100 96 41 16.10 16.10 16.10 100 92 44 16.10 16.10 16.10 100 92 44 16.10 16.10 16.10 100 92 44 16.10 16.10 16.10 100 92 44 16.10 16.10 16.10 100 92 44 16.10 16.10 17.00 16.10 100 88 31 16.10 17.00 10.00 10.0	1							symmetri	brown sand	ly Boulder C	LAÝ (contin	ved)	er as	12.10			N = 50/9 mm (25, 38, 1 N = 50/11 mm (6, 11, 17, 12)
100 96 41 Discontinuities 13.40-16.10m SET 1: 0-10° closely to medium spaced rough undulating occasionally smooth partly open, occasionally with brown fine sand on fracture surfaces. SET 2: Subvertical widely spaced rough undulating, open with yellow clay smearing on fracture surfaces 100 92 44 Medium strong medium bedded light grey green fine grained argillaceous LIMESTONE with localised breciation often loosely cemented. Weathering: Occasional loss of wall strength to weak at fractures. Penetrative (up to 5mm) orange brown discolouration noted on subvertical fracture surfaces 100 88 31 Discontinuities 16.10-19.30m SET 1: 0-10° closely spaced rough undulating ight to partly open, clean. SET 2: 60-80° closely to medium spaced rough undulating, open often displaying orange brown discolouration noted on subvertical fracture surfaces. 100 88 31 Discontinuities 16.10-19.30m SET 1: 0-10° closely spaced rough undulating open often displaying orange brown discolouration, occasionally with light frey green sandy CLAY veneer on surfaces. Fracture surfaces 100 100 95 Discontinuities 16.50m 10mm thick subvertical to undulating calcite uvein 19.30 100 100 95 End of Borehole at 19.30 m 19.30 End of Borehole at 19.30 m Medium strong Sealed Rise Time Comments	4	100	90	52				veinfill Strong ma LIMESTOI penetrative features / Slight loss	ssively bed NE with sig brown dis pitting of cc of core stre	ded light gre nificant brec colouration a re walls (up ength in area	ey and brown ciation coup and honeycc to 20mm). \ as displaying	n calcisiltit led with omb dissol Weatherin	e ution g:	13.40			
100 92 44 16.10 17.00 Medium strong medium bedded light grey green fine grained argillaceous LIMESTONE with localised brecciation often loosely cemented. Weathering: Occasional loss of wall strength to weak at fractures. Penetrative (up to Smm) orange brown discolouration noted on subvertical fracture surfaces 100 88 31 Discontinuities 16.10-19.30m SET 1: 0-10° closely spaced rough undulating tight to partly open, clean. SET 2: 60-80° closely to medium spaced rough undulating, open often displaying orange brown discolouration, occasionally with light grey green sandy CLAY veneer on surfaces. Fracture set often associated with non intact angular to subrounded fine to medium gravel-sized fragments of light grey green limestone. 19.30 19.30 100 95 18.35-18.50m 10mm thick subvertical to undulating calcite vein 19.30 10.20 100 95 19.30 Matter Strike DetAll Time (min) Comments		100	96	41	F			Discontinu medium sp open, occa SET 2: Su	ities 13.40- baced rough asionally wi bvertical wi	16.10m SE n undulating th brown find dely spaced	T 1: 0-10° cl occasionally e sand on fra rough undu	y smooth acture sur lating, ope	faces.				
100 88 31 Image: Surfaces Discontinuities 16.10-19.30m SET 1: 0-10° closely spaced rough undulating tight to partly open, clean. SET 2: 60-80° closely to medium spaced rough undulating, open often displaying orange brown discolouration, occasionally with light grey green sandy CLAY veneer on surfaces. Fracture set often associated with non intact angular to subrounded fine to medium gravel-sized fragments of light grey green limestone. 100 100 95 100 100 95 19.30 19.30 100 95 Image: Subscript of the associated with non intact angular to subrounded fine to medium gravel-sized fragments of light grey green limestone. 18.35-18.50m 10mm thick subvertical to undulating calcite vein 19.30 Image: Subscript of the cased 0.00-13.40m Water Casing Sealed Rise Time (min) Comments	17.00	100	92	44		 X := \		Medium st argillaceou loosely cer strength to	rong mediu is LIMESTO mented. We weak at fra	m bedded li DNE with loc eathering: O actures. Per	ght grey gre calised brecc ccasional los netrative (up	en fine gra ciation ofte ss of wall to 5mm)	en	16.10			
100 100 95 Image: the fine to medium gravel-sized fragments of light grey green limestone. 19.30 100 95 Image: the fine to medium gravel-sized fragments of light grey green limestone. 19.30 18.35-18.50m 10mm thick subvertical to undulating calcite vein Emarks End of Borehole at 19.30 m Emarks Water Casing Sealed Rise Time Strike Depth At To (min) Comments	3		88	31	Ē	A a A		Surfaces Discontinu rough undi closely to r displaying light grey g	ities 16.10- ulating tight medium spa orange bro green sand	19.30m SE to partly op aced rough (wn discolou / CLAY vend	Γ 1: 0-10° cl en, clean. S undulating, c ration, occas eer on surfac	osely spa ET 2: 60-8 open often sionally wit ces. Fract	ced 30° th ure				
ble cased 0.00-13.40m Water Casing Sealed Rise Time Comments Strike Depth At To (min) Comments	9 19.30		100	95		-/		fine to med limestone. 18.35-18.5 vein	dium gravel 50m 10mm	-sized fragm thick subve	nents of light	grey gree	en	<u>19.30</u>			
Strike Depth At To (min) Comments	EMAR	KS												WAT	TER ST	RIKE	DETAILS
	ole cas	ed 0	.00-1	3.40r	n				Strike								
GROUNDWATER DETAILS										Holo	Casing	Donth t		GRO	DUND	VATER	
STALLATION DETAILS Date Hole Depth Casing Depth to Depth Depth to Water Comments Date Tip Depth RZ Top RZ Base Type Image: Comments Image: Comments Image: Comments						e	Ту	De	Date			Water	' Com	nments	6		



REPORT NUMBER

0.0331	/												1	669	95
CONTRACT	r Gre	eater	⁻ Dublin Drainag	e Sch	eme					DRII SHE		NO	RC Shee	12 et 1 of	f3
CO-ORDINA GROUND L		nΟΓ	n			RIG TYPE			Knebel	DAT	E DRILLE E LOGGE		04/0	3/201	3
CLIENT ENGINEER			County Council			FLUSH INCLINATIO		m)	Air/Mist -90 82		LLED BY		Pe	eterse	en .
 Downhole Depth (m) Core Run Depth (m) T.C.R.% 	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm)) ²⁵⁰ 56	Non-intact Zone	Legend			Descript				Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0 1 1 2 3 3 4 5 6 7 6 7 8 9 REMARKS						Vreturns of E	Brown TOF RIX DRILLII	NG: No recc SOIL NG: No recc by gravelly B	very, obse	rved by dri	/	0.20			N = 44 (9, 12, 15, 8, 11) N = 50/20 (6, 9, 14, 1 18) N = 50/17 m(4, 10, 12, E DETAILS
Hole cased	0.00m-2	20.50)m				Water Strike 14.80	Casing Depth	Sealed At	Rise To	Time (min)		immen		
								Hole	Casing	Denth t	0 -			NATE	R DETAIL
Date 08-03-13	Tip Dep 16.50	oth	LS RZ Top RZ Ba 10.50 16.50		Ту 50mn		Date	Depth	Depth	Depth t Water	Com	ment	5		



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

20	33	20														009	0
CON	ITR/	АСТ	G	Greate	er Dublin E	Drainage	Sche	me				DRIL		NO	RC	12 et 2 of 3	2
CO-	ORE	DINA	TES											ED		3/2013	
GRC	DUN	D LE	VEL	(mO	D)				RIG TYPE FLUSH		Knebel Air/Mist	DATE	LOGG	ED		3/2013	
CLIE			F	ingal	County C	Council		1	INCLINATION (deg		-90 82		LED BY GED BY		P	etersen	
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lo (mi 0 ²⁵⁰	cing og m)	Non-intact Zone	Legend		Descri	ption			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								Ż	SYMMETRIX DRI returns of greyish					10.10 10.90			9)
11									SYMMETRIX DRI returns of Brown s	LLING: No re andy CLAY	covery, obse	rved by drill	er as	10.90		0 0 0 0 0 0	N = 38 (6, 6, 8, 9 12)
12																	N = 50/6 mm
13									SYMMETRIX DRI returns of Soft dar fragments (Possib	k brown sand	y CLAY with	rved by drill some limes	er as stone	13.20		0 0 0 0 0 0	(25, 50
14																	N = 2 (2, 4, 5, 6 5)
15																0 0 0	N = 22 (3, 4, 4, 7 6)
16																。 。 。	6)
17																	N = 38 (6, 13, 16 7, 7)
18																	N = 25 (4, 6, 6, 4
19																	(4, 6, 6, 4 8)
REN	IAR	ĸs												WAT	TER S	EXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	DETAILS
lole	cas	sed 0	.00m	-20.5	0m				Wate Strik 14.8	e Depth	Sealed At	Rise To	Time (min)	Co	mmen	ts	
														GRO		NATER	
				DETA					Dat	e Hole Depti		Depth to Water	Corr	nments	3		
Γ	Date 03-1		Tip D 16.5		RZ Top 10.50	RZ Base 16.50	Э	Ту 50mn									



GEOTECHNICAL CORE LOG RECORD

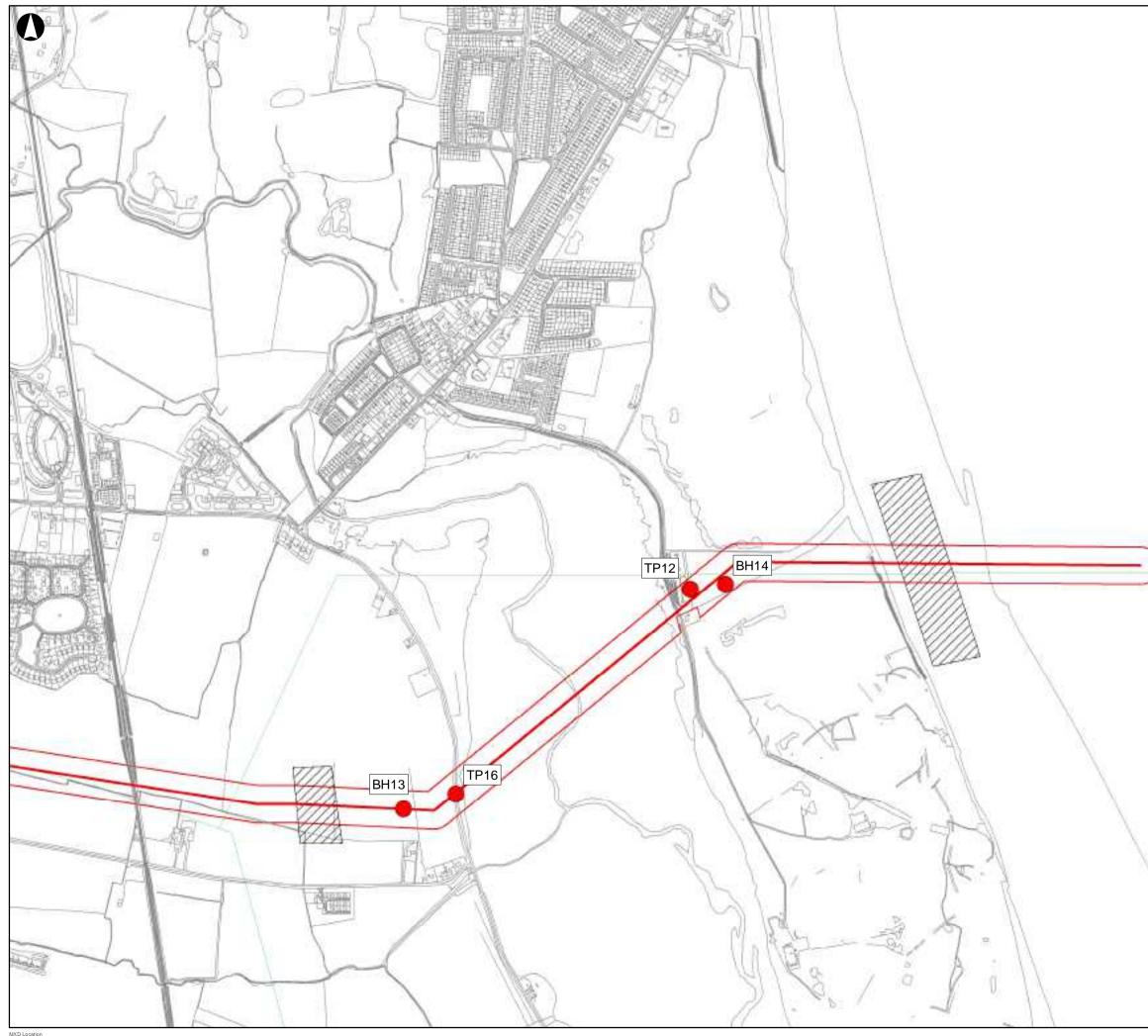
1	6695	
	0000	

Q	93	a./														1	669	5
COI	NTR/	АСТ	G	Freate	er Dublin D	Drainage	Sche	me					DRIL SHE	LHOLE ET	NO	RC Shee	12 et 3 of 3	3
		DINA							RIG TYPE			Knebel	DAT			04/0	3/2013	
	DUN ENT			(mO	D) County C	ouncil			FLUSH	ON (dea)		Air/Mist -90		E LOGGE			3/2013 etersen	
	SINE			T					CORE DIA		m)	82		GED BY		JL		
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac Lo (mr 0 ²⁵⁰	cing 9g m)	Non-intact Zone	Legend			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20															20 50			
21	21.50	0	0	0	-				recovered gravel-size	as angular ed fragment iities 20.50	greyish brow to subangu s. (Poor Re -24.80m Dif	lar medium covery)	to coarse		<u>20.50</u>			
22		6	0	0														
23	23.20				-													
24		13	0	0														
ſ	24.80				-				End o	of Borehole	at 23.20 m				24.80			
25																		
26																		
27																		
28																		
29																		
	AR e cas		.00m	-20.5	i0m					Water Strike 14.80	Casing Depth	Sealed At	Rise To	Time (min)		ren S ⁻		DETAILS
											Hole	Casing	Donth to				NATEF	R DETAIL
	TALI Date			DETA epth	ILS RZ Top	RZ Base	e	Ту	De	Date	Depth	Depth	Depth to Water	Com	ments	6		
	03-1		16.5		10.50	16.50		50mn		1								

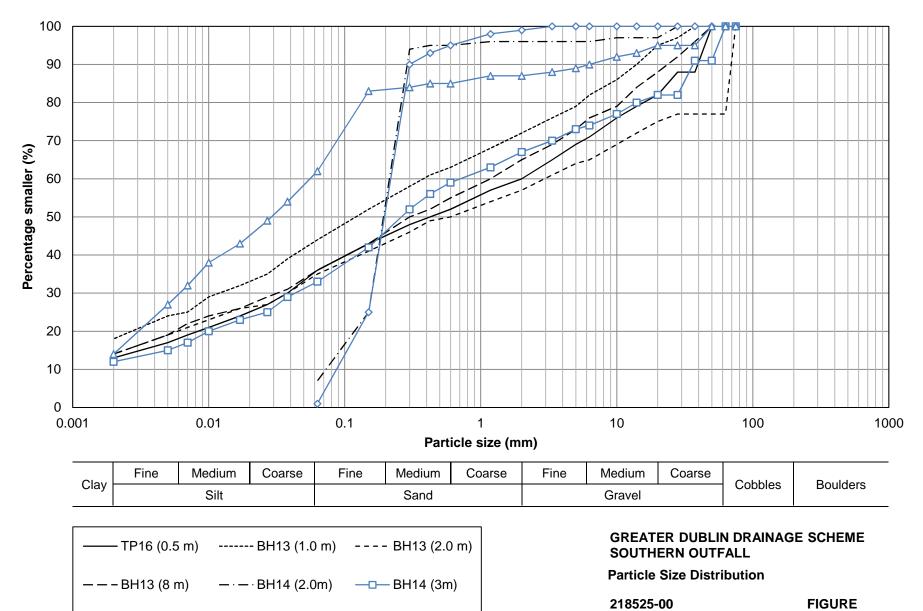
Appendix E

Southern Outfall - Site Plan, Graphs and Logs



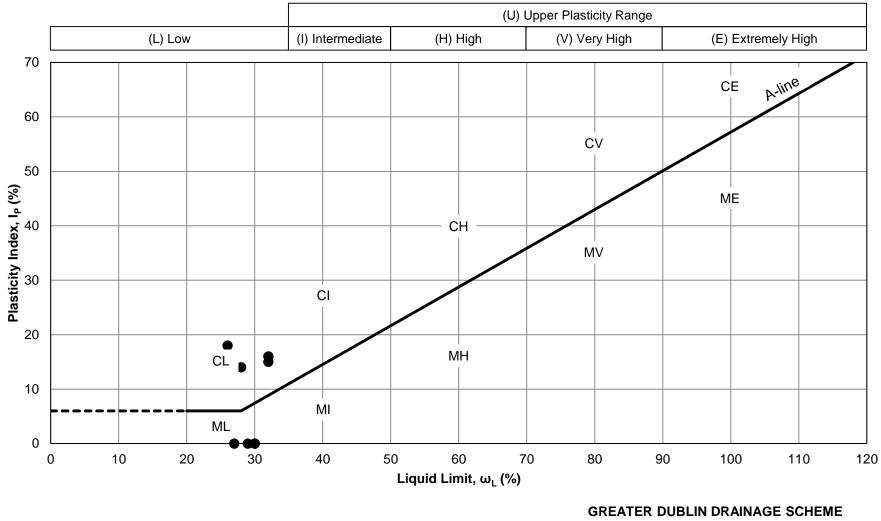


	- Am			
		oPhysic		
	Ordnance Survey © Ordnance Survey P1 12-04-12 Issue Date	Ireland Lic ey Ireland/ DF By Metres 275	ense No. E Governmer BA Chkd	N 0002812 ht of Ireland SM Appd 550
	S0 Ringsend Roa Dublin 4 Tel +353 (0)1 233 www.arup.com Client Fingal County	d 3 4455 Fax Council		
8	Location Southern Scale at A3 1:10 Job No 218525-00 Drawing No G-005		JS	Issue P1



→ BH14 (5.0 m) → BH14 (8.0 m)

E.1



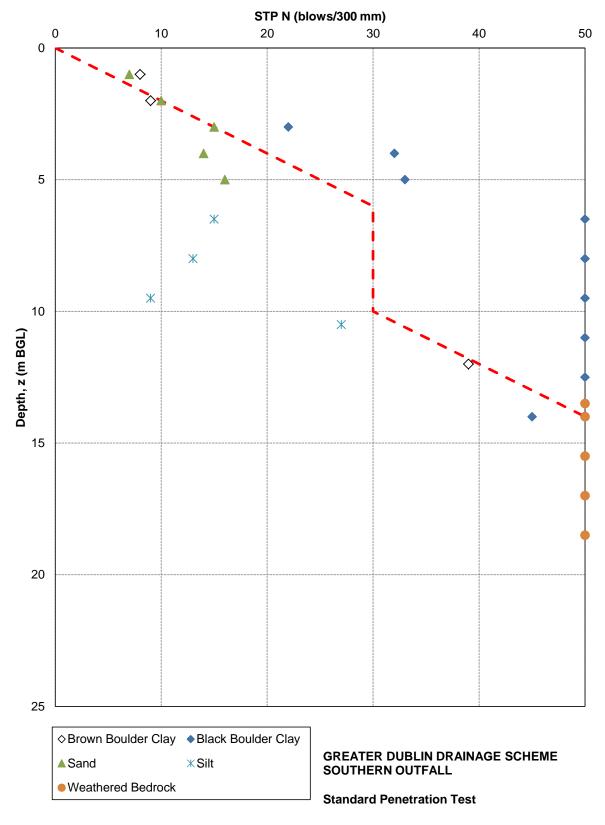
SOUTHERN OUTFALL

Atterberg Limits

FIGURE

E.2

218525-00



218525-00

FIGURE E.3

16	695	
D 23/0	1/2013	
		0-3a
es		ieter
Ę	e Test (KPa	Hand Penetrometer (KPa)
Depi	Van	(KPå
0.50-0.60		
1.50-1.60)	
2.80-3.10)	
-	D 23/0 ETED 23/0 ETED 23/0 85 0.50-0.60 1.50-1.60	TP16 Sheet 1 of 1 D 23/01/2013 TED 23/01/2013 Kubota KX08

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(3)	
08	33.

TRIAL PIT RECORD

100	934									595	
CON	ITRACT Greater Dublin Drainage Scheme						TRIAL P	IT NO.	TP1 Sheet	7 t 1 of 1	
_OG(GED BY JL	CO-ORDINAT	ËS				DATE ST			/2013	
CLIEI		GROUND LE	VEL (m)				DATE CO	-	TED 07/03/2013 Hitachi Zaxis 80S		
	INT Fingal County Council						METHO				
								Samples	;	a)	neter
	Geotechnical Description					ike				t (KP	letron
			Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Type	Depth	Vane Test (KPa)	Hand Penetrometer
0.0	TOPSOIL: Soft brown slightly sandy CLAY with rootlets. Sand is fine to medium.	n frequent	<u></u> <u></u>							-	
	Soft occasionally firm yellow brown and grey sl silty CLAY with frequent roots and rootlets. Sar medium.			0.30			AA0217	В	0.40-0.60		
1.0	Firm grey brown occasionally mottled yellow or gravelly CLAY. Sand is fine to medium. Gravel subrounded fine to medium of limestone.	ange sandy is angular to		0.90			AA0218	В	1.00-1.20		
-	Firm occasionally stiff brown slightly sandy gra with a low to medium cobble content. Sand is f	velly CLAY		1.55							
2.0	medium. Gravel is subangular to subrounded fi of limestone. Cobbles are subrounded of limes	ne to coarse				(Seepage)	AA0219	LB	1.90-2.00		
-	Very stiff dark grey brown slightly sandy gravell a medium cobble content. Sand is fine to medii subangular to subrounded fine to coarse of lime Cobbles are subrounded of limestone.	um. Gravel is		2.30			AA0220	В	2.35-2.40		
3.0	2.80m - Occasional subrounded boulder of lime 350mm) End of Trial Pit at 3.00m	estone (up to		3.00							
4.0											
	Indwater Conditions										
0	t seepage from 1.90m										
Stabi Good											
	eral Remarks rminated on very stiff clay										



1	6695
	0030

	-	5														
CO	NTRAC	T Gre	ater Dublin	Drainage	Scheme	1						Boref Sheet	IOLE N	0.	BH13 Sheet 1 of 2	
	ORDIN	IATES LEVEL (n	n AOD)				'E OLE DIAMI OLE DEPT	•	nm)	Dando 20 200 13.00					ED 30/01/2013	
	ENT SINEER		gal County	Council		-	MMER REF (RATIO (%			SPT6 55		BORED PROCE) BY SSED	BY	WC JL	
						1					San	nples				0
Depth (m)			Des	scription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	Recovery		Field Test Results	Standpipe Details
- 1	Soft to mediu	o firm darl m cobble	k brown san content	ndy silty CL	AY with a	low to		· · · ·		AN3072	в	1.00-1.	45		N = 8 (1, 2, 2, 3, 1, 2)	
2	Very s	stiff to har	d black sar	dy gravelly	silty CLA	Y with a	8661 - 1 × 1 × 1 × 1		2.70		В	2.00-2.			N = 9 (2, 2, 2, 3, 2, 2)	
- 3	mediu	m cobble	and a low	to medium	boulder co	ontent				AN3074 AN3075	В	3.00-3. 4.00-4.			N = 22 (3, 4, 4, 5, 6, 7) $N = 32$ (6, 7, 7, 8, 8, 0)	
- 5										AN3076	в	5.00-5.	45		(6, 7, 7, 8, 8, 9) N = 33 (4, 6, 6, 8, 10, 9)	
6										AN3077	В	6.50-6.	95		N = 50/265 mm (7, 8, 11, 12, 14, 13)	
8										AN3078	В	8.00-8.	45		N = 50/95 mm (25, 36, 14)	
- 10										AN3079	В	9.50-9.	95		N = 50/225 mm (9, 11, 14, 17, 17, 2)	
HA	RD ST	RATA BO	RING/CHI	SELLING					·					WA	TER STRIKE DET	AILS
Fror	n (m)	To (m)	Time (h)	Comments			Wate Strike		asing epth	Sealed At	Rise To		Time (min)	Co	omments	
7	4 .9 9 2.7	4.2 8.3 9.2 13	0.75 1 0.75 2											N	lo water strike	
									Hole	Casia			G	RO	UNDWATER PRO	GRESS
	TALLA Date	TION DE		RZ Base	Ту	pe	Date	e	Hole Depth	Casing Depth	De W	pth to ater	Comm	nents	S	
REI	MARKS	;							B - Bulk LB - Lar	ple Legeno Ill Disturbed (tub) Disturbed ge Bulk Disturbed vironmental Sam	ł	(in) , T	P -	Undist	turbed 100mm Diameter Samp turbed Piston Sample r Sample	le



	\sim	\sim	0	-
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- 1	U	U	\mathbf{J}	\mathbf{J}

1	-	5													
со	NTRAC	T Grea	ater Dublin	Drainage S	Scheme							BOREHO SHEET	DLE NO	D. BH13 Sheet 2 of 2	
	-ordin Ound I	ATES LEVEL (m	AOD)				e Dle Diame Dle Depti		nm) 2	Dando 20 200 13.00	00			NCED 30/01/2013	
	ENT GINEER		al County (Council			MMER REF 7 RATIO (%			SPT6 55		BORED PROCES		WC BY JL	
								9				nples			
Depth (m)			Des	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
11 12 13 14 15 16 17 16 17 18 19 20 21	mediu (conti	m cobble nued)	I black san and a low t	o medium t	silty CLAY boulder cor	with a ntent			13.00	AN3080	В	11.00-11.4		N = 50/225 mm (7, 9, 11, 12, 19, 8) N = 50/210 mm (12, 13, 16, 18, 16)	
НА	ARD ST	RATA BO	RING/CHIS	SELLING									v		
		To (m)	Time	omments			Wate		0	Sealed	Ris		ime	Comments	
<u> </u>	4 7.9 9 2.7	4.2 8.3 9.2 13	(h) 0.75 1 0.75 2				Strike	<u>- D</u>	epth	At	<u> </u>	, (n	nin)	No water strike	
2							-		Hole	Casing	De	pth to		ROUNDWATER PRO	GKESS
INS	Date	TION DE	TAILS th RZ Top	RZ Base	Тур	00	Date	e	Depth	Depth	W	/ater	Comme	ents	
	MARKS	;							LB - Bulk L	le Legence Disturbed (tub) listurbed e Bulk Disturbece ironmental Sam	ł	Vial + Tub)	P-L	Jndisturbed 100mm Diameter Sam Jndisturbed Piston Sample Water Sample	ple



16695

00	NTRAC	Gree		Drainage S								Boreh Sheet			BH14 Sheet 1 of 1	
	-ordin Ound I	IATES LEVEL (m	n AOD)			rig type Borehol Borehol	E DIAME	•	nm)	Dando 20 200 10.50		DATE C DATE C			23/01/2013 24/01/2013	
	ENT GINEER		gal County	Council		SPT HAMI ENERGY F				SPT6 55		BORED		DV	WC CB	
										55		nples	55LD I		00	
Depth (m)			Des	scription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	·	Recovery		Field Test Results	Standpipe Details
0		-	wn SAND.			- - - - - -			1.20	AN3061	в	1.00-1.4	.5	-	N = 7 (1, 1, 2, 2, 1, 2)	
2	shell r	naterial.	-	ale brown, s			. [.] .× . [.] .		2.50	AN3062	в	2.00-2.4	5		N = 10 (2, 2, 2, 2, 3, 3)	
3	Mediu materi		pale brow	n, silty SANI	D, with shel					AN3063	в	3.00-3.4	.5		N = 15 (2, 2, 3, 3, 4, 5)	
4						> > >				AN3064	в	4.00-4.4	5		N = 14 (2, 2, 3, 3, 4, 4)	
5	Stiff, d	lark grey,	sandy SIL	Γ with shell	material.	× × × ×	· · × · · · · · · · · · · · · · · · · ·		5.10	AN3065	В	5.00-5.4	5		N = 16 (1, 3, 3, 4, 4, 5)	
7		m dense,		th shell mat sandy GRA		hell	$\begin{array}{c} \times \cdot & \times \\ \cdot & \times \\ \times \cdot & \times \\ \cdot & \times \\ \cdot & \times \\ \cdot & \cdot \\ \cdot & \cdot \\ \partial_{X} \circ & \partial_{X} \circ \\ \hline \cdot & \cdot \\ \cdot & \\ \cdot & \cdot \\$		7.00 7.30 7.60	AN3066	В	6.50-6.9	5		N = 15 (3, 4, 4, 3, 4, 4)	
8	Stiff, c	lark browi	n, sandy Sl	LT, with she	ell material.	×	· · · × · · × · · · · · · × · · · × · · · × · · · × · · × · · ×			AN3067	в	8.00-8.4	5		N = 13 (2, 2, 3, 3, 4, 3)	
10			sandy SIL				×· × · × × · × × · × · ×		9.90 10.50	AN3068	в	9.50-9.9	5		N = 9 (2, 2, 2, 2, 3, 2)	
-	End o	f Borehole	e at 10.50 r		conditions.											
			Time				Water	C 2	sing	Sealed	Ris		ime		R STRIKE DET	AILS
		To (m)	(h) C	Comments			Strike	De	epth	At	То	(1	min)		ments	
1	7.3 10 1.7	7.5 10.1 12	0.75 0.5 0.75				2.20 9.20		.20 .20	7.30	1.9 4.3		20 20	5	Slow Slow	
-									Hala	Cooing		- 41- 4 -	G	ROUI	NDWATER PRO	GRESS
	TALLA Date	TION DE	TAILS th RZ Top	RZ Base	Тур	e	Date 24-01-13		Hole Depth 10.50	Casing Depth 10.50		pth to /ater 2.00	Comm End of E		9	
RE	MARKS	ground l	level - sanc	unstable at beginning vas abando	to collapse.	On Health	& Safety	at	D - Small B - Bulk I LB - Larg	Disturbed (tub) Disturbed e Bulk Disturbed rironmental Sam	ł	(ial + Tub)	P -	Undisturt Undisturt Water Si	ped 100mm Diameter Samj ped Piston Sample ample	ple



10030

CON	NTRA	CT Gr	eater Dub	lin Drainage	Scheme							BOREH SHEET	OLEN	10.	BH14A Sheet 1 of 2	
		NATES LEVEL (m AOD)				e Dle Diame Dle Depth	•	m) 2	Dando 20 200 13.70	00				D 24/01/2013	
	ENT SINEE		ngal Coun	ty Council			MMER REF. ' RATIO (%)			SPT6 55		BORED		BY	WC CB	
		•				LINENGI						nples	JULD		00	
Depth (m)			D	escription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	-		Recovery	Field Test Results	Standpipe Details
0	Loos	e, dark br	own SAN	D.					1.20							
2		e to medi material.	um dense	, pale brown,	silty SAND,	, with				_						
3	Medi shell	um dense material	e, pale bro	wn, silty SAN	ID, with occa	asional			2.50							
4	BOU	LDER		angular to su					5.10							
6	2,		,				× · × · × · × · × · × · × · × · × · × ·		7.00							
7				with shell ma			× · · × · ×		7.30]						
	Medi mate		e, grey, sil	ty, sandy GR	AVEL with s	shell	® ∂xo 0xo x x		7.60	_						
8			vn, sandy	SILT, with sh	nell material.		·× ·× · × ·× ·× ·× · × ·× ·× ·× · × ·× ·× ·× ·× ·		9.90							
10	Stiff,	grey, san	dy SILT, v	with shell ma	terial.		× · × · × × · × · × × · × · × × · × · ×		3.90	AN3069	в	10.50-10	.95		N = 27 (5, 5, 6, 6, 7, 8)	
							× · · × × · × ·									
			ORING/C	HISELLING			Water	Ca	sing	Sealed	Ris	elī	Fime		ER STRIKE DET	AILS
4. 12 13	n (m) .4 2.9 3.4 3.6	To (m) 4.6 13 13.5 13.7	(h) 1.5 0.5 0.75 1	Comments			Strike 2.20 9.20		pth	At	To		min)	Con	nments	
											1		G	ROU	NDWATER PRO	GRES
	TALL Date	ATION DI Tip De	ETAILS	op RZ Base	е Тур	e	Date		Hole Depth	Casing Depth	De W	pth to /ater	Comn	nents		
REN	MARK	silts. C comple	asing reducted in 150	mm diamete uced to 150m 0mm casing. ing, borehole	nm diameter Obstruction	at 9.50m encounte	a. Borehole ered at 13.4		B - Bulk D	le Legence Disturbed (tub) Disturbed e Bulk Disturbece ironmental Sam	i	Vial + Tuh)	P		rbed 100mm Diameter Sam bed Piston Sample Sample	ple



1	6	6	9	5
---	---	---	---	---

CONTRACT Greater Dublin Drainage Sche						:	Boreho Sheet	LE NO.	BH14A Sheet 2 of 2	
CO-ORDINATES GROUND LEVEL (m AOD)		Pe Ole diame Ole depth		1m) 2	0ando 20 200 3.70	00			CED 24/01/2013	
CLIENT Fingal County Council ENGINEER		MMER REF. Y RATIO (%)		S 5	SPT6 5		BORED B		WC CB	
							nples			
Description		Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
¹¹ Stiff, grey, sandy SILT, with shell material.	(continued)	× ·× · ·× ·× × ·× ·								
Very stiff, dark brown, sandy, gravelly CLA	ΑY			11.70	AN3070	В	12.00-12.45	;	N = 39 (5, 7, 9, 10, 10, 10)	
Dense, grey, silty, sandy subangular fine to grained GRAVEL 14 End of Borehole at 13.70 m	o medium			13.40 13.70	AN3071	В	13.50-13.95	5	N = 50/150 mm (22, 5, 37, 13)	
15 16 17 18 19 20 21 HARD STRATA BORING/CHISELLING									TER STRIKE DET	AILS
From (m) To (m) Time Comments		Water Strike		sing S epth	Sealed At	Rise To			omments	
4.4 4.6 1.5 12.9 13 0.5 13.4 13.5 0.75 13.6 13.7 1										
				11-2	0	-		GRC	UNDWATER PRO	GRESS
	There a	Date		Hole Depth	Casing Depth	De W	pth to vater C	ommen	ts	
Date Tip Depth RZ Top RZ Base	Туре									
REMARKS Progressing 200mm diameter casi silts. Casing reduced to 150mm dia completed in 150mm casing. Obst Following chiselling, borehole term	ameter at 9.50r ruction encount	n. Borehole tered at 13.4		B - Bulk Dis LB - Large	e Legend Disturbed (tub) sturbed Bulk Disturbed conmental Samp		/ial + Tub)	P - Und	isturbed 100mm Diameter Samp isturbed Piston Sample ter Sample	le



REPORT NUMBER

19.00	131	1														'	009	5
CONT	TRA	СТ	G	reate	r Dublin E	Drainage	e Sche	eme							NO	RC ²)
:0-0	RDI	NAT	ES										DATE	E I E DRILL	ED		et 1 of 3 2/2013	
ROI	UND	LE\	/EL ((mOI))				RIG TYPE FLUSH			Knebel Air/Mist		E LOGG			2/2013	
LIEN NGII		R	Fi	ngal	County C	ouncil	1	1	INCLINATI		m)	-90 82		LED B			etersen O'Shea	
	Core Kun Deptn (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Frac Spac Lo (mr 0 ²⁵⁰	cing vg m)	Non-intact Zone	Legend			Descript	iion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
'									Cased dov	wn Shell & A	Auger Hole							
2 3 5 6 7 7 8 8									SYMMETI returns of	RIX DRILLII madegroun	NG: No reco	overy, obser g of Shell &	rved by drill Auger Fill	ler as	6.50			
EM/							1	KXXX	1	10/01	Contra	Socia-i	Diag	Tire	WA	TER ST	RIKE	DETAILS
lole	case	ed 0.0	0-24	4.50r	n					Water Strike 15.00	Casing Depth	Sealed At	Rise To	Time (min)	Co	mment Slow	s	
															GRO	עסאטכ		
IST/	ALL	ATIC	DN D	ETA	LS					Date	Hole Depth	Casing Depth	Depth to Water	Corr	nments	5		



REPORT NUMBER

1000	ä1,/															008	0
CONTR	RACT	G	Freate	er Dublin D	Drainage	Sche	me					DRIL SHE	LHOLE	NO	RC ²	13 et 2 of 3	3
CO-OR	DINA	TES											e drill	ED		2/2013	
GROUI	ND LE	VEL	(mOl	D)				RIG TYPE FLUSH			Knebel Air/Mist	DAT	E LOGG	ED	27/0	2/2013	3
		F	ingal	County C	ouncil			INCLINATIO		m)	-90 82		LED BY			etersen O'She	
Downhole Depth (m) Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac Lo (mr 0 250	cing g m)	Non-intact Zone	Legend			Descript	lion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10 11 12 13								SYMMETF returns of r (continued	madegroun	NG: No recc d consisting	overy, obser g of Shell &	ved by dril Auger Fill	ler as	12.50			
14								returns of g	RIX DRILLII grey sandy nd boulders.	NG: No reco very gravell	overy, obser y clay with o	ved by dril	ler as	<u>13.50</u> 14.80			N = 45 (9, 12, 10, 12, 14)
15								returns of o	arev/brown	NG: No reco sandy very - possible h	gravelly cla	v with occa	ler as asional	14.00			N = 21/10
16																	mm (25, 29, 14
17																	N = 50/19 mm (16, 9, 17, 14)
18																	N = 75/10 mm (25, 50)
REMAR			4 50				<u> </u>		\M/otor	Cooina	Soolod	Rise	Time	WA	TER ST	RIKE	DETAILS
Hole ca	ased (.00-2	4.50r	n					Water Strike 15.00	Casing Depth	Sealed At	To	Time (min)	Co	mment Slow	S	
															2012		
NSTA	LLATI)ETA	ILS					Date	Hole	Casing	Depth to Water	D Corr	GRO		VAIE	
		JIL							Date	Depth	Depth	Water		monte	,		
Dat	e	Ti <u>p</u> D	epth	RZ Top	RZ Base)	Тур	De		-							



REPORT NUMBER

0.0	31.	1													I	003	5
CONT	RAC	т	Grea	ter Dublin	Drainage	Sche	eme						LHOLE	NO	RC		
CO-OF	RDIN	ATES	;									SHE				et 3 of 3	
ROU				וחנ				RIG TYPE			Knebel		e drill E logg			2/2013 2/2013	
				I County (Council			FLUSH INCLINATI	ON (deg)		Air/Mist -90	DRIL	LED B	ŕ	Pe	etersen	
NGIN	IEER			1			1	CORE DIA	METER (m	m)	82	LOG	GED B	Y	D.	O'She	а
Downhole Depth (m) Core Run Depth (m)		S.C.R.%	R.Q.D.%	_ L	cture acing og nm)	Non-intact Zone	pue			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
Core				0 25	500 500	Non-	Legend							Dept	Eleva	Stan	SPT
20 21 22 22 23					<u></u>			returns of	RIX DRILLII grey/brown nd boulders d)	sandy very	gravelly cla	y with occa					
								6						23.60			
							H	SYMMETI returns of	RIX DRILLI	NG: No reco ock	overy, obser	ved by dril	ler as				
24														24.50			
25 26.0		00 76	5 21	Ē				grey/pale (sheared), Discontinu irregular. A clay-smea	trong to very greym fine-g fresh to slig lities are me Apertures ar Ired, commo	grained, LIN htly weathe edium to clo e tight to m only modera	IESTONE (I red. sely spacec oderately op tely iron-oxi	locally plas I, rough, ben, locally de stained	stically				
27 27.4	1(00 92	2 32			<u> </u>		sub-vertica	cite-veined (al.	1-8mm thic	ж). Dips are	945° &		27.45			
28								End	of Borehole	at 27.45 m							
EMA			24.5						Water	Casing	Sealed	Rise	Time				DETAILS
	ase	1 U.UU	·24.3(וות					Strike 15.00	Depth	At	To	(min)	Co	mment Slow	ts	
										Hole	Casing	Depth t				VATER	
NSTA Dat				AILS RZ Top	RZ Base	e	Ту	pe	Date 27-02-13	27.45	Depth 24.50	Depth to Water 12.80				10mins a	after end of



REPORT NUMBER

CONTRACT Grouter Dublin Datage Schomo PRILHOLE NO RC14A CO-ORDNATES BROTYPE Koubel Auffett Boot of the schomo GROUND LEVEL (mOD) Prigat Coury Council PRILHOLE NO Control 1 all prices EXAMPLE Fragat Coury Council CORE DIAMETER (mm) 82 EXAMPLE Fragat Coury Council CORE DIAMETER (mm) 82 Example Fragat Coury Council Price (mm) <	03	131	y														I	009	5
CO-ORDINATES RIG TYPE FLUSH Knobel Air/Mathematical Sector	CONT	TRA	СТ	Gr	reate	er Dublin I	Drainage	Sche	me							NO			
ENDURY Figs County Council FUSH Arr/Mst ENDURY Figs County Council CORE DIAMETER (mm) 52 DRULED BY Petersen US Statute Statute Statute Duscription Statute Duscription US Statute Statute Statute Statute Duscription Statute Statute Statute Statute Statute Statute Statute Statute Statute Statute Statute Statute					mO	ח								DAT	E DRILL		27/0	2/2013	
0 SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sand 1 S 2 S 3 S 4 S 5 S 6 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 7 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 8 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 7 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 8 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 8 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 9 SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey sity fine sand 8 Strike 9 Strike 9 Strike 10 Strike 10 Stow 10 Stow		NT					Council			INCLINATI		m)	-90						
0 SYMMETRIX DRILLING: No recovery, observed by driller as returns of brown sand 1	Downhole Depth (m)	Core Kun Deptn (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Spa Lo (m	cing og m)	Non-intact Zone	Legend			Descripti	on			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
Hole cased 0.00-20.20m Water Strike Casing Depth Sealed At Rise To Time (min) Comments 7.30 Image: Sealed Depth Image: Sealed At Image: Sealed At Image: Sealed At Image: Sealed At Slow Strike Depth Image: Sealed At Image:	1 2 3 4 5 6 7 9									SYMMETI	brown sand	I NG: No reco							
INSTALLATION DETAILS Date Hole Depth Casing Depth Depth to Water Comments				00-20).201	m					Strike					Со	mment Slow	is	
	NST		ΔΤΙΟ	יח אנ	FTA	JIS					Date			Depth t				VATEF	
							RZ Base	e	Ту	pe		Depth		Water					



REPORT NUMBER

Ű,	55	1/														'	003	5
	ITR/	АСТ	G	Freate	er Dublin I	Drainage	Sche	eme						LHOLE	NO		14A	
20-	ORD		TES										SHE	ET E DRILL	ED.		et 2 of	
2PC	וארוב		VEI	(mO	וח				RIG TYPE			Knebel		E LOGG			2/2013 2/2013	
					County C	Council			FLUSH	ON (dea)		Air/Mist -90	DRIL	LED B	(P	eterser	
	INE	ER							CORE DIA		im)	82		GED B			O'She	
(E	(E																	
epth	pth	۶.%	%.%	Q.D.%	Frac	ture	one										etails	(e
e De	n De	T.C.R.%	S.C.R.%	R.Q.I	Spa Lo		ct Zo				Descript	tion			Ē	_	e B	Value
Downhole Depth (m)	Core Run Depth (m)	'				m)	Non-intact Zone	Legend							Depth (m)	Elevation	Standpipe Details	SPT (N Value)
Dov	Cor				0 250	⁰ 500	Nor	Leg							Dep	Ele	Stai	LdS
10								× . ×	SYMMET		NG: No reco	overy, obser	ved by dril	ler as				
								× .		grey sity in		nunuea)						
								× .										
11								×										
								× .										
12								· · · · · · · · · · · · · · · · · · ·	SYMMET	RIX DRILLI	NG: No reco	overy, obsei	ved by dril	ler as	12.00			
									returns of	grey clay			,					
									-									
13									-									
								5	SYMMET	RIX DRILLI	NG: No reco	overy, obsei	ved by dril	ler as	13.50			
									returns of I	brown sand	dy very grav	elly clay with	n occasion	al				
14											•	0,						N = 50/11 mm (8, 17, 29, 2
									4									
15									4									
									SYMMET	RIX DRILLI	NG: No reco	overy, obsei	ved by dril	ler as	15.40			
									returns of	grey highly	weathered	rock.	,					
16									-									
17									-									
"									-									
18									-									
									-									
19									-									
									-						19.70			
		1 0							-						14/47			
	AR cas		.00-2	0.20r	m					Water	Casing	Sealed	Rise	Time		mmen		DETAILS
										Strike 7.30	Depth	At	То	(min)		Slow	-	
NS.	ΓΔΙΙ	ΔTI		DETA	II S					Date	Hole	Casing	Depth to Water		GRO		VATE	R DETAIL
	Date				RZ Top	RZ Base	e	Ту	De	Dale	Depth	Depth	Water			,		



REPORT NUMBER

1000	a./														I	009	S
ONTR	АСТ	Gr	reate	er Dublin D	Drainage	Sche	me						LLHOLE	NO		14A	
O-ORE		TES										SHE				et 3 of 3	
ROUN			mO	D)				RIG TYPE FLUSH			Knebel Air/Mist		e drill E logg			2/2013 2/2013	
		Fir	ngal	County Co	ouncil			INCLINATI	ION (deg) METER (m	m)	-90 82		LLED B			etersen .O'Shea	
Downhole Depth (m) Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fract Spac Loy (mr	cing g n)	Non-intact Zone	Legend			Descript	ion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0 20.20							 	SYMMET	RIX DRILLI	NG: No reco	overy, obse	erved by dri	ller as	20.20			
1 21.20	100	70	26			(Medium st grey/pale sheared, p argillaceou	trong to very greym fine-g predominant us limestone y weathered	/ strong, me grained, LIM ely calci-silt approx eve	dium to thi IESTONE ite but grad ery 1.00m)	(locally plat ding into	d, stically				
2	100	94	45	_		(. i), (Apertures slightly iron	uities are me are tight to n-oxide stain is are 45-60	open, locally ned, locally	v clay-sme	ared, locall	y				
22.70					-	<u> </u>		End	of Borehole	at 22.70 m				22.70			
5 6 7 8																	
EMAR ole cas		.00-20).20r	m					Water Strike	Casing Depth	Sealed At	Rise To	Time (min)		mment		DETAILS
									7.30						Slow		
														GRO		NATEF	
ISTAL	LATI	ON D	ETA	ILS					Date	Hole	Casing Depth	Depth t Water	⁰ Corr	GRO		NATER	R DETAIL

Appendix F

Chapelmidway to Northern Outfall - Site Plan and Logs

F1





1	
~ \	Legend
	Sites
7	BH + RF
	Amended Pipeline
12/3	Previous Pipeline
-	GeoPhysics
	Pipe Corridor
7	
/	
/	
	Ordnance Survey Ireland License No. EN 0002812 © Ordnance Survey Ireland/ Government of Ireland
	P1 12-04-12 DF BA SM
	Issue Date By Chkd Appd
	Metres
	0 140 280 560
Card	
	AKUP
1	
$\sim L$	50 Ringsend Road
H	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169
Y	Dublin 4
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council
Hand I	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council Job Title Dublin Greater Drainage Scheme
	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council Job Title Dublin Greater Drainage Scheme Location of Boreholes 17 & 18
HE I BA	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council Job Title Dublin Greater Drainage Scheme
HE JAK	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council Job Title Dublin Greater Drainage Scheme Location of Boreholes 17 & 18
ALC DA	Dublin 4 Tel +353 (0)1 233 4455 Fax +353 (0)1 668 3169 www.arup.com Client Fingal County Council Job Title Dublin Greater Drainage Scheme Location of Boreholes 17 & 18 Scale at A3 1:10,000 Job No Drawing Status



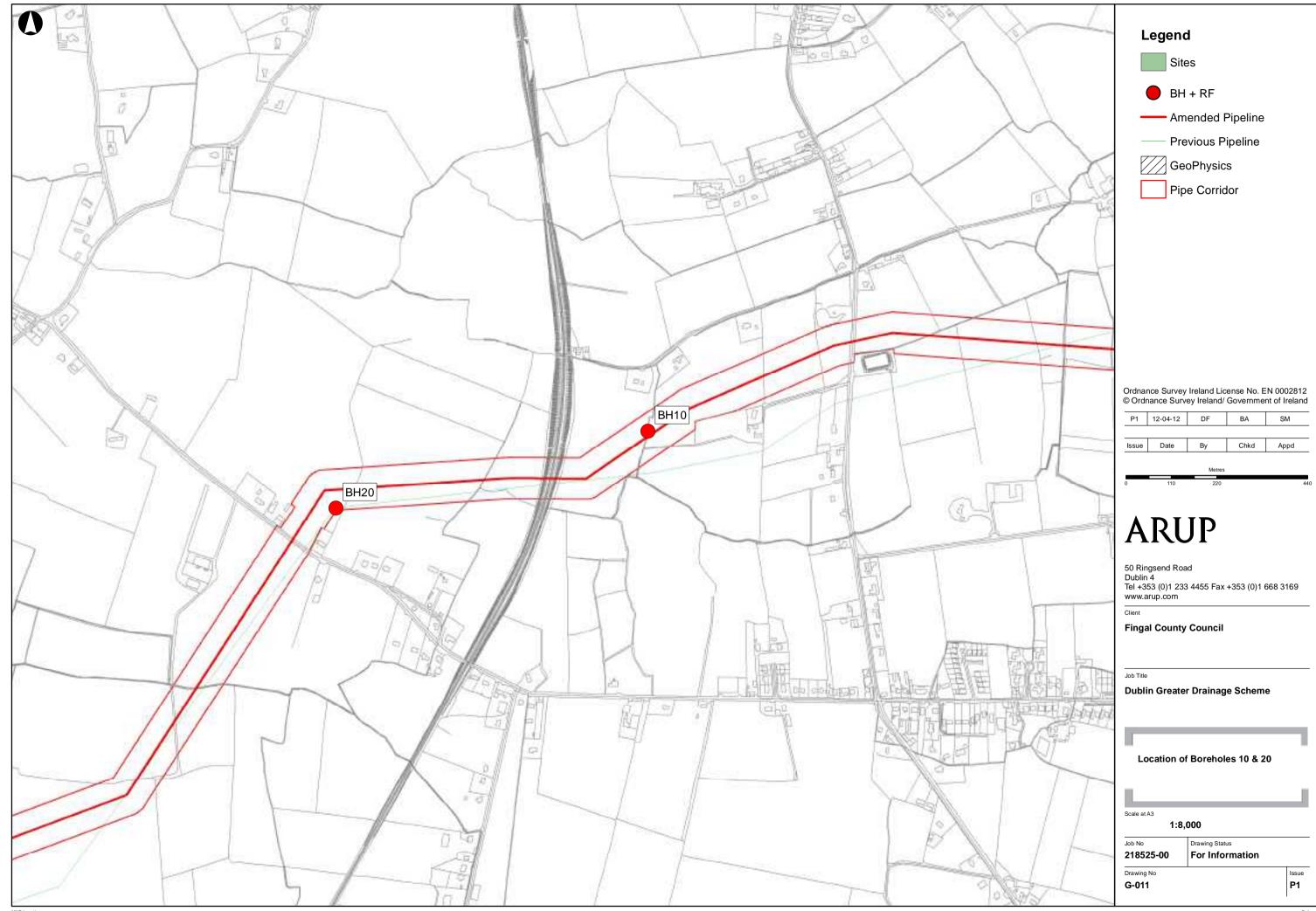
Issue

P1

BA

SM

Appd



(B)	330			GE	OTECHNIC	AL BOR	ING F	RECO	DRD				REPORT NUMBER	
CON	TRAC	n c	reater Du	iblin Drainage S	icheme						BOREHOI	ENG		
11.		LEVEL		3,067.51 E 7,660.39 N 78,49		YPE Hole Diam Hole Dept		nm)	Dando 20 200 3.40	C0			Sheel 1 of 1 NCED 25/02/2013 ETED 25/02/2013	
	INT		ngal Cou	inty Council	SPT H	AMMER REP	NO.		SPT6 55	1	BORED B	1.1.1.1.1.1	WC IY JL	
					- Contraction		1	100	1	Sar	rples	ED 8	<u> </u>	Ē.,
Depth (m)				Description		Legend	Elevation	(m) (peb()	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standoipe
0 1	Soft b grave	iecominy fy CLAY	g firm dar Ywlth a k	k brown sightly w cobble and b	sandy slighty oulder content.				AMESICE	n 0	1.05-1.45		M = 7 (1, 2, 2, 2, 1, 2) M = 16 (2, 2, 3, 3, 4, 4)	
						0.00			ANSSCH		3.00-3.40		N=50110.mm	
	Endio	Boteb	tie at 3.4	0 m		2000	75.09	3,40	-		3.00.0.40		(2, 7, 9, 14, 23)	
5														
a 7														
8														
HAP	ID ST	RATAB	ORNG	HISELLING		4						100	ATER STRIKE DET	011 1
From	100	To (m)	Time (h)	Comments		Water Strike		ang	Sealed At	Ris		a //	Comments	HUL S
3.2		3.4	1.5			3.10	3.1			2.7			Slow	
_						-	1		1.26	_		GR	OUNDWATER PRO	3RE:
	ALLA	A. 2. 52 54 3. V	PTAILS	Top RZ Base	Туре	Date		Hole Xepth	Casing Depth	20	ater Co	mme	nta	
REM	ARKS							Samp	le Legend Deutse (k.t)	_		0-10	roletated tollran Destate Same	

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03	21	an. en		ECHNIC	AL BOR	RING F	RECO	ORD				16695	
CONTR	2003,007 - 11 - 34	and a second	iblin Drainage Sche			_				BOREHOU	E NO.	BH17 Sheet 1 of 1	
	DINATES	25	5,274.53 E 1,201.85 N 23.43	RIG TY BORE	PE IOLE DIAN IOLE DEPT	IETER (n TH (m)	nm)	Dando 20 200 3.10	000	DATE CO		NUMBER OF STREET, STRE	5
	C	ngal Cou	nty Cauncil	SPT H	WMER RE	F.NO.		SPT6		BORED B	Carlora and	WC	-
-	LUR			ENERG	Y RATIO (×9		55	San	PROCESS roles	ED BY	JL.	É.
Dapth (m)			Description		Legend	Llevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe
1 10	0.000		gravely CLAY m dense dark groy	sity gravely	8 X X X	22.33	1,10	3/55	8	1.05-1.45	-	N=8 (1.2.2.2.2.2)	
a Pir	m to stiff bi	ack sandy	y gravely sity CLA	ŕ	o X	21.13	2.30	3759	.	3.00-2.45		1, 1, 2, 2, 3, 4)	
, Me		e datk gre	ey sandy subangule		ana	20.53 20.33	2.90 3.10	3782		1.00-8,45		N = 50/0 mm (23, 51)	
78 "7													
7 7		004/5											
7 7	1	Time	HISELLING		Wate		sing	Sealed	Riss		e Co	TER STRIKE DET	AILS
7 7 1 1 1 1 1	1		1000000		Wate Strip 1,10	De De	pth	Seeled At 2.30	Rise 70 0.60	imit	6 Co	2.0.440.22	AILS
7 7 9 HARD 70m (m 2.9) To (m) 3.1	Tima (h) 1.5	1000000		51riko 1.10	2 De 1.	pth 10	At 2.30	<u>To</u> 0.60) 20	GRO	Sitiw Sitiw UNDWATER PRO	
7 7 9 HARD 70m (m 2.9) To (m) 3.1	Tima (h) 1.5	1000000	Туре	Strie	0 De	pth	At	<u>To</u> 0.60) 20	6) Co	Sitiw Sitiw UNDWATER PRO	

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1	E la	2		GEO	TECHNIC	AL BOR	RING	REC	ORD				REPORT NUM	100
3	NTRA	< I	maler D	ublin Drainage Sch	ame			_			8000	HOLE		
	ace.	INATES	A STREET, STRE	20,704.27 E	RIG TY	ne	-	_	B-22-25-34		SHEE		NO. BH19 Sheet 1	of 1
			2 (m AOD	55,469.62 N	BOREH	PE HOLE DIAM HOLE DEP1		nm)	Dando 21 200 9.70	000	10000000		NENCED 21/02/20	
	GINEE		ingsi Co	unty Council	C. YO K110	MMER RE		6	SPT8			D BY	WC	
	Girter		_		ENERG	Y RATIO (Sel	1	55	Sar	PROC	ESSE	D BY JL	1
Depth (m)				Description		Legend	Elevation	Depth (m)	Ref. Number	Sample	Depth	Ê	Field Test Results	Standpipe
0	Soft cobt	dark bro Ne conter	wn sand) f	y CLAY with a low t	io medium	0.0.0.0.0.0			4463752		1.00-	.45		
		light bro le conter		y gravely CLAY wit	h a medium	00.00	32.11	1.90	AN3753		240-1	645	N = 9 17, 2, 3, 2, 2,	20
						0 0 0 0	30.21		AN3754	a)	8,00-0	ua -	N = 10 (3.4.7,4.4)	90
	Firm	to etiff di le conter	ark brown it and a s	n sandy sity CLAY ow boulder content	with a medium	000	30.21	3.80	AN3755	в	4.00-4	45	N = 10 (3, 4, 5, 5, 5,	0
8						800 B			ANOTSE	5	5.00-5	ias (M = 21 (6, 6, 6, 7, 8, 1	100
,	Very	stiff blac is and bo	k sandy (ulder com	yavely sity CLAY Nent	with a medium	500 F	27.31	6.70	AK3757	n	6,504	95	N = 53(200) m (11, 13, 16, 17,	
									ANGTOD	n	8.00-6	45	N = 60/185 m (12, 13, 16, 18,	
•	End (af Boreina	le at 9.7	0 m :		0.00	24.31	9.70	AN3759		0.63-0	95	N = 5055 ma (20, 5, 32, 18	
HAI	RD ST	RATA 8	ACCIDENTIAL AND A DESCRIPTION OF A DESCR	HISELLING		1			-		-	1	WATER STRIKE	DETAILS
		To (m)	Time (h)	Comments		Water Strike		sing pth	Sealed At	Rise To		Time (min)	Commente	
6. 7.3 9.	75	7 7.85 9.7	0.5 1										No water strike	1
						-		-			_		GROUNDWATER P	ROGRES
1.2.1	TALLA Date		0.0010000	Top RZ Base	Туре	Date		Hale Jepth	Casing Depth	Der W	ater	1000	nenta	
REM	ARKS	1						Sam	Ge Logend		_		- Undetward - David Desired	

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E	-		GEO	TECHNICA	AL BOR	ING F	RECO	DRD					16695	
CONTRA	<u>s</u>	aator Outsia	Drainage Sch	oma		-				BORE	ICILE N	40.	BH20	
CO-ORD	NATES	257,2	87.08 E 86.58 N 54.05		OLE DIAM		wn)	Dendo 20 200	00	DATE O	OMM		Sheet 2 of 2 ED 01/03/2013 D 01/03/2013	e.
CLIENT		gal County			OLE DEPT			10.20 BPT6	-	BORED		LETE	WC WC	83
ENGINEE	R			ENERG	Y RATIO (6) 		55		PROCE		BY	JL	
Dispth (m)		Des	cription		Legend	Bevelon	(m) chiqad	Ref. Number	Sample Type	uples uples		Recorded	Field Test Results	Chandhona
10	of Borehol	e at 10.20 r	m		Stern of		10.20				2 1	2		0
**														
12														
10														
- 14														
15														
+4														
17														
10														
HARD ST	RATA BO	RNGCH	SELLING		-							WAT	ER STRIKE DE	TAIL
From (m) 3.7 5.3 7.6 9.9	To (m) 3.9 5.6 7.7 10.2	Time (h) C 0.5 0.75 0.5 1.5	comments		Wate Strike			At	Rise To		3ma 11(1)	1.2.51	ments	
0.0							Hole	Casing	Dee	office 1			NOWATER PRO	SGRE
METAL	ALININ DE		Test to 1		Dak		Depth	Depth	W	pth to after	Comtr	ents	_	_
INSTALL Date	Tip Dep	th RZ Top	RZ Base	Type	-									

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100	33					GEOT	ECI	INIC	CAL CO	RELOO	RECO	RD				1	669	5
10	NTR	ACT	G	Ireab	er Dublin	Drainage	Sche	me					DRIL	LHOLE	NO	RC	15	
:0	OR	DINA	TES	-	313,06	7.51 E		-					SHE		_		et 1 of 4	-
R	OUN	DLE	VEL	(mO	1.10	0.39 N 78.49			RIG TYPE			Casagran	de CEDATI	E DRILL E LOGG	ED	- 57.722	3/2013 3/2013	
L	ENT				County C				FLUSH			Air/Mist -90	100.11	LED BY		M	. Newla	ind
-	SINE	ER	-	-	1		_	-	CORE DIA	METER (m	m)	90	LOG	GED BY	r	JL.	<u> </u>	<u></u>
 Downhole Depth (m) 	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.0.D.%	Spa 1,0 (m	oture icing og im) og soc soc	Non-imact Zone	puegen	Cased do	wn Shell & /	Descrip				Depth (m)	Elevation	Standpipe Delaits	SPT (N Value)
	4.70	100	35 85 77	15 25 39				[[[] [] [] [] [] [] [] [] []	dark groy occasions calcisitite 8.80-9.11 widely spa shearing a yellow boo (3.40-4.55 Discontinu smooth pi non-penel spaced sm occasiona	black fins g il widely spa LIMESTOM m, 28.85-20 Jood very th at 12.80-13 win non-per im). Otherw uities 3.40-8 anar tight, c shar tight, c trafive discol nooth planar	rained argii ced mediun IE (3.70-3): (30m) and in calcite w 0m) Weath setrative station ise Negliga 25m SET lean with ra- louration. S alcite (-1m)	1: 0-10" clos re yellow br ET 2: Subve ing partly op m) veneer o	ESTONE v band of .70m, medium to lowing plass brown and the space cture surfact tely space own sticel wide en with	vith tic 398	3,40	75.09		
1	7.76	100	80	61	£				7.45-7.70 along frac	m incipient : ture	subvertical	fracture with	i brown sta	ining				
1	8.25	100	100	95	1			T										
100	8.80	100	100	95 53		n (H	spaced pn 45-60" me	edominently dium to wid	medium sp	1: 0-10° clo paced light, smooth plar	clean, SET	2				
12	8.65	100		100				+1	undulating	tight clean		100000000						
_	9.95	-	100	194	- alia		-	1		-	_				here			
		100	00-3.	40m	È.					Water Strike 3.50	Casing Depth	Sealed At	Filee To	Time (min)		ER ST		NETAILS
				120							Hale	10-		1	GRO	UNDW	ATER	DETAIL
1.1	Cale	0.7212	DND	1.1.1.2	RZ Top	97 Por		Tre		Date	Depth	Casing Depth	Depth to Water		ments			
-	Agree	1	4/ 0/8	SIL	NZ 100	NZ Case		Тур	0	21.43.43 21.45-13 22.43-13	3.40 9.05 3.05	3.40 3.40	1.20 6.00 0.00	Water	level re	conded a	t start of a t and of a t start of a	\$1 B

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200	33	P			GE	DTE	CHN	CAL CO	RE LOO	RECO	RD			R		г NUME 669	
co	NTR	ACT	G	reate	r Dublin Drain	age So	heme					DRIL	LHOLE	NO	RC	15	-
		DINA	22.	(mOE	313,067.51 247,660.39 2) 78		_	RIG TYPE	6		Casagran	DATE	089.11	ED	21/0	et 2 of 4 0/2013 0/2013	
	ENT		F	ingal	County Counc	al .		INCLINAT	ION (deg) METER (m	m)	Air/Mist -90 90	100000	LED BY GED BY		M Jil	. Newla	nd
Downhole Depth (m)	Core Run Depth (m)	T,O.R.%	S.C.R.%	R.O.D.%	Fracture Spacing Log (mm)	500	Romanu cuora			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	11.05	100	100	900				dark grey occasions calcisitite 8.60-9.11	black fine g i widely spa LIMESTON m, 28.95-29	rained ergil ced mediur VE (3.70-3.9 1.90m) and	to thinly be accous LIM in thickness 30m, 7.50-7 occasional (ESTONE y band of 70m, nedium to	nth				
	11.95	100	100	92				yelow bro	at 12.80-13.	Orn) Weath retrative sta	en (ranely sh ering: Slight ining on frac ble.	brown and	20. I				
		100	100	100	-	E	干	smooth pl	anar ticht, c	lean with ra	1: 0-10" clos re yellow br	OWT	8				
3	13.50	100	100	93	-			spaced sr occasions	rative disco nooth plana il very thin c	louration, 5 r to undulat alcite (~1m	ET 2: Subve ing party op m) veneer o vein (continu	rtical widey on with h exposed	ł				
•		100	100	68	5	-40		13.70-13.	95m Incipie	nt fracture 7	*0* partiy op	en					
1	14.80	100	100	71	2		H										
	16.80	100	100	100	-			fracture tig 15.50-15.	ahit 80m 75* fra	clure smoo	ong incipient th stepped al fracture s		ł				
7		100	100	97		-	ннн										
9	18.30	100	100	94	F												
	19,70	15					T		70m 45° fra rative velky		th planar wit	h		_			
-	CRS	the state of the s	00-3	40m					Water Strike 3.50	Casing Depth	Sealed At	Pose To	Time (min)	-	ER ST	RIKE D	ETAIL
5	TALL	ATIC	ON D	ETAB	LS		_	_	Date	Hole	Casing	Depth to Water	Com	GRO	UNDW	ATER	DETAIL
1	Date	1	ip De	oth F	RZ Top RZ E	3994	Т	<u>pe</u>	22-03-13 25-03-13	Depth \$4,80 \$4,80	2.40 3.40 3.40	3.00 1.35	Water	level re		fend of a I siat of s	

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20	5%	アシ			GEOT	EC	INIC	CAL CO	RELOG	RECO	RD				EPORT	669	
co		DINA'	TES	ireater	Dublin Drainage 313,067.51 E 247,660.39 N 0 78.49		me	RIG TYPE	8		Casagran	SHEE	-	-	21/0	15 at 3 of 4 3/2013 3/2013	
	ENT		F	ingal (County Council			FLUSH INCLINATI CORE DIA	ION (deg) METER (m	m)	AldMist -90 90	DRIL	LED BY	i	M	. Newla	nd
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.O.D.%	Frecture Specing Log (mm) 250 500	Non-inlact Zona	Legend			Descrip	tian			Depth (m)	Elevetion	Standpipe Details	SPT (N Value)
20	21.20	100	100	100		-00 9985											
n	22.30	100	100	100				21.60-22.0 brown nor	0m 70-80* f i penetrativi	tacture sm e discolours	ooth undulat stion on frac	ing with on ture surface	ange Is				
23	z <u>3.00</u>	100	100	100				22.40-22.5 brown nor	50m 60° fra Npenetrativo	cture smoo e discolours	th undulatin ation on frac) with oran Ure surface	215	23.00	55.4 9		
24	24.40		105	85.	2			wackestor	90m Strong te LIMESTO n Possible I	ONE (claste	ported fossil up to 45mm coulder	iferous mu }	d-rich				
	25.90	97	93	n	Σ			wall streng 25.67-25.6	jth 38 Soft grey	CLAY ven) veinfill redu eer on nan-l	0001-171/075					
25		100	90	69				medium id	i coarse gra	ve ragne	115						
1	18.00	100	100	100													
28	8.65	100	82	77		_											
- BX	8.95	100	100	100	1												
	06.21	100	88	88				29,70-29,8	10m Non-int	act annula	medium to	charee					
	AR	KS ad D.	00-3	4Qm					Water Strike 3.50	Casing Depth	Sealed At	Rise To	Time (min)	-	ER ST		ETAIL
NST	TALL	ATIC	N D	ETAR	s				Date	Hole	Casing	Depth to Water	Com	GRO	UNDW	ATER	DETAIL

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-	83	2						CAL CORE LO	G RECO	RD				1	669	5
:0		DINA'	TES		Dublin Drainage 313,067.51 E 247,660.39 N 0 78.49	0	T.0	RIG TYPE		Casagrand	SHEE	-		21/0	15 at 4 of 4 3/2013 3/2013	
u	ENT	S.,	Cristian Control	0.000	y rowy County Council			FLUSH INCLINATION (deg) CORE DIAMETER (Air/Mist -90 90	DRIL	LED BY			Newla	
S LOWTIDIE UEDTI (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	ROD.%	Fracture Spacing Log (mm) 350 SSC	Non-intact Zone	Legend	gravel-sized fragme	Descrip				(m) (adec)	Elevation	Standpipe Details	SPT (N Value)
	MAR) a cas	KS ed 0.	00-3.	40m				Water Strike 3.50	Casing Depth	Sealed At	Rise To	Time (min)	1.2.2	ER ST	RIKE D	DETAIL
2.	TALL			ETAIL	S IZ Top RZ Base		Typ	Date	Hole Depth	Casing Depth	Depth to Water	Com	GRO		ATER	DETAI

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13	100	P-			G	BEOTI	ECH	INIC	CAL CO	RE LOO	RECO	RD			R	EPOR 1	669	
ONT	RA	CT	G	reale	r Dublin D	irainage	Sche	me					C3127	LHOLE	NO	RC		
:0-06			/0.9	ImOi	315,274 251,201	53 E .85 N 23.43			RIG TYPE			Casagran	DATE DATE	DREI	ED	27/0	et 1 of 3/201: 4/201:	3
	π	1.			County Co	N Marcolanda			FLUSH INCLINATI CORE DIA	ION (deg) METER (m	m)	AinMist -90 90	DRIL	LED B	Y		New	
Core Run Deolh (m)	full under once area	T.C.R.%	S.C.R.W	R.Q.D.%	Fracti Spaci Log (rom 1 210	ing g n)	Non-Inlact Zone	Legend	Cased do	wn Shell & J	Descrip Auger Hole				(m) titled	Elevation	Standpipe Details	SPT (N Value)
4.0		10 80	0	0					Highly We subangula strong to v with subor pockets of Weatherin brown surf argilisceou	athered Ro ir gravel- an ery weak bi cinate black firm black (g. Recover, face discolo as limestoni	ckhead rec d cobble-si lack and gr c MUDSTC gravely clay y completal uration on a. (8.0 - 8.1	with cobbles naceous lim zed fragmer ey argitaceo NE: Frequer y foor Roor y non-intact. cobble-sized 0m) recovered n	estone ngular to its of Mediu us LIMEST nt cobble-si avery). Rare oran i tragments	im 'ONE zed 28	10.16	20.43		N = 50,07 (9, 15, 2 N = 50,07 jaco (17, 6, 5
7.84		100	0	0														N + 5540 m (18, 7, 60
9.00	T	50	0	0			見る											N = 50/0 m
9.50							16	井										(25, 50)
EMAI die ca			00-12	2.00m	1		24			Water Strike 1.20	Casing Depth	Soaled At	Rise To-	Time (min)	-	TER ST		DETAILS
STAI		1000	10.2		7.5.5					Date	Hole	Casing Depth	Depth to Water	Com	GRO		ATER	DETAIL
Dat	8	T	p De	<u>oth</u>	RZ Top R	RZ Base		Typ	e	27-03-13 27-03-13 28-03-13	3.10 7.50 7.50	7.50	1,25 5,50 0,20	Water pre-bo Water	rievel re	eborded is a babroos stanteos	t end of	INT

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1	£ 1. 133	R			GEOT	ECI	HNIC	CAL CO	RE LOG	RECO	RD			R	EPORT	669	
0.5	ONTR			ireate	2 Dublin Drainage 315,274.53 E 251,201.85 N	Sche	me					SHE	-	ED		17 1 2 of 3/2013	
	OUN	and the second	00000		0) 23.43			RIG TYPE FLUSH			Casagrand Air/Mist	12000	1000	211	02/0	4/2013	1
20.7	GINE		-	ngai	County Council	_		INCLINATI CORE DIA	ON (deg) METER (m	m)	-90 90	10000	LED BY GED BY		M JL	Newt	and
Downhole Depth (m)	-	T.C.R.%	S.C.R.%	R.C.D.%	Fracture Spacing Log (mm) 9 250 500	Non-Intact Zone	Legend			Descrip	tion			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.50	30	ų.	0			H	subangula	r gravel- an	d cobble-st	overed as an zed fragment	s of Medi	um				-
	11.00	100	D	0		4	H	with subor	dinate black	MUDSTO	ey argiteceo. NE. Frequen / (Poor Reco	cobble-s	TONE				N = 50/0 m (16, 9, 60
ï		60	٥	0			H	Weatherin brown sur	g: Recovery	uration on	y non-intact.	Rame ciran	ige s af				
12	12.90	50	0	0			H	Discontinu (continued	ເພື່ອs 4.50-1 ກິ	3.0m Core	recovered no	n intact					
1	12.50	100	0	0		69	F										
-	13.00	109		w.		16	T.	Medium st	rong dark g	rey and bla	ck very thin t	thinly be	odded.	13.00	10.43		
	13.70	100	56	47		-	4	fine graine spaced ve	id argillaceo ry thin weak	MUDSTO	ONE with do NE bands an with brecciate	ealy to m d occasio	edium nal				
H								material (1	13.10-13.26	, 13.45-13.	61m & 14.44 play occasion	-14.75m)	2				
		82	59	ŦØ.	F		Ţ,		very weak		very closely	aratere i					
13	15.00	2	_	_		_	-1	spaced sm non intact	pianal gravel-size:	r occasiona d fragments	ly associated of arcitaced	with ang us limest	viar one	15.00	8,43		
								\(<2mm)	one, partly		occasional bi	ick clay s	mear				
16								Elst s	a polencie	at 15,00 m							
17																	
															6 4		
19																	
	MAR	(5	-	-		- 1								WAT	ERST	RIKE	DETAILS
ick	e cats	ed 0.	00-12	2.00m	n				Water Strike 1.20	Casing Depth	Sealed At	Rise To	Time (min)	-	mments	_	
45	TALL	ATK	ON D	ETAI	LS				Date	Hole	Casing	Depth to Water	Com	GRO		ATER	DETAILS
	Dale	7	ip De	pth	RZ Top RZ Base	-	Typ	99	28-03-13 02-04-13 02-04-13	Depth 13.00 13.00 14.00	12.00 12.00 12.00 12.00	9,00 9,00 9,00	Water Water	ievel te	corded al	talat of	shift

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	NTR				Dublin Drainage	Sche	67710					DRIL	LHOLE	E NO	RC	19 nt 1 of 3	
		D LE		(mOD	320,704.27 E 255,469.62 N 34.01			RIG TYPE FLUSH			Knobel Air/Mist	10007	DRILL		26/0	2/2013 3/2013	
N	ENT		F	ngal C	County Council		_	INCLINATI		im)	-90		GED B			etersen O/Shea	
(m) rugen neptiver (m)	Core Run Depth (m)	T.C.R.%	S.C.R.W	R.O.D.%	Fracture Spacing Log (mm) 220 sod	Non-Inlact Zone	Legend	Cased dov	vn Shell &	Descrip Auger Hole		_		Depth (m)	Eleveson	Standpipe Details	SPT (N Value)
								SYMMET returns of	NX DRILLI medegroun	NG: No rac	overy, obser g of Sheli &	ved by drill Auger Fill	er as		30.21		
EN	Cas	and the second	00-20	0.00m			-H	-	Water	Casing	Sealed	Rise	Time	1	TER ST		ETAIL
ole									Strike	Depth	AL	To	(min)	100	. miner po	(s)	

(all	(E) (E) (E)	A			GEOT	ECI	HNIC	CAL CO	RE LOO	RECO	RD			R	eport 1	'NUM	
co	NTR	ACT	G	reate	r Dublin Drainege	Sche	erne						HOLE	NO	RC		
		NA		(mOI	320,704.27 E 255,469.62 N 0) 34.01			RIG TYPE FLUSH	3		Knebel AinMist	100,000	T DRILL LOGG	1011	28/0	et 2 of 2/201 3/201	3
EN	ENT		F	ingal	County Council			INCLINATI		m)	-90	1.007	LED B		10.00	kerser O'She	
Dawnhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.O.D.%	Fracture Spacing Log (mm) 288 ast	Non-Inlact Zone	Legend			Descrip	tian			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10							A Property of	otibles ar	gray sandy to boulders	very grave (continued	avery, obser	ved by drill	Af ses	11.80	22.21		N = 50/580 mon (18, 54, 19, 22, 50
12							ANO CHANG	returns of and bouid	grey sandy ars.	gravelly do	ry with oocar	ional cobbi	es				N = 40 (0.8, 9, 11, 8 12)
14								mburns of r	RIX DRULLI grey very si id boulders	andy gravel	overy, obser ly day with o	ved by drill xcasional	or as	14.10	19.91		N = 50(116 mm (9, 13, 27, 23
18							19-19-19-19-19										N = 75/110 min (25, 50)
17							の可の見	SYMMETI	NX ORIU U	NG: No and	overy, obser	and by drift		17.90	16.11		N = 50/145 mm (19, 6, 23, 27)
18							1 ALACAD	returns of I and bouide	brown sand	y gravały c	lay with coo	aaionei cob	bles				(7, 10, 9, 8, 14, 16)
							いの	SYMMETR returns of t	RIX DRILLI	NG: No rec y very grav	overy, obser- elly clay with	ved by drille occasional		19.60 20.00	14,41		
-	AR		00-21).00er					Water	Casing	Sealed	Rise	Time	WAT			DETAILS
									Strike	Depth	At	То	(min)		20199-0-824		recorded
				10000	111									GRO	UNDW	ATER	DETAILS
	Date	33.0	103.10	ETAI	RZ Top RZ Base	1	Typ		Date	Hole Depth	Casing Depth	Depth to Water	Com	ments	E)		

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12	33 NTR	ACT	G	heater	GEOT Dublin Drainage			CAL CORE LO	G RECO	RD		LHOLE	NO	RC		
		DINA		(mOD	320,704.27 E 255,469.62 N I) 34.01			RIG TYPE FLUSH		Knebel AinMist	C (20)	T DRILLI LOGGI		28/0	et 3 of 3 2/2013 3/2013	
N	ENT		F	ingal (County Council			INCLINATION (deg) CORE DIAMETER (-90		LED BY			elersen O'Shee	
2 Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 1 250 Sec	Non-inlact Zone	Legend	cobbles and bouide	Descrip				Depth (m)	Elevation	Stantpipe Details	SPT (N Value)
2 5 4																
25 28 29																
2 T 9 9	IAR	A COLUMN	00-20	2.00m				Water Strike	Casing Dapth	Sesled Al	Rse To	Time (min)	Cor	nment	RIKE D strike n	

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co	NTR	ACT	G	irester	Dublin Drainage			CAL CO					LHOLE	NO	RC		
		DINA		(m00)	324,487.08 E 257,266.58 N 54.06			RIG TYPE FLUSH	N.		Knebel Air/Mist	4.12 C 2	ET DRILL LOGG		11/0	et 1 of 3 3/2013 3/2013	
	GINE		F	ingel C	ounty Council			INCLINATI		m)	-90 82		LED BY		PA JL	elersen	
TUMPTING LEDGE (TT)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 250 500	Non-inlact Zone	Legend	Cased do	an Shell & J	Descrip Auger Hole	ton			Depth (m)	Elevation	Standpipe Details	SPT (N Value)
								SYMME TI returns of	RX DRILLI Shell & Aug	per Fill	overy, obser		if as		47.55	RIKE	
a de la com	VAR) I Cas	KS ed 0.	00-17	7.0m					Weter Strike 13.20	Casing Depth	Sealed At	Rise To	Time (min)		mmenta		ETAIL

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Na.	51	FE			GEOT	ECI	HNIC	AL CO	RELOO	G RECO	RD			R	EPORT	669	1758-54 1759-54
ço	NTR	ACT	G	irealor	Dublin Drainage	Sche	erne			-		DRIL	LHOLE	NO	RC:	20	
	ORE			(mOE	324,487.08 E 257,266.58 N I) 54.06	1		RIG TYPE FLUSH	5		Knebel Air/Mist	100.000	ET DRILL LOGG		11/0	st 2 of 3/2013 3/2013	3
0.00	ENT	ER	F	ingal (County Council			INCLINATI		im)	-90 82	100000	LED B	P	Pe	larse	n
Dowrhole Depth (m)	Care Run Dapth (m)	T.C.R.%	S.C.R.%	RQD.%	Fracture Spacing Log (mm) 1 250 sog	Non-Intact Zone	Legend			Descrip	ition			Depth (m)	Elevation	Standpipe Details	GPT (N Value)
10							0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SYMMET returns of	REX DRILLI stiff grey gr	NG: No rec avely bous	overy, obser ter clay	ved by drill	er as	10 20	(43.85		N = 50/13 mm (8, 16, 24, 1
13							9 9 9 9 9	SYMMET returns of	RX DRILLI brown very	NG: No rec sendy grav	overy, obser elly boulder	vəd by driši clay	er 45		41.28		N = 29 (0. 7, 7, 10, 6)
94 95							1940 04 0 196	SYMMET returns of	RIX DRILLI stiff grey gr	NG: No rec avely bouk	overy, obser ler clay	ved by drife	er as	14.00	40.06		H - 5001 mm (11, 14, 11 18, 17)
15							1 1 1 1	SYMMET? returns of t	RIX DRILLI black heav	NG: No reo ly fractured	overy, obser rock / Poss	ved by drile ble fault br	er as eccía.	16.10	37.96		N - 50,42 (35, 29, 2)
17	18.50	7	D	¢				occasional angular to fragmenta,	gravel-size subangular Weatherin lities 17.0-2	id pocket o medium to g: Negligat	eous LIMES firm black c coarse grav le. cult to disce	ay recover el-sized	ed as	17.00	37.06		
19	9.90	15	0	۵			HHHH							10.00	34.26		
1	ARP	re				1.2	1					_	_		20.05		
	1 CBS		00-1	7.0m					Water Strike 13.20	Cesing Depth	Scaled At	Rise To	Time (min)		IER STI		DETAILS
100	TALL		1000	ETAIL	.S KZ Top RZ Base		Тур		Date	Hole	Casing Depth	Depth to Water	Com	GRC		ATER	DETAILS

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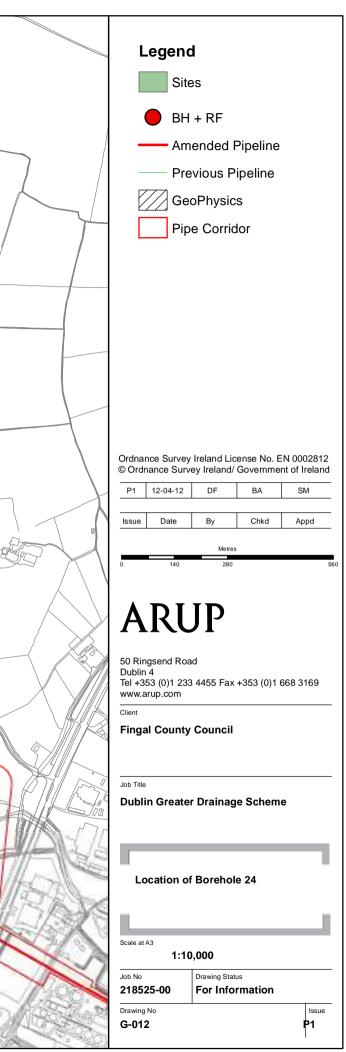
200	rt os	2)			GEOT	ECH	INIC	AL CORE L	OG	RECO	RD			RI		669	
:0	NTR	ACT	G	raste	r Dublin Drainage	Sche	me					DRULI	HOLE	NO	RC	20 at 3 of 3	
		D LE		(m00	324,487.08 E 257,266.58 N 2) \$4.06			RIG TYPE FLUSH			Knebel	DATE	ORILLI	1.5.5	11/03	3/2013 3/2013	
a	ENT	R.	-		County Council			INCLINATION (d CORE DIAMETE		10	Air/Mist -90 82		LED BY		Po	dersen	
Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 220 500	Non-Intact Zona	Legend			Descript				Depth (m)	Elevation	Standpipe Details	SPT (N Value)
20		39	6	0			-1	Medium strong of LIMESTONE with fractures and mo- hait-line calcite v	fark gr th mult	ey breccial tiple very cl	ed argillace osely space	ous d incipient					
	20.70	0	0	0	6 B		-1	hait-line calcite v	veins a	m black cta issociated	y. Frequent with breccial	very thin ion. (contin	wed)	20.70	33.36		
it)	1 20		<u> </u>	-			-	End of Bon	ehole i	at 21.20 m				21,20	32.86		
24 25 26 27																	
20																	
99																	
10.00	AR	cs ed 0.	00-17	7.0m				Wa Stri 13.	ke	Casing Depth	Sealed At	Rise To	Time (min)	1000	ER ST		ETAIL
													_	GRO	UNDW	ATER	

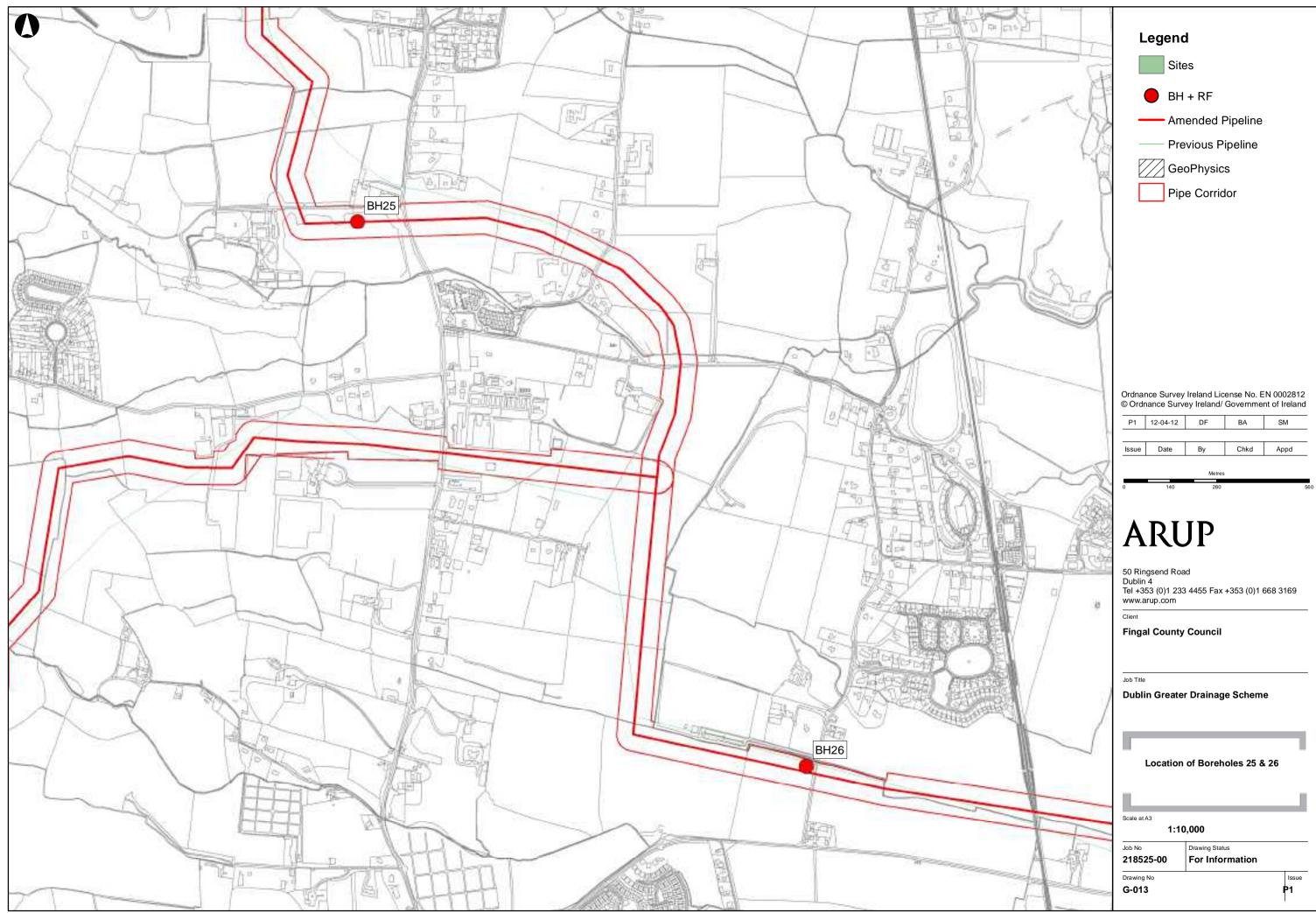
Appendix G

Saucerrstown to Southern Outfall - Site Plan and Logs

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100	(ch		GE	OTECH	NICA	ROP		ECC	חסר				R	PORT NUMBER	
03	131./		GL	oreen	NICA	LBOK	ING P		KU					16695	
CONT	RACT G	reater Dub	sin Drainaga S	cheme							BORE	22.22	NO.	BH24 Sheet 1 of 1	
	RDINATES	249	1,057.22 E 1,126.22 N 10.76	B		E LE DIAMI		m)	Dando 20 200 4.20	00		COMN		ED 26/02/2013	
	NT FI	ngal Cour	ily Coundi		0.01010	MER REP	0.000	- S	SPT6		BORE	20020		wc	
T	ICCA			15	NERGY	RATIO (S	9		55	Se	PROCE moles	ESSEC	BY	JL	
full under		¢.	lescription			Legend	Elevation	Depth (m)	Ref. Number	Sample	Depth	tu l	Recovery	Field Test Results	Standpipe
	Soft becoming) firm dark	brown sandy g	gravelly GLA	X				ANESOS	8	1.00-1.	48		N=7 N.Z.Z.L21	
			groy sity sand by graveity CLA			-	8.76	2.00	ANBSOG	: B	3,00-2	40		N = 11 (2, 3, 3, 5, 2, 3)	
	ubrounded fi	ne to coan	Ry sandy subar se GRAVEL. S CLAY with a lo	and is coars	e.	000 Q	7.96	2.80	ANI8527	.0	3,05-3.	40		N = 15 (3, 4, 4, 3, 4, 5)	
2	Aedium dense	s grey sig subround	ntly clayey/sity ad fine to coars	sandy	- 3	9 m	5,86 6.56	3.90	AN8508	e	4.00-6	45		N = 5075 mm (21, 4, 40, 10)	
10.000	STRATA B	the second second				00000		ing 1	Ranked 1	13-			WAT	ER STRIKE DET	AILS
SARD om (r 2.6	m) To (m) 2.9	Time (h) 0.5	HSELLING Comments			Water Strike 2.40	Cas Der 2.4	nh 0	Sealed At 3.40	Ris To 1.8	0	nin) 20	Con	uments Slow	AILS
IARD	m) To (m)	Time (h)				Strike	Dep	nh 0	AL	To	0	Time min)	Con	uments.	AILS
iARD om (r 2.8 3.9	m) To (m) 29 42	Time (h) 0.5 1.5				Strike 2.40 3.90	2.4 3.9	nh 0	At 3.40	1.8 3.0	0	Time min) 20 20	Ma	uments Slow	
iARD om (r 2.8 3.9	m) To (m) 2.9 4.2 ELLATION DE	Time (h) 0.5 1.5		Туре		Strike 2.40	Deg 2.4 3.5	0	AL	To 1.8 3.0	0	Time min) 20 20	Ma	imants. Slow xderate	

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6	ers.	A		GEOT	ECHNIC	AL BOR	NG	RECO	ORD				RE	PORT NUMBER	2
10	38	۶/												16695	
CO	NTRA	NCT G	ireator Du	ublin Drainage Sche	me .						BORE		NO.	BH25 Sheet 1 of 1	
		INATES		20,983.94 E 13,516.99 N 17.69		PE IOLE DIAME		nm)	Dendo 20 200 10.00	000	DATE	COMM	10000	0 08/02/2013 0 08/02/2013	
1.5	ENT		ingal Cou	inty Coundi	SPT HA	MMER REF	NO.	1	SPTE	- 1	BORE	BY		wo	-
EN	SINE	iR.			ENERG	Y RATIO (S	}	-	55		PROCE	ESSEL	DBY	JL	-
Depth (m)				Description		pueder	Elevetion	(m) rtiged	Ref. Number	Sample	1.2.4.4.4.	-	Recovery	Field Test Results	Standpipe
9			wn slight bble com	y sandy gravelly CL lent	AY with a low	00	ų		0.2	10 F	0.	-	œ		<i>tõ</i> (
M						0.0.0			AN3852		1,00-1	45		N = 11 (2, 2, 1, 2, 2, 2)	
N.						0.00			4413153	10	3.09-2	411		N = 12 (2, 3, 3, 2, 3, 4)	
						10 0 0			ANDREA	э н	1.00-a.	45		N = 12 (3, 3, 4, 4, 2, 2)	
•						000			AN-9655	8	4.00-4	45		N= 17 (3, 4, 4, 5, 4, 4)	
Ŧ						0.0.0			AN2606	0	5.005	*5		N = 25 (4, 8, 8, 8, 8, 8)	
8	0.000	ni Joht hi		ty GRAVEL. Sand a		0.0.0	10,89	6.80	893457	0	1.60-6.	25		N = 471170 mm (2, 3, 4, 12, 31)	
7	Grav	el is subi slone.	angular to ard dark t	y ork vet. Sand a subrounded fine to rrown slightly sandy	medium al	10	10.39	7.30	-						
•						8 8 8 8 8			A4G858	.0	0.00-6.	is	3	N = 50/210 mm 8, 14, 18, 19, 15)	
•							7.69	10.00	ANGESS	a	R55-93	6		N = 58190 mm 8, 12, 16, 21, 11j	
			Time	DRISELLING		Water	1.19	sing	Sesied 1	Rise			1	R STRIKE DET	AILS
-	r (m)		(h)	Comments		Striko	De	pth	AL.	To	6	lime min)		menta	
2.1	55	2.85 4.85 7.2	0.5 0.75 1.5			6.80	6	80	7.30	6.2	8	20	s	bw	
		_					1			il.	-	1	ROUN	DWATER PRO	GRES
- 10 C	100104	ATION D	1100015660	-	-	Date		Hole Depth	Casing Depth	Der	ater	Comn	1000		
1)ate	Tip De	oth RZ	Top RZ Base	Туре	-									
EN	ARK	S Boreho	sie termin	isted al required dep	ith			D-Sciel	to Legend District (00) District Mathematical Plate District Concerning Large			9	- Undiplums - Undiplums - Weiter Ear	d 12000 Datum Inco	

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1	1	2			G	EOTEC	HNIC	AL BORI	NG F	EC	ORD				REPORT NUMBER	
1.20	33.			0.573	20.525										16695	
2.02	TRA	02911_9	CONTRACTOR OF T	0.03		Scheme						_	BORE	HOLE	NO. BH26 Sheet 1 of 1	É.
1000		INATES		1,80	9.33 E 9.63 N 12.60			PE IOLE DIAME IOLE DEPTH		m)	Dando 20 200 10.00	00	2162.00		VENCED 02/03/2013 PLETED 02/03/2013	3
CLIE			ingal Cou	unty C	Council		10031036	MMER REF.	Same a		SPTB		100000	DBY	wc	
T	INEE	ĸ		-			ENERG	Y RATIO (%)	2.1		55	Sa	PROC	ESSE	DBY JL	1
Depth (m)				Desc	atplion			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	î	Field Test Results	Slandpipe
1	Soft	becomin ly sighty	g lim də gravally	CEAT	wn lo gri r	ay brown sli	ignity				AN85 17	a	1.00-1		(L.2.2.3.7.1)	
E								2 2			APADD 10		2.00-2	145	N=8 (3, 3, 2, 2, 2, 3)	
	Firm with	to stiff bi a low to r	ack sligh nedium o	tly sa tobbk	ndy siigh e content	dy gravely	CLAY	0.00	9,70	2.90	AA8519	. 1	3,00-3	LHS .	N = 15 (1, 4, 4, 3, 4, 4)	
4								0 0 0 0			AN8820	D	4,00-4	45	N = 25 (5, 6, 5, 6, 5, 10	
e 0								1000 A			A58621	.0	4.00-6	45	₩ = 24 (4, 0, 5, 7, 5, 5)	
7	Saff	o very st	IT dark br	own	sandy sli	ghilly gravel	IY CLAY	1040 10 0	6.70	8.90	ANII 522	8	8.904	.93	(6:7:6.8.10.11)	
	retifi i	a 1997 19 1	nousum o	autori	a content			01040 010			A140523	ŝ	6.00-B	ai.	N = 41 (2, 2, 0, 10, 11, 11)	
								0.010.0	2,60	10,00	ANZEGR	8	0.50-0	95	N = 490385 mm (7, 12, 12, 13, 13, 11)	
HAR	C	12.1.1	Time	1	Contraction of the local division of the loc		_	Water	Cas		Sealed	Rip	a	Time	WATER STRIKE DET	AILS
3.5	- · · ·	To (m) 3.8	0.75	100	riments		_	Strike	Dep		AL	To		(min)	Comments	-
5.7 8	1	6.9 8.3	0.5												No water strike	
_					_				-						I SROUNDWATER PRO	GRES
100	ALL/	Tip De		Top	RZ Base	Тур	20	Date		icle epih	Casing Depth	20	oth to alter	Conv	nenis	
EM,	ARK	8 Boreho	ale termin	ated	at require	ed depth				D-568	Ne Legend District Jun District Philipping Loss		-	2	- Unbidded Mires Barwier Sara - Urbituted Pater Sarpis	

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5	103	PB				GEOT	ECł	INIC	AL CO	RE LOO	RECO	ORD			A.		1669	
:0	NTR	ACT	G	reate	Dublin (Drainage	Scher	me					DRIL	LHOLE	NO	RC	24	-
20	-080	DINA	TES		317,06	7 22 F		1					SHE				at 1 of 2	2
				(mOt	249,12				RIG TYPE			Casagran	de CODATE	I DRILL E LOGG	ED	10100	4/2013	
u	ENT	87		7.5000	County C				FLUSH INCLINAT CORE DIA	ION (deg) METER (m	en)	AinMist -90 90	DRIL	LED B	r		. Newla	
 Downhole Depth (m) 	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.0.D.%	Spe Lo (m	ture cing 99 m) 0 sec	Non-inlact Zone	Legand		wn Shell & J	Descriț				Depth (m)	Elévation	Standpipe Details	SPT (N Value)
	5.40 8.60 8.75	100 100 100	100 100	28 100 65					Strong gre fossillerou occasiona sheared m Discontinu predomina	is fine grain I thin calcite tatrix. Weat Ittes 5.0-10	grey thin to ed argitac veins (<1r hering: Neg 10m 5-20° h speced s	medium be eous LIMES	FONE with ity plastical	ly Nd		6.56		
-inter	MAR			100											10.00 WAT		RIKE	ETAILS
0k	0.086	ed 0.	00-6.	00m						Water Strike 2.80	Casing Depth	Sealed At	Rise To	Time (min)		mment		
														_				
												1.0		-	GRO	UNDV	ATER	DETAIL
0.	TALL	1000			i and the second se	RZ Base		Typ		Date m-o4-13	Hole Depth 7.45	Casing Depth 5.00	Depth to Water 2:00	and the second second	ments		ATER .	

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200	93 93				GEOT	ECH	INK	AL CORE LOG	B RECO	RD					T NUME	est.
:0		INA	res		Dublin Drainage 317,057,22 E 249,126,22 N	-	772	RIG TYPE		Casegrani	SHE	DBUL		02/0	24 et 2 of 2 4/2013 4/2013	
LI	ENT	211		(mOD ngal C) 10.76 County Council			FLUSH INCLINATION (deg) CORE DIAMETER (m	mà	Ain/Mist -90 90	DRIL	LED BY			Newla	11.
UOWTINDIE DEPEN (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.0.D.%	Fracture Specing Log (mm) 255 600	Non-intact Zone	Legend	End of Borehoie	Deacrip	llan	1000		Depth (m)	Elevation	Standolpe Detalls	SPT (N Value)
n																
2																
•																
5																
6																
r																
R.																
	LARK	(S ed 0.1	00-5/	00m				Water Strike 2,80	Casing Depth	Sealed At	Rise To	Time (min)	-	ER ST		ETAILS
ST	ALL			ETAIL	S IZ Top RZ Base		Typ	Date 03-04-13	Hole Depth 10.10	Casing Depth 5.00	Depth to Water	Com			ATER	DETAIL

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