## Appendix 13.1B

Arklow SI Causeway 2018



## **Arklow Sewerage Scheme - Marine Outfall Site Investigation**

Client: Irish Water

Client's Representative: Byrne Looby ARUP J.V

Report No.: 17-0167

Date: January 2018

Status: Final for Issue



**Project No.:** 17-0167

Client: Irish Water

Client's

**Project Name:** 

Arklow Sewerage Scheme Marine Outfall GI

Representative:

Byrne Looby ARUP J.V.

## Legend Key

Locations By Type - CP

Locations By Type - CP+RC



Title:

Exploratory Hole Location Plan

**Last Revised: Scale:** 22/11/2017 1:3000



Project No.: 17-0167 Client: Irish Water

**Project Name:** 

Arklow Sewerage Scheme Marine Outfall GI

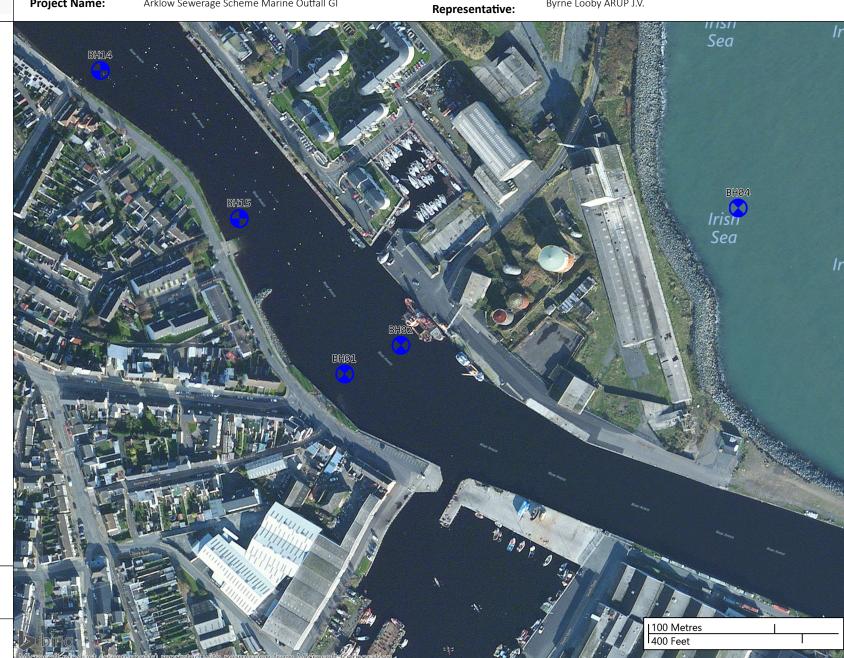
Client's

Byrne Looby ARUP J.V.

## Legend Key

Locations By Type - CP

Locations By Type - CP+RC



Title:

Exploratory Hole Location Plan

Last Revised: Scale: 22/11/2017 1:3000

20					Projec		-	: Name:	Borehole No.:
	CAL	JS	E	VAY	17-016			Sewerage Scheme Marine Outfall GI	BH01
		— C	ĒΟ	TECH	Coordi		Client:		Sheet 1 of 3
Method	Pla	nt U	sed	Top Bas	32510			s Representative:	<b>Scale:</b> 1:50
Cable Percussion	Dan	ido 3	000	0.00 20.5	17307	0.75 N		Looby ARUP J.V.	<b>Driller:</b> CC+TA
Rotary Drilling	Coma	acchi	o 405	20.50 25.0	Groun	d Level:	Dates:		
Depth 5	Sample /	Casing	Water		-3.8 Level	6 mOD  Depth (m)		2017 - 05/09/2017 I	Logger: SG
(m)	Tests	Depth (m)	Depth (m)	Field Records	(mOD)			Description	Backfill
0.00 - 1.00	B1						*** ****	Black very gravelly silty fine to coarse SAND. Gravel is subrounded fine to medium.	
0.50	ES28					(1.00)	×, × , ×, ×		0.5
						[	× × ×		
	D2 B3				-4.86	1.00	^ × × × ×	Loose to medium dense black sandy slightly silty subrounded fine to	1.0 —
1.00 - 1.45	SPT (S) N=9	1.00	Dry	N=9 (1,2/2,2,2,3)		[	× × ×	coarse GRAVEL. Sand is fine to coarse.	
	ES29					Ē	×. ×. ×		1.5 —
2.00	D4					(1.80)	×·×·×		-
2.00 - 2.45	SPT (S)	2.00	Dry	N=12 (2,2/3,3,3,3)		E	× × ×		2.0
	N=12 ES30					<u> </u>	× × ×		2.5
	B5				-6.66	2.80	×		
	D6				-0.00	2.80		Medium dense greyish brown very gravelly slightly silty fine to coarse SAND. Gravel is subrounded fine.	3.0
	SPT (S) N=14	3.00	Dry	N=14 (2,3/4,4,3,3)					-
3.50	ES31								3.5
3.50 - 4.50	B7					(1.70)			-
	D8	4.00	D	N 40 /2 2/4 4 5 5\		-			4.0
	SPT (S) N=18	4.00	Dry	N=18 (3,3/4,4,5,5)		[			-
	ES32 B9				-8.36	4.50 (0.30)	× × × >	Firm brown slightly sandy slightly gravelly SILT. Sand is fine to coarse.	4.5
4.80 - 5.50	B10				-8.66	4.80	×××	Gravel is subrounded fine.  Medium dense brown very sandy slightly silty subrounded fine to medium	-
	SPT (S) N=12	5.00	Dry	N=12 (1,2/2,3,3,4)		-	×	GRAVEL. Sand is fine to coarse. Locally thin bands of brown silt.	5.0
						(1.10)	^`		
	ES33					Ē	×××		5.5 —
	B11 UT34	6.00	Dry	Ublow=37 100%	-9.76	5.90	××.×	Very stiff greyish brown slightly sandy slightly gravelly SILT. Sand is fine to	- - 6.0
0.00 - 0.43	0134	0.00	Ыу	Oblow-37 100%		E	× × × × × × × × × × × × × × × × × × ×	coarse. Gravel is subrounded fine to medium.	-
6.50	D12					Ē	^ ^ ^ ^ × × × >		6.5
						(1.70)	` × × × × × × >		
	D13					- '	× × × × × × >		7.0 —
	SPT (S) N=8	7.00	Dry	N=8 (1,2/2,2,2,2)		Ē	× × × × ×		
	B14				-11.46	7.60	$\times \times $		7.5
7.00 3.00	214				-11.40	7.00	× × × > × × ×	Firm brownish grey slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is subrounded fine.	
8.00 - 8.45	UT35	8.00	Dry	Ublow=59 100%		[ (1 10)	$\times \times $		8.0 —
						(1.10)	× × × >		
	D15				13.50	0.70	^ ^ ^ / ` × × × >		8.5 —
	B16				-12.56	8.70	×××	Medium dense brownish grey very silty fine to coarse SAND.	
	D17 SPT (S)	9.00	Dry	N=12 (1,1/2,3,3,4)		-	× × × × ×		9.0 —
	N=12					(1.40)	× × ×		
						-	× × × ×		9.5 —
10.00 - 10.35	UT36	10.0	Dry	Ublow=61 80%		-	××××		10.0 —
	B18	0	_ · y	25.001 00/0	-13.96	10.10 (0.40)	$\times \times \times$	Soft grey slightly sandy SILT. Sand is fine to coarse.	
						·	× .× .× .×		
<b>Remarks</b> Deck to Bed = 6.2	20m							Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (m) Time (hh:mm)
								SK6L 13.60	14.00 01:00
								Flush Type Water Added Casing Details From (m) To (m) To (m) Dolam (mm)	
Terminated at sch	odulod	den+	h					tod tod to tod to tod to tod to tod tod	

20						Project		_		Borehole No.:
<b>1</b>	CAL	JS	E	<b>VAY</b> TECH		17-016		Arklow Client:	Sewerage Scheme Marine Outfall GI	BH01
		— C	EC	TECH		325103		Irish W	ater	Sheet 2 of 3
Method	Pla	nt U	sed	Тор Ва	se					<b>Scale:</b> 1:50
Cable Percussion Rotary Drilling		ndo 3	000	0.00 20.	JU	173070	D.75 N	Byrne	ooby ARUP J.V.	<b>Driller:</b> CC+TA
Kotary Drilling	Com	acciii	0 403	20.30 23.	00	Ground		Dates:		Logger: SG
Depth	Sample /	/ Casing	Water	5.110 1		-3.86	Depth (m)			
(m) 10.50	Tests D19	Depth (m)	Water Depth (m)	Field Records	·	(mOD) -14.36	(Thickness)	Legend ×××>	Description  Soft grey slightly sandy SILT. Sand is fine to coarse.	Backfill
10.50 - 12.00	B20					14.50	10.50	×××	Medium dense grey very silty fine to coarse SAND with thin bands of greyish brown silt.	10.5 —
11.00 - 11.45	SPT (S)	11.0	Dry	N=13 (1,2/3,3,3,4	,			x	greyish brown she.	-110
11.00 - 11.43	N=13	0	Diy	N-13 (1,2/3,3,3,-	,			× × ·		
							(0.00)	× × × × ×		11.5
							(2.20)	× × × ×		=
12.00 - 12.45	SPT (S)	12.0	Dry	N=12 (2,3/3,3,3,3	)		<u>:</u>	× × × ×		12.0
	N=12	U						× × ×		-
12.70 - 13.50	B21					-16.56	12.70	× × × × ×		12.5
13.00 - 13.45	SPT (S)	100	ווייייייייייייייייייייייייייייייייייייי	N=21 (1,2/4,5,5,7	,	10.30	_ 12.70	`	Medium dense to dense greyish brown very sandy silty subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse.	
13.00 - 13.43	N=21	0	y Joiny	114-21 (1,2/4,3,3,7	'			× × ×		-
								× × ×		13.5
								×·× ·×		
14.00	D22						_	× × ×		14.0
14.00 - 15.00 14.00 - 14.45	B23 SPT (S)		Dry	N=28 (3,4/6,6,7,9	)			`		-
	N=28	0						××××		14.5 —
							(4.30)	×. ×. ×		-
15.00 15.00 - 16.00	D24 B25							×·×·×		15.0
15.00 - 15.45	SPT (S) N=31	15.0 0	Dry	N=31 (6,7/9,7,7,8	3)			× × × × × × × × × × × × × × × × × × ×		15.5
								× × × ×		=
16.00 - 17.00	B26						_	*		16.0
16.00 - 16.45	SPT (S) N=31	16.0	Dry	N=31 (4,6/7,8,8,8	5)			× × ×		-
								×·×·×		16.5 —
	(-)							×		
17.00 - 17.45	SPT (S) N=26	17.0	Dry	N=26 (2,4/5,5,7,9	)	-20.86	17.00		Medium dense to dense brownish grey very sandy very silty subrounded fine to medium GRAVEL. Sand is fine to coarse.	17.0 —
17.30 - 18.00	B37								The to mediam gravest same is the to course.	17.5
18.00	D38						- -			18.0
18.00 - 19.00 18.00 - 18.45	B39 SPT (S)		Dry	N=18 (2,3/4,4,5,5	5)					
	N=18	0								18.5
							(3.50)			
19.00 19.00 - 20.00	D40 B41									19.0
19.00 - 19.45	SPT (S) N=32	19.0 0	Dry	N=32 (3,4/7,8,9,8	3)					19.5
20.00	D42									20.0
20.00 - 20.45	SPT (S) N=29	20.0 0	Dry	N=29 (2,3/5,7,8,9	)		-			
20.20 - 20.50	B27					-24.36	20.50	×××	Very dense greyish brown gravelly slightly silty fine to coarse SAND. Gravel	20.5
	TCR SCR	RQD	FI					V. A 1.V	W. C. C.	Ilina Ditti II
<b>Remarks</b> Deck to Bed = 6.2	20m								Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (m)   Time (hh:mm)   14.00   01:00
									SK6L 13.60	1
									Flush Type	
Terminated at sc	heduled	dept	:h						15.00 250	

0.0							Projec	t No.:	Projec	ct Name:							Bore	hole No.:
252		N.I.	ıc		A/AV		17-016	57	Arklow	w Sewerag	e Scheme	Marine	Outfall G	I				BH01
$-\Box$		10	73		WAY TECH		Coordi	nates:	Client	:							Sh	eet 3 of 3
			G	LC	ЛЕСП		32510	3.16 E	Irish W	Vater							311	eet 3 01 3
Method		Plan			Тор	Base	1		Client'	's Represe	entative:						Scale	<b>:</b> 1:50
Cable Percussion		Dano			0.00	20.50	17307	0.75 N	Byrne	Looby AR	UP J.V.						Deille	er: CC+TA
Rotary Drilling	C	oma	cchic	405	20.50	25.00	Groun	d Level:	Dates:	:							Dilli	er: CC+IA
							-3.8			/2017 - 05	5/09/2017						Logg	er: SG
Depth (m)	TCR	SCR	RQD	FI	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend	1			Description	1			Water	ackfill
(111)							(IIIOD)	(Tilless)	×××	is subrour	nded fine to r	medium.					>	
21.00 - 21.45					N=50 (6,6/7,13,1-	4,16)												21.0
23.00 - 23.40					N=50 (6,7/5 250mm)	50 for		(4.50)										23.0 ————————————————————————————————————
25.00 - 25.34					50 (6,9/50 1	for	-28.86	25.00	××××									25.0
23.00 - 23.34					185mm)	Ю	-28.80	25.00				End of B	orehole at	25.00m				25.0
																		25.5 — —
								F										26.0 —
								Ē										
								-										26.5
																		27.0 -
								F										27.0 —
																		27.5 —
								Ē										-
																		28.0 —
																		28.5 —
								-										29.0 —
								[										
								<u> </u>										29.5 —
								Ė										
								-										30.0
								[										
								E										30.5
								<u> </u>										
								-										31.0 -
	TCR	SCR	RQD	FI									141	Cau!les -				Dotoi!-
Remarks Deck to Bed = 6.2	20m										Core Barrel	Struck at (m)		Strikes Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)
											SK6L					13.60	14.00	01:00
											Flush Type		Added		g Details	]		
										] '	ype	From (m)	To (m)	To (m) 24.80	Diam (mm) 200	-		
Terminated at schedu	uled d	epth																

						Project		-	t Name:				Borehol	
S C C	CAL	JS	E	<b>VAY</b>		17-016 Coordi		Arklow Client:	Sewerage Scheme	iviarine Outfall G	II .		ВН	U2
		— C	EO	TECH		32514		Irish W					Sheet	1 of 3
Method	Pla	nt U	sed	Тор	Base			Client'	s Representative:				Scale:	1:50
Cable Percussion	n Dan	ndo 3	000	0.00	18.00	17309	4.73 N	Byrne	Looby ARUP J.V.				Driller:	CCTSS
Rotary Drilling	Coma	acchi	o 405	18.00	25.00	Ground	l Level:	Dates:						
							3 mOD		2017 - 31/08/2017				Logger:	SG
(m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	cords	Level (mOD)	Depth (m) (Thickness)	Legend		Description			Nackt	fill
0.00 - 1.00	B1							× × ×	Black very sandy slightl GRAVEL. Sand is fine to		o rounded fine	to coarse		
0.50	ES28						(1.00)	××××						0.5 -
								× × ×						
1.00	D14					-2.28	1.00	× 2/1/2 × 2	C-ft black diababases	.ll		C	_	1.0 —
1.00 - 2.00 1.00 - 1.45	B2 SPT (S)	1.00		N=8 (1,2/2,	2 2 2)			× 9/0 × >	Soft black slightly grave to coarse. Gravel is sub					
	N=8	1.00		14-0 (1,2/2,	۷,۷,۷			$\times$ $\times$ $\times$ $\times$ $\times$ $\times$						1.5 -
1.50	ES29						(1.30)	× 4/6× ×						
2.00	D15							×*/(** >						2.0 —
2.00 - 2.45	SPT (S) N=5	2.00		N=5 (1,1/1,	1,1,2)	-3.58	2.30	× 2/0 × 3	Loose black very sandy	aliabely siles 1	adad to '	d fina t		
2.30 - 3.00 2.50	B3 ES30							× × × ×	GRAVEL. Sand is fine to		nueu to rounde	eu iiiie to coarse		2.5 -
3 <del>-</del>								× × ×						
3.00 3.00 - 4.00	D16 B4						_	×. ×. ×						3.0 —
	SPT (S)	3.00		N=8 (1,2/1,2	2,2,3)			× × ×						
3.50	N=8 ES31						(2.60)	×· × ×						3.5 -
								× × ×						
1.00 1.00 - 4.45	D17 SPT (S)	4.00		N=10 (1,1/2	2,2,3,3)			××××						4.0 —
	N=10							×						
4.50	ES32							× × ×						4.5 -
4.90 - 6.00	B5					-6.18	4.90	î::'×	Firm brown CLAY.				_	5.0 —
5.00 - 5.45	UT24			Ublow=76 1	100%									3.0
5.50	ES33						(1.10)							5.5 -
									_					
6.00	D18					-7.28	6.00		Medium dense brown	very candy cilty cuba	ungular to subre	ounded fine to	_	6.0 —
6.00 - 6.40 6.00 - 6.45	B6 SPT (S)	6.00		N=15 (1,2/3	3.3.4.5)		(0.60)		medium GRAVEL. Sand		ingular to subit	Junaeu IIIIe to		
6.40 - 7.00	N=15 B7			- ( ) / -	,-, ,-,	-7.88	6.60							6.5 -
3.40 - 7.00	67						(0.30)		Firm to stiff brown CLA	Υ.				
7.00 - 7.45	UT25			Ublow=65 1	100%	-8.18	6.90		Firm brownish grey slig	htly sandy CLAY. San	d is fine to med	dium.		7.0 —
7.00 - 8.00	B8													
7.50	D19													7.5 -
							(2.10)							
8.00 - 8.45	SPT (S) N=7	8.00		N=7 (2,1/2,	1,2,2)		(2.10)		-					8.0 —
								ĦĪ						
														8.5 -
9.00 - 10.00	В9					-10.28	9.00							۵0.
9.00 - 10.00	UT26			Ublow=30 0	)%	10.20	3.00	^x	Grey silty fine SAND.					3.0 T
							(0.80)	××× ×××						9.5 -
						-11.08	9.80	××××						
10.00 - 11.00	B10					11.00	- 7.00		Firm brownish grey slig	htly sandy CLAY. San	d is fine to med	dium.		10.0 —
10.00 - 10.45	SPT (S) N=8	10.0 0		N=8 (1,2/2,	2,2,2)									
Domes -les										Mata	Strikes	Ch:	selling Deta	aile
<b>Remarks</b> Deck to bed = 5.3	30m								Core Barrel	Struck at (m) Casing to (m)		se to (m) From (m) 11.00		Time (hh:mm 01:00
									Flush Type	Water Added From (m) To (m)	Casing Det	tails		
erminated at sc	hadulad	dent	h							2.50 15.00				

200					\	Project			t Name:		0 10 11 0					ole No.
C C C C C C C C C C C C C C C C C C C	CAL	JS	E	<b>YAY</b>		17-016 <b>Coordi</b>		Client:	Sewerage Scheme	iviarine	Outrail G				-	3H02
		—G	EΟ	TECH		32514		Irish W							Shee	et 2 of 3
Method	Pla	nt U	sed	Тор	Base	1		Client'	s Representative:						Scale:	1:50
Cable Percussion Rotary Drilling	n Dar Coma	ndo 3		0.00 18.00	18.00 25.00	17309	4.73 N	Byrne	Looby ARUP J.V.						Drille	r: CC+S:
Notary Drilling	Come	acciiii	0 403	18.00	25.00		d Level:	Dates:							-	
Depth	Sample /	/ Casing	Water			-1.28 Level	B mOD  Depth (m)		<sup>(</sup> 2017 - 31/08/2017						Logge	
(m) 10.50	Tests D20	Depth (m)	Water Depth (m)	Field Re	ecords	(mOD)	(Thickness)	Legend	Firm brownish grey slig		Description		medium		Mater Ba	ckfill
10.50 - 10.95	UT27			Ublow=59 1	L00%		-		- Time Stownish grey sing	sirely suriu	y CEATH. Suit	u 15 11110 to	, mealain.			10.5
11.00	D21						(1.70)									11.0 -
11.00	SPT (S)	11.0		N=15 (2,2/3	3,3,3,6)				_							
11.50 - 12.50	N=15 B11	0				-12.78	11.50				-11.			16	_	11.5
								4 9	Medium dense brown coarse GRAVEL with lo	w cobble	and boulde	r content.	Sand is fin			
12.00 - 12.45	SPT (S)	12.0		N=23 (3,4/6	5,5,6,6)		-		coarse. Cobbles and bo	oulders are	e subround	led to rour	nded.			12.0 -
	N=23	0						a , a ,								
							(2.25)	a ' c '								12.5
							[									
13.00 - 14.00 13.00 - 13.45	B12 SPT (S)	13.0		N=24 (2,4/5	5,6,6,7)		<u>-</u>	a 'a '								13.0 -
	N=24	0														13.5
						-15.02	13.75	9 9								13.5
14.00	D22						-55	000	Dense brown sandy su medium cobble and bo	oulder con	tent. Sand					14.0 -
14.00 - 15.00 14.00 - 14.45	B13 SPT (S)	14.0		N=39 (4,6/7	7 9 10 13)			000	boulders are subangul	ar to subr	ounded.					
	N=39	0		( ,,,,	,-,,,		-	000								14.5
								000								
15.00 15.00 - 16.00	D23 B35							0.0								15.0 -
15.00 - 15.45	SPT (S) N=34	15.0 0		N=34 (6,9/7	7,8,8,11)		(3.15)									
	N=34	0														15.5
16.00	D34							000								16.0 -
16.00 - 16.45	SPT (S) N=34			N=34 (4,6/7	7,9,8,10)											
	11-34							0 0								16.5
16.90 - 17.50 17.00	B37 D36					-18.18	16.90	× × × × × ×	Dense grey sandy silty Sand is fine to coarse.	subangula	ar to subro	unded fine	to coarse	GRAVEL.		17.0 -
17.00 - 17.45	SPT (S) N=32	17.0 0		N=32 (4,6/7	7,7,8,10)		(4.40)	× × ×	Suria is time to course.							
							(1.10)	× × ×								17.5
10.00 40.05	CDT (C)	10.5		F0 /25 5 -	Fm /F 2		40.00	^								
18:88 <del>-</del> 18:85	SPT (C)	18.0 0		50 (25 for 2 for 25 mm) for 25 mm)	355 SHIM/30	-19.27	18.00 (0.40)	0,0,	Amphibolite BOULDER							18.0 -
	40			,		-19.68	18.40		Grey sandy silty suban	gular to sı	ubrounded	fine to coa	arse GRAVI	L with low		18.5
							<u> </u>	°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°°	cobble content. Sand is subrounded predomin				bangular t	0		
19.00 - 19.45				N=35 (5,6/8	3,8,9,10)			, o		•						19.0 -
19.00																
							-	0 0								19.5
					_			9 9								
20.00 - 20.45				N=38 (5,7/9	9,8,10,11)											20.0 -
								a . ° å . j								20.5
	TCR SCR	POD	FI				-									20.5
Remarks	ICK SUR	י רעט	ri .			<u> </u>	<u> </u>		Core Barrel			Strikes	L		elling D	
eck to bed = 5.	30m								20.0 20.101	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m) 11.00	To (m) 12.80	01:00
										Water	r Added	Casing	g Details	-		
									Flush Type	From (m)	To (m)	To (m) 16.50	Diam (mm) 250			
erminated at sc	heduled	dept	h									18.00	200			

							Project	: No.:	Project	t Name:	Boreh	ole No.:
A A		ΛI	IC		M/AV		17-016	7	Arklow	Sewerage Scheme Marine Outfall GI	В	3H02
+0		70	_ C	FC	WAY TECH		Coordi		Client:		She	et 3 of 3
					712011		32514	7.00 L	Irish W			
Method			nt U		Тор	Base	17309	1 72 NI		s Representative:	Scale:	1:50
Cable Percussion Rotary Drilling			do 3	000 o 405	0.00 5 18.00	18.00 25.00			-	Looby ARUP J.V.	Drille	r: CC+SS
					20.00	25.00			Dates:			
Depth							-1.28	B mOD  Depth (m)	29/08/	2017 - 31/08/2017 I	Logge	r: 3G
(m)	TCR	SCR	RQD	FI	Field Re	cords	(mOD)	(Thickness)	Legend	Description	>	ckfill
										Grey sandy silty subangular to subrounded fine to coarse GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subangular to	<b>'</b>	
21.00 - 21.45					N=43 (6,6/10,11,1	10,12)				subrounded predominantly of amphibolite.		21.0
												21.5
									9 9 0			
22.00 - 22.45	0				N=42 (6,7/10,10,1	11.11)		(5.10)				22.0 —
					( , , , , , ,	, ,		-				
								-				22.5 —
									9 9 0			
23.00 - 23.45					N=48 (7,7/11,12,1	13.12)		F	9 9 9			23.0 —
						-,,		<b>E</b>	9 9 9			
23.50							-24.78	23.50		Medium strong to strong dark bluish grey AMPHIBOLITE recovered as		23.5 —
								Ę		subangular to subrounded fine to coarse GRAVEL and subrounded to rounded cobbles.		
								<u> </u>				24.0 —
	80							(1.50)				
												24.5 —
25.00 - 25.26 25.00				1	50 (12,21/5 110mm)	0 for	-26.28	25.00		End of Borehole at 25.00m		25.0 —
25.00					110,							
												25.5 —
												]
								-				26.0 —
												26.5 —
								_				27.0 —
								-				27.5 —
								-				28.0 —
								Ē				
								-				28.5 —
								-				
								-				29.0 —
								Ē				
								<u> </u>				29.5 —
								_				30.0 —
								Ė				
								Ė				30.5
	TCP	SCR	RQD	FI				-				31.0
Remarks	. 511	JUN		ı <u>.</u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>		iselling D	
Deck to bed = 5.3	30m									Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   11.00	To (m) 12.80	Time (hh:mm) 01:00
										Was stated 5 to 5 to 5		
										Flush Type Water Added Casing Details From (m) To (m) To (m) Diam (mm)  Diam (mm)		
Terminated at schedu	uled o	depth										

20					\	Project			t Name:	Во	reho		o.:
	CAL	JS	E\	<b>VAY</b>		17-016			v Sewerage Scheme Marine Outfall GI		ВН	111	
		—C	EO	TECH		Coordi		Client: Irish W		S	Sheet	1 of	2
Method	Pla	nt U	sed	Тор	Base	32473	0.75 E		's Representative:	Sc	ale:	1:50	 ე
Cable Percussio		ndo 3		0.00	10.70	17345	2.99 N		Looby ARUP J.V.	Dr	iller:	ΔΗ	
							d Level:	Dates:					
Depth	Sample /	Casing Depth	Water			-0.3.	3 mOD  Depth (m)	02/11/		┿	gger:	<u>'                                    </u>	
(m)	Tests	Depth (m)	Depth (m)	Field Re	ecords	(mOD)	(Thickness)	Legend	Description  Medium dense grey very sandy slightly silty subangular to subrounded fine	Water	Back	.till	
							-	× × ×	to coarse GRAVEL. Sand is fine to coarse.				-
0.50	D1							×××				0.9	.5 -
0.80 - 1.20	ES11 B19						-	×·^·×	▼	_			
1.00 - 1.45	SPT (S)			N=14 (3,3/3	3,4,3,4)		-	×				1.0	.0 —
	N=14						-	×					
1.50	D2							× ×				1.	.5 -
1.80 - 2.20	ES12 B20						-	×					
2.00 - 2.45	SPT (C)			N=19 (3,4/5	5,5,4,5)		(4.00)	× ×				2.0	.0 —
	N=19						-	( × × )					
2.50	D3						<u> </u>	(				2.!	.5 -
2.80 - 3.20	ES13 B21						-	× × ×					
3.00 - 3.45	SPT (C)			N=20 (4,5/5	5,5,4,6)		-	×××				3.0	.0 —
	N=20							×××					
3.50	D4						-	× × ×				3.5	.5 –
3.80 - 4.20	ES14 B22							× × ×					
4.00 - 4.45	SPT (C)			N=30 (5,6/7	7,8,7,8)	-4.33	4.00	××	Medium dense grey sandy subangular to subrounded fine to coarse			4.0	.0 —
	N=30							å .	GRAVEL with low cobble content. Sand is medium to coarse. Cobbles are				-
4.50	D5						-	9 9	subangular to subrounded of mixed lithologies.			4.	.5 –
4.80 - 5.20	ES15 B23						(1.40)	å ° ¢					-
5.00 - 5.45	SPT (C)			N=23 (4,6/6	5,5,6,6)		-	, o .				5.0	.0 —
	N=23							å å	: 0 3				-
5.50	D6					-5.73	- 5.40 -		Stiff grey slightly sandy slightly gravelly CLAY . Sand is fine to coarse. Gravel	1		5.	.5 —
5.80 - 6.20	ES16 B24								is subangular to subrounded fine.				-
6.00 - 6.50	U17			Ublow=40 9	98%		(1.10)					6.0	.0 —
													-
6.50	D7					-6.83	- - 6.50	<del>-</del>	Stiff grey slightly sandy slightly silty CLAY . Sand is fine to coarse.	-		6.	.5 —
6.80 - 7.20	B25							<u> </u>	Jun grey anguly annuy anguly anty CLAT . adult is title to codise.				-
7.00 - 7.45	SPT (S)			N=27 (5,6/6	5,7,6,8)		-	×_×_	:] 			7.0	.0 —
	N=27						-	<u>×</u> _×	: 1				-
7.50	D8						-	<u>×</u>				7.!	.5 –
7.80 - 8.20	B26						_	<u>×</u>					
8.00 - 8.50	U18			Ublow=38 9	97%		(3.10)	×				8.0	.0 —
							(3.10)	×					
8.50	D9						-	××				8.	.5 –
8.80 - 9.20	B27						-	×^-					-
9.00 - 9.45	SPT (S)			N=27 (5,7/6	5,6,7,8)		-	×_^_	4			9.0	.0 —
	N=27							X	4 4 4 1				-
9.50	D10					0.55		×				9.	.5 —
9.80 - 10.20	B28					-9.93	9.60	å , °	Dense grey sandy slightly silty subangular to subrounded fine to coarse GRAVEL with low cobble and boulder content. Sand is fine to coarse.	Ť			-
20.20		-					-		S	$\vdash$			_
Remarks	1	1				I	I	I			ng Det	ails	
Drilled from floa	ating platf	orm							Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   9.60   9.60   20   0.80   0.80   10.50	0	.90 0.70	00:30 01:00	30
									Water Added Casing Details				
									From (m)   To (m)   To (m)   Diam (mm)				
Terminated at re	efusal on	large	boul	der									

						Projec	t No.:	Projec	t Name:						Во	reho	le No.:
	CAL	IS	E	WAY		17-016		Arklow	Sewerage Scheme	Marine (	Outfall G	I				ВН	111
		−G	EO	TECH		Coordi	nates:	Client:				<u></u>			S	heet	2 of 2
P. C. 1. 1		71				32473	0.75 E	Irish W									
Method Cable Percussio		nt Us do 30		<b>Top</b> 0.00	<b>Base</b> 10.70	17345	2.99 N		s Representative: Looby ARUP J.V.								1:50
						Ground	d Level:	Dates:							Dri	ller:	АН
							3 mOD	02/11/							Log	gger:	LN
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend		D	escription	ı			Water	Back	fill
10.00 - 10.45	SPT (S)	(,	()	N=49	42.45\	(IIIOD)	-		Cobbles and boulders a	are subrou	nded to ro	unded of n	nixed lithol	ogies.	Ĺ		<u> </u>
	N=49			(8,9/10,12,	12,15)		(1.10)	9	,								
						-11.03	- - 10.70	9 9	9								10.5 —
						11.03	- 10.70			End of Bo	rehole at	10.70m					
							-										11.0 —
							-										11.5
																	11.5 —
							Ŀ										12.0
							-										-
							<u> </u>										12.5
							-										-
							-										13.0
							-										
																	13.5 —
							-										
							-										14.0 —
							-										14.5 —
							-										
							Ė										15.0 —
							-										_
							-										15.5
							-										
							-										16.0
							-										-
							-										16.5
							-										17.0
							-										
							Ė										17.5 —
							-										
							-										18.0 —
							-										
							-										18.5 —
							-										-
							-										19.0 —
							<u> </u>										19.5
							_										12.5
							-										
Remarks											Water	Strikes		Chis	ellin	g Deta	ails
Drilled from floa	iting platfo	orm								Struck at (m)	Casing to (m)		Rose to (m)	From (m) 0.80	To 0.	(m) 90	Time (hh:mm) 00:30
														10.50	10	.70	01:00
										Water From (m)	Added To (m)	To (m)	Details Diam (mm)				
Terminated at re	efusal on I	arge	boul	der								10.70	200				

202					\	Project			t Name:	Во		e No.:
KQK1	CAL	JS	E	VΔY		17-016			sewerage Scheme Marine Outfall GI		BH:	12
		<u> </u>	GEO	<b>VAY</b> TECH		Coordi	nates:	Client:		S	heet	1 of 2
						32482	1.38 E	Irish W		-		1.50
Method Cable Percussion			sed 3000	<b>Top</b> 0.00	<b>Base</b> 10.50	173389	9.74 N		s Representative: Looby ARUP J.V.		ale:	
Cable Ferensia.			,,,,,	0.00	20.50	Ground	d Level:	Dates:		Dri	iller:	CC
							B mOD	24/08/		Log	gger:	SG
Depth	Sample /	Depti	g Water Depth	Field Re	ecords	Level	Depth (m)	Logond		Water	Backf	fill
(m) 0.00 - 1.00	Tests B1	(m)	(m)			(mOD)	(Thickness)		Medium dense brown very sandy slightly silty subangular to subrounded	>		N.
									fine to medium GRAVEL. Sand is fine to coarse.			
0.50	ES21						(1.30)					0.5 -
							(1.30)					
1.00 1.00 - 1.45	D10 SPT (S)	1.00		N-15 /2 2/3	2 1 1 1)		-					1.0 —
	N=15	1.00		N=15 (2,3/3	5,4,4,4)	-2.18	1.30		Medium dense brown sandy slightly silty subangular to subrounded fine to	-		
1.30 - 2.00 1.50	B2 ES22						-		medium GRAVEL. Sand is fine to coarse.			1.5 -
							(1.00)					
2.00	D11	2.00										2.0 —
2.00 - 2.45	SPT (S) N=11	2.00		N=11 (1,1/2	۷,3,3,3)	-3.18	- - 2.30		Firm to stiff grey slightly sandy CLAY. Sand is fine to coarse.			
2.30 - 3.00 2.50	B3 ES23						- -		The control of the state of the control of the cont			2.5 -
							-					
3.00 - 3.45	UT18			Ublow=89	100%		-					3.0 —
3.00 - 4.00	B4						<u>-</u> -					
3.50	D12											3.5 -
	ES24						_					
4.00	D13						-					4.0 —
4.00 - 5.00 4.00 - 4.45	B5 SPT (S)	4.00		N=37 (5,6/7	7,8,9,13)		- - -					
4.50	N=37 ES25			. , ,			- -					4.5 -
4.50	E323						- - -					
5.00 - 5.45	UT19			Ublow=83	100%		-					5.0 —
5.50	D14						(6.10)					5.5 -
5.50 - 6.50	ES26 B6						- -					
3.30 0.30							-					6.0 —
							-					
6.50	D15						-					6.5
6.50 - 6.95	SPT (S) N=32	6.50		N=32 (5,4/6	5,8,8,10)		<u> </u>					
7.00 - 8.00	N=32 B7						_					7.0 —
							<u>-</u>					
							-					7.5 -
							_					
8.00 - 8.45	UT20			Ublow=61	100%		-					8.0 —
							<del> </del>  -					
8.40 - 9.50	B8					-9.28	8.40	. ·×	Brown sandy silty subangular to subrounded fine GRAVEL. Sand is fine to			8.5 -
8.50	D16						-	× × × ×	coarse.			
							(1.10)	× × ×				9.0 —
							-	×××				
9.50	D17					-10.38	- - - 9.50	×××				9.5 -
9.50 - 10.50	В9					10.30	(1.00)		Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium.			
9.50 - 9.95	SPT (S) N=11	9.50	)	N=11 (2,2/2	2,3,3,3)		- (1.00)					
Domonica									Water Strikes Chis	ellin	g Deta	ils
<b>Remarks</b> Deck to Bed = 2.0	60m								Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)			Time (hh:mm
									Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
Terminated at sc	:heduled	dent	th						1.50 9.50			
		ωcρ									ightharpoonup	

Concinents							Projec	t No.:	Projec	Name:						Во	reho	le No.:
Table   Tabl	ROR	CAL	IS	E	WAY						Marine (	Outfall G					ВН	112
Method   Plant Used   Top   Base   248231.8     Client's Representative:   Springer Loby ARUP JV.   Springer Loby ARUP			−G	EC	TECH											S	heet	2 of 2
Companies   Disease   Section   Disease   Di			A				32482	1.38 E										1.50
Company   Comp							17338	9.74 N										
Company   Comp							Groun	d Level:								Dri	ller:	CC
Tendence   Peter   P																Log	gger:	SG
11.38   10.50	Depth (m)		Casing Depth (m)	Water Depth (m)	Field Re	cords		Depth (m)	Legend		D	escription				Water	Back	fill
Lind of boversion at 15-50m							(	-		Firm brown slightly san	idy slightly	gravelly Cl	AY. Sand is	fine to co	arse.			
Lind of boversion at 15-50m							44.20	10.50		Graver is subangular to	Subiounia	d fille to f	neurum.					_
Note							-11.38	- 10.50			End of Bo	rehole at	10.50m					10.5
Note								-										11.0
120   120								-										-
120   120																		11.5
120 -   120								-										-
								[										12.0
								-										
								-										12.5
								-										
Mater   Strikes   Chise  Ing Details   Street   Strikes   Chise  Ing Details   Street   Strikes   Strike								-										13.0
Mater   Strikes   Chise  Ing Details   Street   Strikes   Chise  Ing Details   Street   Strikes   Strike								-										
National Content of Transport   Transpor								-										13.5
National Content of Transport   Transpor								-										
Nemarks   Water Strikes   Chise ling Details   Section   Total								-										14.0
Nemarks   Water Strikes   Chise ling Details   Section   Total								-										-
18.0								-										14.5 —
18.0								-										
16.0 -   1								-										15.0 —
16.0 -   1																		
15.5 -   1								-										15.5 —
15.5 -   1								-										-
Remarks Peck to Bed = 2.60m    To -																		16.0
Remarks Peck to Bed = 2.60m    To -								-										-
12.5								-										10.5
12.5								-										17.0
18.0								Ė										-
18.0								-										17.5
Water Strikes   Chiselling Details								-										
Water Strikes   Chiselling Details   Struck at (m)   To (m)   Time (min)   Rose to (m)   From (m)   To (m)   Time (min)   Time (m								-										18.0 —
Water Strikes   Chiselling Details   Struck at (m)   To (m)   Time (min)   Rose to (m)   From (m)   To (m)   Time (min)   Time (m								-										
Water Strikes   Chiselling Details								-										18.5 —
Water Strikes   Chiselling Details								-										
Water Strikes   Chiselling Details								-										19.0
Water Strikes   Chiselling Details								-										-
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   To (m)   Time (hhzmm)								-										19.5
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   To (m)   Time (hhzmm)								<u> </u>										
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   To (m)   Time (hhzmm)																		
Water Added   Casing Details	<b>Remarks</b> Deck to Bed = 2.6	60m									Struck at (m)			Rose to (m)				
From (m) To (m) To (m) Diam (mm) 10.50 200	Sou 2.0	***																
10.50 200																		
	Terminated at sch	neduled	dept	h							(11)	- 11		200				

2021						Project		-	t Name:	Во		e No.:
<b>**</b>	CAL	JSE	ΞV	<b>VAY</b> TECH		17-016			/ Sewerage Scheme Marine Outfall GI		BH1	13
		-GE	0	TECH		Coordi		Client: Irish W		S	heet í	1 of 2
Method	Dla	nt Use	,d	Тор	Base	32483	7.57 E		s Representative:	Sca	ale:	1.50
Cable Percussion		ido 300		0.00	10.50	17335	7.32 N		Looby ARUP J.V.	-		
						Ground	d Level:	Dates:		Dri	iller:	CC
							5 mOD	23/08/		Log	gger:	SG
Depth (m)	Sample / Tests	Depth D	Vater epth (m)	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfi	fill
0.00 - 1.00	B1	()	()			(02)	-		Medium dense brown sandy slightly silty subangular to subrounded fine			
							[		GRAVEL. Sand is fine to coarse.			
0.50	ES20						-					0.5 -
							(1.60)					
1.00 1.00 - 1.45	D9 SPT (S)	1.00		N=17 (2,3/4	4,4,4,5)		-					1.0 —
	N=17											
1.50 1.60 - 2.00	ES21 B2					-2.55	1.60	2 29	Medium dense brown very sandy slightly silty subangular to subrounded			1.5 -
									fine to medium GRAVEL with low cobble content. Sand is fine to coarse.			
2.00 2.00 - 2.45	D10 SPT (S)	2.00		N=23 (3,4/5	5,6,6,6)		-	9 9	Cobbles are subrounded.			2.0 —
	N=23			. , , -			(1.30)	9 9				
2.50	ES22						<u> </u>	9 9				2.5 -
2.90 - 4.00	B3					-3.85	2.90		Chiff group clightly conduct AV Cond in Son to account	$\perp$		
3.00 - 3.45	UT17			Ublow=86 1	100%		<u> </u>		Stiff grey slightly sandy CLAY. Sand is fine to coarse.			3.0 —
							-					
3.50	D11 ES23						Ė					3.5 -
							-					
4.00 4.00 - 5.00	D12 B4						_					4.0 —
4.00 - 4.45	SPT (S) N=43	4.00		N=43 (5,5/8	8,8,12,15)		-					
4.50	ES24											4.5 -
							(4.10)					
5.00 - 5.45	UT18			Ublow=83 1	100%		(4.10)					5.0 —
	D4.2						-					
5.50	D13 ES25											5.5 -
5.50 - 6.50	B5						-					
							-					6.0 —
c 50							-					
6.50 6.50 - 6.95	D14 SPT (S)	6.50		N=37 (4,6/6	5,8,10,13)		[ -					6.5
7.00 - 9.00	N=37 B6					7.05	7.00					7.0 —
7.00 - 8.00	100					-7.95	- 7.00 -	===	Stiff grey CLAY.			7.0
							_		-			7.5 -
							-	<u> </u>				,.s -
8.00 - 8.45	UT19			Ublow=31 1	100%		(1.90)	<u> </u>				8.0 —
0.00 - 0.43	0113			⊃ы∪W-31 I	100/0		<u>,</u>	<u> </u>				3.5 <u> </u>
8.50	D15							<u> </u>				8.5 -
0.30	213						-	<u> </u>				0.5
8.90 - 9.40	В7					-9.85	8.90	\$ . * . *	Brown sandy silty subangular to subrounded fine to coarse GRAVEL. Sand	$\dashv$		9.0 —
							(0.50)	× × ×	is fine to coarse.			3.0
9.40 - 10.50	B8					-10.35	9.40	· · · · · · · · ·	Firm slightly sandy CLAY. Sand is fine to coarse.	-		9.5 –
9.50 9.50 - 9.95	D16 SPT (S)	9.50		N=10 (1,2/2	2,2,3,3)		(1.10)					
	N=10						· .					
Remarks									Water Strikes Ch	nisellin	g Deta	ils
Deck to Bed = 2.	50m								Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)			Fime (hh:mm)
									Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
Terminated at sc	heduled	denth							1.60 9.00			

Method   Plant Used   Top   Base   Cable Percussion   During 2000   0.00   1						X I	Projec	t No.:	Projec	t Name:					Во	reho	le No.:
Method   Plant Used   Top   Base   Cable Percussion   Darko 2000   000   200   2030	(KSK)	ΓΔΙ	IS	E	WA	<b>Y</b>					Marine (	Outfall G	I			ВН	113
Method   Plant Used   Top			_G	EC	TECH	-									S	heet	2 of 2
Gable Percussion   0.00							32483	7.57 E									1.50
Command   Comm							17335	7.32 N									
August   Company   Compa							Groun	d Level:							Dr	iller:	CC
11.45															Lo	gger:	SG
11.45	Depth (m)		Casing Depth (m)	Water Depth (m)	Field	Records		Depth (m)	Legend		D	escription	ı		Water	Back	fill
First of Browkide at \$4.5 dbm	(,		. ,	.,,			(52)	[		Firm slightly sandy CLA	Y. Sand is f	ine to coar	se.				
First of Browkide at \$4.5 dbm										- -							_
Remarks    Nate   September   Property   Pro							-11.45	10.50			End of Bo	orehole at	10.50m				10.5 —
Remarks    Nate   September   Property   Pro								-									-
Remarks  Rem								-									-
Remarks  Rem																	11.5
Remarks    Note Strike   Chical Ing Details   Chica								-									=
Remarks    Note Strike   Chical Ing Details   Chica																	12.0
								-									
								- -									12.5
No.								-									
National Part								-									13.0 —
National Part								- -									
According								-									13.5
According								-									-
1.5.   2.5.								_									14.0
1.5.   2.5.								-									
Remarks Deck to Bed = 2.50m    Mater Strikes   Chiefling Details   Transport   Rose (a)   T								-									14.5 —
Remarks Deck to Bed = 2.50m    Mater Strikes   Chiefling Details   Transport   Rose (a)   T								-									
16.0   16.0								-									15.0 —
16.0   16.0																	
16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   17.5 -   17.5 -   17.5 -   17.5 -   17.5 -   18.0 -   1								-									15.5 —
16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   16.5 -   17.5 -   17.5 -   17.5 -   17.5 -   17.5 -   18.0 -   1								-									
170 - 170																	16.0
170 - 170								-									
17.5   18.0   18.0   18.0   18.5								-									16.5
17.5   18.0   18.0   18.0   18.5								-									17.0
18.0 -   18.0 -   18.0 -   18.5 -   18.5 -   18.5 -   18.5 -   19.0 -   1								-									
18.0 -   18.0 -   18.0 -   18.5 -   18.5 -   18.5 -   18.5 -   19.0 -   1								-									17.5
Water Strikes   Chiselling Details   From (m)   Tom (min)   Rose to (m)   From (m)   Tom (m)   Time (phrum)								-									
19.0   19.0   19.0   19.5								-									18.0
19.0   19.0   19.0   19.5								-									
Water Strikes   Chiselling Details								-									18.5
Water Strikes   Chiselling Details								-									
Water Strikes   Chiselling Details								-									19.0
Water Strikes   Chiselling Details								-									
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   Tio (m)   Time (hhzmm)								-									19.5
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   Tio (m)   Time (hhzmm)								-									
Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)   Tio (m)   Time (hhzmm)																	
Water Added   Casing Details	Remarks	50m									Struck at (m)			Rose to (m)			
From (m) To (m) To (m) Diam (mm) 10.50 200	Dock to Dea - Z.c	,5111															
10.50 200																	
	Terminated at sch	heduled	dent	h							(III)	10 (11)		200			

						Projec	t No.:	Projec	t Name:	Вс	reho	le No	).:
XX	CAI	IC	F	WAY		17-016	57	Arklow	Sewerage Scheme Marine Outfall GI		ВН	14	
	CAC	_G	EC	TECH		Coordi	nates:	Client:			Sheet	1 of 2	2
						32490	1.92 E	Irish W					
Method Cable Percussion		nt Us		<b>Top</b> 0.00	<b>Base</b> 10.00	17330	7.18 N		s Representative:	Sc	ale:	1:50	)
Cable Percussion	Dali	iuo si	000	0.00	10.00				Looby ARUP J.V.	_Dr	iller:	CC	
							<b>d Level:</b> 5 mOD	<b>Dates:</b> 02/08/		Lo	gger:	SG	_
Depth	Sample /	Casing Depth	Water	Field Re		Level	Depth (m)			+-	Back		
(m) 0.00 - 0.90	Tests B1	(m)	Depth (m)	Field Ke	ecoras	(mOD)	(Thickness)	Legend	Description  Black very sandy silty subangular to subrounded fine to medium GRAVEL.	Water	Васк	пп	
).25	ES19							× × ×	Sand is fine to coarse.				
							(0.90)	× × ×				0.5	5 -
.75	ES20							× × ×					
.90 - 1.50 .00	B2 D11					-2.44	- 0.90 -	× ×	Medium dense black very sandy slightly silty subangular to subrounded			1.0	o –
.00 - 1.45	SPT (S)	1.00		N=15 (2,3/3	3,4,4,4)			× × ×	fine to coarse GRAVEL. Sand is fine to coarse.				
.25	N=15 ES21						-	× × ×				1.5	5 -
.75	ES22						(1.60)	× × ×					
.00	D12						-	× ^ ×				2.0	0 -
.00 - 2.50 .00 - 2.45	B3 SPT (S)	2.00		N=12 (1,2/3	3 3 3 31		-	×: ^; ×					
	N=12	2.00		11-12 (1,2/3	,,,,,,,,	-4.04	- 2.50	× ×	Cuff arough his condu CLAY Condu Service			2.5	5 -
.25 .50 - 3.00	ES23 B4						-		Stiff grey slightly sandy CLAY. Sand is fine to coarse.				
.75 .00 - 3.45	ES24 UT17			Ublow=83	100%		-					3.0	0 -
							-						
.50	D13						-					3.5	5 -
50 - 4.00	B5						-						
.00	D14											4.0	0 –
	ES25	4.00		N 27/6 6/7	7.0.40.42\		-						
.00 - 4.45	SPT (S) N=37	4.00		N=37 (6,6/7	7,8,10,12)							4.5	5 -
.50 - 5.00	В6						-						
.00	ES26											5.0	o –
.00 - 5.45	UT18			Ublow=81	100%		(5.20)						-
.50	D15						-					5.5	5 -
.50 - 6.00	B7						-						-
							-					6.0	0 -
							-					6.0	,
.50 - 6.95	SPT (S)	6.50		N=33 (4,5/6	5 8 0 10\		<u> </u>					6.5	5
.50 - 0.35	N=33	0.30		14,5/6	(10,5,10		-					<b>1</b> 0.5	, .
.00 - 7.70	B8						-					7.0	n -
.00 - 7.70	20						-					<b>1</b> '''	_
							-		-			7.5	5
.70 - 8.50	В9					-9.24	7.70		A disconding to the second sec	1		/.5	, ,
		0.00		N=14/13/	) ) A A\		Ŀ	× × ×	Medium dense brown very silty sandy subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse				0 -
.00 - 8.45	SPT (S) N=14	8.00		N=14 (1,2/3	0,3,4,4)		ļ <sup>-</sup>	× × ×				8.0	, –
							<u> </u>	×××					
							-	×····×				8.5	,
00. 10.00	D10						(2.30)	×					^
.00 - 10.00	B10						[	×				9.0	) —
50	D46						-	×××					_
.50 .50 - 9.95	D16 SPT (S)	9.50		N=25 (3,4/5	5,5,7,8)		-	××××				9.5	5 -
	N=25				•			×					
						-11.54	10.00	×.·····×	1	1			_
<b>emarks</b> eck to Bed = 3.2	20m								Water Strikes   Chi	To	(m) .50	Time (hh:r 01:00	
									2.30	2	.ου	01:00	J
									Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)				
rminated at sc	hedulad	dent	h						2.00 10.00 10.00 200				
minateu di SC	neduied	ueμι								_			_

						Project	No.:	Project	Name:						Во	reho	le No.:
(ACK)	CAI	IS	E	WAY		17-016			Sewerage Scheme	Marine (	Dutfall G					ВН	14
		_G	EO	TECH		Coordi		Client:							S	heet	2 of 2
	1					32490	1.92 E	Irish W									
Method Cable Percussion		nt U		<b>Top</b> 0.00	<b>Base</b> 10.00	17330	7.18 N		s Representative: Looby ARUP J.V.								1:50
						Ground	d Level:	Dates:							Dri	ller:	CC
							5 mOD	02/08/							Log	gger:	SG
Depth (m)	Sample / Tests	Casing Depth	Water Depth (m)	Field Re	cords	Level (mOD)	Depth (m) (Thickness)	Legend		D	escription				Water	Back	fill
10.00 - 10.45	SPT (S)	10.0	()	N=30 (4,5/6	,6,9,9)	(IIIOD)	- (THICKHESS)			End of Bo	orehole at	10.00m			Ĺ		
	N=30	0															
																	10.5 —
							-										-
							-										11.0 —
							_										11.5
							-  -										=
							_										12.0 -
							_										
							<u> </u>  -										12.5
							-										
							-										13.0 -
							-  -										=
																	13.5
							-										-
							-										14.0
							[										
							-										14.5 —
							-										
							<u>-</u> [										15.0 —
							-										
																	15.5 — —
							-										-
							-										16.0 —
																	16.5
							-										=
							_										17.0 —
							-										
							<u> </u>										17.5
							-										]
							-										18.0 —
							-										
							-										18.5 —
							<u> </u>										
							-										19.0
							-										
							<u> </u>										19.5 —
							-										
											\A/a+a	Strikes		CL:	oll:-	a Det	aile
Remarks Deck to Bed = 3	.20m									Struck at (m)	Casing to (m)	Strikes Time (min)	Rose to (m)	From (m) 2.30	To	g Deta m) 50	Time (hh:mm) 01:00
															۷.		-1.00
										Water From (m)	Added To (m)		Details Diam (mm)				
Terminated at so	cheduled	dept	h														

200						Project			t Name:	В		le No.:
	CAL	JS	E١	<b>VAY</b> TECH		17-016 Coordi		Arklow Client:	Sewerage Scheme Marine Outfall GI		RH	115
		−G	EO	TECH				Irish W			Sheet	1 of 2
Method	Pla	nt Us	ed	Тор	Base	32501			s Representative:	Sc	cale:	1:50
Cable Percussio		ndo 30		0.00	12.38	17319			Looby ARUP J.V.	-		
						Ground	d Level:	Dates:		_D	riller:	CC_
						-2.16	6 mOD	25/08/	2017	Lo	ogger:	SG
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Back	fill
0.00 - 1.00	B1						-		MADE GROUND: Medium dense black slightly sandy slightly silty subrounded fine to medium GRAVEL with fragments of red brick and			
							-		organics. Sand is fine to coarse.			
0.50	ES28						-					0.5
							(1.50)					
1.00 1.00 - 1.45	D12 SPT (S)	1.00		N=10 (2,2/2	2,2,3,3)		_					1.0 -
	N=10						-					
1.50 1.50 - 2.00	ES29 B2					-3.66	- 1.50	××	Grey very gravelly slightly silty fine to coarse SAND with low cobble			1.5
							(0.50)	* * * * * *	content and occasional shells. Gravel is subrounded fine to coarse.			
2.00 2.00 - 2.50	D13 B3					-4.16	- 2.00	×××	Loose to medium dense grey fine to medium SAND.	$\neg$		2.0 -
2.00 - 2.45	SPT (S) N=9	2.00		N=9 (1,2/2,	2,2,3)		- -					
2.50	N=9 ES30						<del>-</del>					2.5
3.00 3.00 - 3.45	D14 SPT (S)	3.00		N=15 (2,3/3	3.4.4.4)		-					3.0 -
3.13	N=15	5.00		10 (2)3/5	2, ., ., .,		(2.70)					
3.50 3.50 - 4.00	ES31 B4						-					3.5
3.30 - 4.00							-					
4.00 4.00 - 4.20	D15 B5						_					4.0 -
4.00 - 4.45	SPT (S)	4.00		N=20 (3,4/4	4,5,5,6)		-					
4.50	N=20 ES32						_					4.5
4.70 - 6.00	В6					-6.86	- 4.70 -		Stiff grey slightly sandy CLAY. Sand is fine to coarse.			
5.00 - 5.45	UT25			Ublow=92 1	100%		-					5.0 -
							-					
5.50	D16						- - -					5.5
	ES33						(2.30)					
6.00 - 7.00	В7											6.0 -
							-					
6.50	D17	C 5.0		N-44			-					6.5
6.50 - 6.95	SPT (S) N=44	6.50	- 1	N=44 (7,7/8,11,1	1,14)		-					
7.00 - 8.00	B8					-9.16	7.00	× × ×	Medium dense brown very sandy slightly silty subangular to subrounded	$\dashv$		7.0 —
							-	^` × × × ×	fine to coarse GRAVEL. Sand is fine to coarse.			
7.50	D18			N 4= 1: = 1			-	×××				7.5
7.50 - 7.95	SPT (S) N=15	7.50		N=15 (1,2/3	3,3,4,5)		(1.50)	×××				
							- -	× × ×				8.0 –
							-	× × ×				
8.50	D19					-10.66	8.50	×	Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse.	$\dashv$		8.5
8.50 - 9.50 8.50 - 8.95	B9 SPT (S)	8.50		N=22 (3,3/4	4,5,6,7)		- -		Gravel is subrounded fine to coarse.			
9.00 - 9.45	N=22 UT26			Ublow=57 1			(1.00)					9.0 -
2.00 3.73	3.23			55.5**-5/ 1	_5070		-					
9.50	D20					-11.66	- - 9.50		Firm to stiff thinly laminated brown slightly sandy slightly gravelly CLAY.	_		9.5
9.50 - 10.00	B10						- -		Sand is fine to coarse. Gravel is subrounded fine to medium.			
10.00 - 11.00	B11						-			_		
Remarks	<u> </u>	1				<u> </u>	l	<u> </u>			ng Deta	
Deck to Bed = 4.	.00m								Struck at (m) Casing to (m) Time (min) Rose to (m) From (m	) Т	To (m)	Time (hh:mm
									Motor Added Control Date 11			
									Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)           2.00         13.00         Diam (mm)         Diam (mm)			
Terminated at re	efusal on	large l	bould	der/possibl	e bedrock	k			2.00   12.00			

20					<b>\</b>	Projec			t Name:	В		ole No.:
XX	CAL	JS	E	<b>VAY</b>		17-016			Sewerage Scheme Marine Outfall GI	$\perp$	RI	115
		-G	EO	TECH		Coordi 32501		Client: Irish W			Shee <sup>-</sup>	2 of 2
Method		nt Us		Тор	Base	1		Client's	s Representative:	Sc	ale:	1:50
Cable Percussion	n Dan	do 30	000	0.00	12.38		2.19 N		Looby ARUP J.V.	Dı	riller:	СС
							<b>d Level:</b> 6 mOD	<b>Dates:</b> 25/08/	2017	Lo	ogger	: SG
	Sample /	Casing Depth (m)	Water Depth (m)	Field Re	ecords	Level	Depth (m)	Lamand	Description	Water	_	
	Tests SPT (S)	10.0		N=12 (1,2/3	3,3,3,3)	(mOD)	(Thickness)		Firm to stiff thinly laminated brown slightly sandy slightly gravelly CLAY.	>		- X
	N=12 D21	0							Sand is fine to coarse. Gravel is subrounded fine to medium.			10.5
	UT27 B24			Ublow=50 1	100%		(2.88)					11.0 —
11.45	D22						- - - - -					11.5 — - - - -
	D23 SPT (S)	12.0 0		N=50 (2,3/5 235mm)	50 for	-14.54			End of Borehole at 12.38m			12.0 —
							-		2.0 0. 200.000 0. 1200			12.5 — — — — — — —
							-					13.5
							- - -					14.0 —
							-					14.5 — —
							-					15.0 —
							- - - -					15.5 — — — — — —
							- - - -					16.5
							-					17.0 —
							-					17.5 —
							- - - - -					18.0 —
							- - - -					18.5 —
												19.0 —
							-					19.5 — — — — —
Remarks						<u> </u>					ng De	
Deck to Bed = 4.0		arge	boul	der/possibl	e bedroc	k			Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)		o (m)	Time (hh:mm)

202				\	Project			t Name:	Bor		No.:
KQK.	CAL	JSE	WAY		17-016			sewerage Scheme Marine Outfall GI		BH1	.6
		-GEC	<b>WAY</b> TECH		Coordi		Client:		Sł	eet 1	of 2
		<u> </u>		1	32472	5.91 E		s Representative:	See	le:	1.50
Method Cable Percussion		nt Used ido 3000	<b>Top</b> 0.00	<b>Base</b> 11.50	17348	4.90 N		s Representative: Looby ARUP J.V.			
					Ground	d Level:	Dates:	•	Dril	ler: /	AΗ
						3 mOD	05/11/		Log	ger:	_N
Depth	Sample /	Casing Water Depth Depth	Field Re	ecords	Level	Depth (m)	Legend	Description	Water	Backfi	II
(m)	Tests	(m) (m)			(mOD)	(Thickness)		Grey sandy slightly silty subangular to subrounded fine to coarse GRAVEL	>	V NAN	)
						(0.80)	9	with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are subangular to subrounded.			
0.50	D20					(0.80)	9 9				0.5
0.80 - 1.20	ES1 B7				-5.13	0.80	a . º a	Soft grey sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is	- 1		-
1.00 - 1.45	SPT (S)		N=5 (1,2/1,	1,2,1)		-	^ ×	subangular to subrounded fine to medium.			1.0
	N=5					(1.00)	×				-
1.50	D21					<u> </u>	×	: 			1.5
1.80 - 2.20	ES2 B8				-6.13	1.80	× ×				
2.00 - 2.50	UT18		Ublow=8 89	9%		-	X	× , <b>0</b> . , , , . ,			2.0 —
						[	X	×			
2.50	D22					-	X	×			2.5
2.80 - 3.20	ES3 B9						×××	×			
3.00 - 3.45	SPT (S)		N=6 (1,1/2,	1,1,2)		-	×××	×			3.0 —
	N=6					(2.70)	×××	×			
3.50	D23					-	×××	×			3.5 —
3.80 - 4.00	ES4 B10					Ė	$\times \times $	×			
4.00 - 4.50	UT17		Ublow=10	93%		_	$\times \times $	×			4.0
						-	×××	×			
4.50	D24				-8.83	- 4.50	$\times \times \times$				4.5
	ES5				5.55	- 4.50	× × × × ×	Loose grey gravelly very silty fine to coarse SAND. Gravel is subangular to subrounded fine.			-
4.80 - 5.20 5.00 - 5.45	B11 SPT (S)		N=7 (5,2/2,	2 1 21		_	.×.× ×.×.×				5.0 —
5.00 - 5.45	N=7		14-7 (3,2/2,	۷, ۱, ۷,		(1.40)	.× × × × ×				3.0 -
5 50	חשב					[	.×. ×  . × ×				5.5
5.50	D25 ES6					<u> </u>	. × × × × ×				5.5 — -
5.80 - 6.20	B12		N-20 /2 1/	4 F F C'	-10.23	5.90	×××	Medium dense grey sandy slightly silty subangular to subrounded fine to			-
6.00 - 6.45	SPT (C) N=20		N=20 (3,4/4	4,5,5,6)		-	9	coarse GRAVEL with medium cobble and boulder content. Sand is fine to			6.0 —
						<u>-</u>	9	coarse. Cobbles and boulders are subrounded to rounded.			
6.50	D26					-	, a				6.5 —
6.80 - 7.20	B13					-	9 9				
7.00 - 7.45	SPT (C) N=23		N=23 (4,4/5	5,6,5,7)		E	è 0				7.0 —
	-					[	800				
7.50	D27					- (3.40)	, o , o				7.5 —
7.80 - 8.20	B19					[	å ° .				
8.00 - 8.45	SPT (C) N=31		N=31 (4,5/6	5,7,8,10)		-	å , å				8.0 —
	14-2T					Ė	, o , o				-
8.50	D28					-	å ° ° (				8.5 —
8.80 - 9.20	B14					<u>-</u>	å ° ° (				
9.00 - 9.45	SPT (C)		N=39			-	, o , o				9.0 —
	N=39		(6,5/8,10,1	1,10)	-13.63	9.30	,	Madium dones to dones green elizability agreedly, elizability eliz			-
9.50	D29					<u> </u>	$\hat{\mathbf{x}} \times \hat{\mathbf{x}} \times \hat{\mathbf{x}}$	Medium dense to dense grey slightly gravelly slightly silty fine to coarse SAND. Gravel is subangular to subrounded fine to medium.			9.5
9.80 - 10.20	B15					-	× × ×				
	-					-	×. ×. ×	:			-
Remarks	<u> </u>		<u> </u>		<u> </u>	<u> </u>	<u> </u>			Detai	
Drilled from float	ting platf	orm						Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (n	n) Tii	me (hh:mm)
								Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
Terminated at vir	rtual refu	ısal in grar	nular mater	ial							
										_	

					1	Project	t No.:	Project	: Name:						Во	ehol	e No.:
(KSK)	CAI	IS	E	<b>ΜΔΥ</b>	7	17-016			Sewerage Scheme	Marine (	Outfall G					ВН	16
		−G	EO	WAY TECH		Coordi	nates:	Client:							S	neet	2 of 2
						32472	5.91 E	Irish W									-
Method Cable Percussion		nt Us		Top	Base	17348	4.90 N		Representative:						Sca	le:	1:50
Cable Percussion	n Dan	do 30	000	0.00	11.50				Looby ARUP J.V.						_ Dri	ller:	АН
							<b>d Level:</b> 3 mOD	<b>Dates:</b> 05/11/	2017						Los	ger:	ΙN
Depth	Sample /	Casing	Water Depth	-:		Level	Depth (m)		2017						+		-
(m) 10.00 - 10.45 10.50 10.80 - 11.20 11.00 - 11.45	Tests  SPT (C) N=27  D30  B16  SPT (C) N=45	Casing (m)	(m)	N=27 (5,6) N=45 (6,8/10,12		-15.83	(Thickness)  (2.20)  (1.50)  (1.50)	Legend	Medium dense to dens SAND. Gravel is subang	se grey sligh	rounded fi	y slightly s ine to med	silty fine to	o coarse	Water	Backing Associated Aso	11.0 — 11.5 — 12.0 — 13.5 — 14.0 — 14.5 — 14
																	15.5 — 16.0 — 17.5 — 17.5 — 18.0 — 18.5 — 19.0 — 19
Remarks Drilled from fload Terminated at vii			n grar	nular mate	rial					Struck at (m)  Water From (m)	Water Casing to (m)  Added To (m)	Time (min)	Rose to (m)  Details Diam (mm) 200	Ch From (m)		g Deta	19.5 — ———————————————————————————————————

202					Project			t Name:	Во		No.:
XX	CAL	JSE\	VAY		17-016			v Sewerage Scheme Marine Outfall GI	_	BH1	.7
		-GEO	<b>VAY</b> TECH		Coordi		Client: Irish W		S	heet 1	L of 2
Method	Pla	nt Used	Тор	Base	32476			s Representative:	Sca	ıle:	1:50
Cable Percussion		do 3000	0.00	12.90	17351			Looby ARUP J.V.	-		
					Ground	d Level:	Dates:	·	Dri	ller: /	AH
							03/11/	/2017	+-	ger:	LN
Depth (m)	Sample / Tests	Casing Water Depth Depth (m) (m)	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfi	11
						-	9	Medium dense brown very sandy slightly silty subangular to subrounded fine to coarse GRAVEL with medium cobble and boulder content. Sand is	T		
0.50	D1					-	0 0	fine to coarse. Cobbles and boulders are subangular to subrounded of mixed lithologies.			0.5 —
	ES29					-	, a	inned idiologics.			
0.80 - 1.20 1.00 - 1.45	B15 SPT (C)		N=27 (3,8/4	17881		-					1.0
1.00 - 1.45	N=27		N=27 (3,8/4	+,7,8,8)		-	9 9				1.0 -
1.50	D2					-	å ° °				- 1.5 —
	ES30					- -	å ° °				1.5 -
1.80 - 2.20	B16		N=20 /4 2 /	1550		<u>-</u>	å ° å				-
2.00 - 2.45	SPT (C) N=20		N=20 (4,3/4	+,ວ,ວ,b)		(4.10) -	a 9 a				2.0 —
2.50	D2					<u>-</u>	a ° a				
2.50	D3 ES31					-	a ° a				2.5 — - -
2.80 - 3.20	B17		N 22 /4 5 /5			-	a °°				-
3.00 - 3.45	SPT (C) N=22		N=22 (4,5/5	,0,0,5)		-	9 9				3.0 —
2.50	D4					- -	9 9				
3.50	D4 ES32					-	a ° a				3.5 —
3.80 - 4.20	B18					-	a ° 4				-
4.00 - 4.45	SPT (C) N=21		N=21 (3,4/5 Water strike		-5.06	4.10	, o	Medium dense grey sandy slightly silty subangular to subrounded fine to	┵		4.0 —
			4.10m			-		coarse GRAVEL with low cobble and boulder content. Sand is fine to			
4.50	D5 ES33					(1.10)		coarse. Cobbles and boulders are subangular to subrounded of mixed lithologies.			4.5 —
4.80 - 5.20	B19						، م د د د د د د د د د د د د د د د د د د د				
5.00 - 5.45	SPT (C) N=11		N=11 (3,4/5	5,2,2,2)	6.45	- 5.30	، م د د د د د د د د د د د د د د د د د د د				5.0 —
					-6.16	- 5.20 -	X X X	Very soft grey silty sandy slightly gravelly clayey SILT . Sand is fine to coarse. Gravel is subangular to subrounded fine to medium.			
5.50	D7 ES34					-	× × × × × × × × ×	×			5.5 —
5.80 - 6.00	B20					-	× × × × × ×				
6.00 - 6.50	UT27		Ublow=12 9	98%		- (1.60)	× × × × × ×				6.0 —
						-	$\times \times $				
6.50	D8					-	××× ×××				6.5 —
6.80 - 7.20	B21				-7.76	6.80	× × ×	×	-		
7.00 - 7.45	SPT (S) N=9		N=9 (2,3/2,	2,3,2)		-	$\times \times $				7.0 —
	"-"					- -	$\times \times $	× :			
7.50	D9					-	$\times \times \times \times$	*			7.5 —
7.80 - 8.00	B22					-	$\times \times $				
8.00 - 8.50	UT28		Ublow=15 9	98%		-	$\times \times \times$				8.0 —
						(2.90)	$\times \times \times \times$				
8.50	D10					_	$(\times \times \times)$				8.5 — -
8.80 - 9.20	B23					<u>-</u>	(				
9.00 - 9.45	SPT (S)		N=16 (3,3/4	1,4,4,4)		-	(				9.0
	N=16					-	× × × : : × × × × × × :				
9.50	D11					-	× × × × × ×				9.5
9.80 - 10.20	B24				-10.66	9.70			-		
-						-		with low cobble and boulder content. Sand is fine to coarse. Cobbles and	+		-
Remarks							1		isellin To	g Detai	ils me (hh:mm)
Drilled from floa	ting platf	orm						Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)	12		01:00
								Water Added Casing Details			
								From (m)   To (m)   To (m)   Diam (mm)			
Terminated at re	fusal on l	large boul	der								

						Project			t Name:	Во		e No.:
CHO H	CAL	JS	E	<b>WAY</b>		17-016			Sewerage Scheme Marine Outfall GI		BH:	17
		-G	EC	TECH		Coordi		Client: Irish W		S	heet :	2 of 2
Method	Pla	nt Us	sed	Тор	Base	32476			s Representative:	Sca	ale:	1:50
able Percussion		do 30		0.00	12.90	17351	9.44 N	Byrne I	Looby ARUP J.V.	Dri	iller:	ΔΗ
							d Level:	Dates:	2017	-	gger:	
Depth	Sample /	Casing Depth	Water	Field D		-0.9	6 mOD  Depth (m)	03/11/		+-		
(m) 0.00 - 10.45	Tests SPT (C)	(m)	Water Depth (m)	Field Re		(mOD)			Description boulders are subrounded to rounded of mixed lithologies.	Water	Backf	111
200 20113	N=36			50 (0),70	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		-	a ° a	sociates are subscanded to surface of this control of the subscanding such			
0.50	D12						-	a ' c ' (				10.5
0.80 - 11.20	B25						(2.00)	a				
1.00 - 11.45	SPT (C) N=40			N=40 (8,7/8,10,10	0,12)		-	a ° ° ° °				11.0 -
1.50					•		-					
50	D13					-12.66	11.70	- · · · ·	Versit and the second s			11.5
1.80 - 12.20 2.00 - 12.45	B26 SPT (S)			N=36 (7,8/8	8.8.9 11\			٠ م م م	Very stiff grey slightly sandy slightly gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is subangular to			12.0 -
12.73	N=36			50 (7,0/6	.,.,.,.11		(1.20)		subrounded fine. Cobbles and boulders are subangular to subrounded of mixed lithologies.			
2.50	D14						- (1.20)					12.5
							-					
						-13.86	- 12.90 -	124 LA 6 3	End of Borehole at 12.90m			13.0 -
							-					
							-					13.5
							-					14.0 -
							-					
							-					14.5
							-					15.0 -
							-					15.5
							_					16.0 -
							-					
												16.5
							_					17.0 -
							-					
							-					17.5
							_					18.0 -
							<u> </u>					
							-					18.5
							-					
							-					19.0 -
							-					
							-					19.5
							-					
marks illed from floa	ting platf	orm							Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To		ime (hh:mr
	Black								12.90	12	.90	01:00
									Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
									12.90 200			

				\	Project			t Name:	Bor		e No.:
HXX.	CAL	JSE	WAY		17-016			sewerage Scheme Marine Outfall GI		BH1	18
		-GEC	<b>WAY</b> TECH		Coordi		Client:		Sł	neet 1	L of 2
		<u> </u>			32479	1.47 E	Irish W		500	le:	1.50
Method Cable Percussion	_	nt Used do 3000	<b>Top</b> 0.00	<b>Base</b> 11.30	17354	7.27 N		s Representative: Looby ARUP J.V.			
					Ground	d Level:	Dates:		Dril	ler: /	AH
						2 mOD	06/11/		Log	ger:	LN
	Sample /	Casing Water Depth Depth	Field Re	ecords	Level	Depth (m) (Thickness)	Legend	Description	Water	Backfi	ill
(m)	Tests	(m) (m)			(mOD)	(Thickness)	×	* Medium Dense greyish black sandy slightly silty subangular to subrounded	_	3 V 4 V	7
							× ^×	fine to coarse GRAVEL with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are subangular to subrounded of			
0.50	D18 ES9					-	××××	mixed lithologies.			0.5 -
0.80 - 2.20	B1					<del>-</del> -	× ^ ×				
	SPT (C)		N=11 (3,4/3	3,3,2,3)			×				1.0 —
	N=11					-	× × ×	*			
1.50	D19					(3.00)	× × ×	*			1.5
	ES10					-	×	*			
2.00 - 2.50	UT15		Ublow=11	98%		-	×	*			2.0 —
						-					
2.50	D20					<u>-</u>					2.5
	ES11 B2					-	× × ·×				4
3.00 - 3.45	SPT (S)		N=7 (1,1/1,	2,2,2)	-3.72	- - 3.00	::×0	Soft grey slightly sandy silty CLAY with occasional bands of grey SAND			3.0 —
	N=7					<del>-</del> -	X_X	throughout. Sand is fine to coarse.			
3.50	D21					-	×_×				3.5 -
	ES12						×				
4.00 - 4.50	UT16		Ublow=14 9	97%		_	×				4.0 —
						- -	×				
4.50	D22					-	×				). 4.5 -
	ES13					- -	×				
	B3 SPT (S)		N=9 (1,1/2,	2 2 21		(3.80)	×_^_ ×				5.0 —
	N=9		N-9 (1,1/2,	2,2,3)		-	×				3.0
F 50	D22					-	×				
5.50	D23 ES14					-	×				5.5 -
						- -	×				
6.00 - 6.50	UT17		Ublow=16 8	88%		_	×				6.0 —
						-	X———				Á
6.50	D24					<u>-</u> -	×-^-				6.5
	B4				-7.52	6.80	X	Soft to firm grey slightly sandy slightly gravelly silty CLAY with occasional	<b>∦ I</b>		
	SPT (S) N=7		N=7 (2,2/1,	2,2,2)		<del>-</del>	<u>×</u>	bands of grey SAND throughout. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium			7.0 —
	,					<del>-</del>	X-:	Subangular to Subrounded fille to filedidiff			
7.50	D25					(1.50)	X				7.5 -
7.80 - 8.20	B5					-	X-;-				
8.00 - 8.45	SPT (C)		N=24 (2,3/4	4,5,7,8)		_	X——				8.0 —
	N=24				-9.02	- - 8.30	X	Dense grey very sandy slightly silty subangular to subrounded fine to			
8.50	D26						4 X	coarse GRAVEL with low cobble and boulder content. Sand is fine to			8.5 -
8.80 - 9.20	В6					-	a × , a×	coarse. Cobbles and boulders are subrounded to rounded of mixed lithologies.			
9.00 - 9.45	SPT (C)		N=41			<del>-</del>	4 X	- - - - - -			9.0 —
	N=41		(6,8/8,10,1	0,13)		(3.00)	a × , a× ,				á
9.50	D27					-	a × , a× ,				9.5 -
9.80 - 10.20	В7					[	a X , a X ,				
5.00 10.20	<i>J</i> ,					_	4 ×		$\perp$		ŝ
Remarks					İ		<u> </u>		selling		
Drilled from float	ting platfo	orm						Struck at (m) Casing to (m) Time (min) Rose to (m) From (m)	To (r	n) Ti	ime (hh:mm
								Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
	rtual refu	sal in grar	nular mater	ial							

						Project		Project	: Name:						Bor	hole	No.:
(KCK)	CAI	IS	E	WAY		17-016			Sewerage Scheme	Marine (	Outfall G	l				BH18	
		-G	EO	TECH		Coordi		Client:				_		_	Sh	eet 2	of 2
NA - 4 la - al	DI-				D	32479	1.47 E	Irish W							Capi	<b>.</b> 1.	E0
Method Cable Percussio		nt Us do 30		<b>Top</b> 0.00	<b>Base</b> 11.30	17354	7.27 N		s Representative: Looby ARUP J.V.							<b>e:</b> 1:	
						Ground	d Level:	Dates:	71101 3.4.						Dril	er: Al	1
							2 mOD	06/11/	2017						Log	ger: LN	١
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field R	ecords	Level (mOD)	Depth (m) (Thickness)	Legend		D	escription				Water	Backfill	
10.00 - 10.45	SPT (C)	,,	(,	N=49	12.44\	(05)	-	ο X , σ X 9	Dense grey very sandy	slightly silt	y subangu	lar to subr	ounded fir	ne to			
	N=49			(7,7/10,12,	13,14)		-	a × , a × 9	coarse GRAVEL with lov coarse. Cobbles and bo								
10.50	D28							a × , a × 9	lithologies.								10.5 —
10.80 - 11.20	B8						-	a									
11.00 - 11.20	SPT (C)			50 (8,17/50 50mm)	) for			a × , a × 0									11.0 —
						-12.02	11.30	M.XI.		End of Bo	orehole at	11.30m			1 6		11.5
							-										11.5 —
							_										12.0 -
							-										12.0
																	12.5 —
							-										=
																	13.0
							-										
							[										13.5
							ŧ										3
							_										14.0 —
																	1
							-										- 14.5 —
							-										3
							-										15.0 —
																	=
																	15.5
							-										=
							-										16.0
							<u> </u>										3
							-										16.5
							<u> </u>										
							-										17.0
							[										=
							ŧ										17.5 —
							-										]
							-										18.0 —
							-										
							-										18.5 —
							_										19.0
							-										19.0
							_										- 19.5 —
							-										~~~ <b>~</b>
							-										1
Remarks												Strikes				Details	
Drilled from floa	ting platf	orm								Struck at (m)			Rose to (m)	From (m)	To (m		(hh:mm)
										\A/a+-	٨٨٨٥٨	Casin	Doto!!-				
										Water From (m)	To (m)	To (m) 11.30	Details Diam (mm) 200				
Terminated at vi	rtual refu	sal in	n grar	nular mater	ial							11.30	200				

200				\	Project			t Name:	Во	rehol	
大公	CAL	JSE	WAY TECH		17-016 <b>Coordi</b>		Arklow Client:	v Sewerage Scheme Marine Outfall GI	-	BH	19
		-GEO	TECH				Irish W		5	Sheet 1	1 of 1
Method	Plar	nt Used	Тор	Base	32426			's Representative:	Sc	ale:	1:50
Cable Percussion		do 3000	0.00	6.50	17358	2.51 N		Looby ARUP J.V.			
					Ground	d Level:	Dates:		Dr	iller:	AH
							07/11/		Lo	gger:	LN
Depth (m)	Sample / Tests	Casing Water Depth Depth (m) (m)	Field Re	ecords	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backf	ill
(111)	iests	()			(IIIOD)	-		Medium dense grey very sandy slightly silty subangular to subrounded fine	_		Z.
0.80 - 1.20 1.00 - 1.45 1.50	D15 ES7 B1 SPT (S) N=24 D16 ES8 B2		N=24 (4,6/5	5,8,6,5)	-3.00	(1.80)		to coarse GRAVEL with low cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are subangular to subrounded of mixed lithologies.			0.5 - 1.0 -
	UT13		Ublow=12 1	100%	3.00	- 1.00	× <u>×</u> <u>×</u>	Very soft greyish brown sandy organic silty CLAY. Sand is fine to coarse.			2.0 —
-						(0.80)	× <u>×</u> <u>sde</u>	1			
2.50	D17					-	× <u> </u>	3			2.5
	ES9				-3.80	2.60	× ×	Loose grey slightly gravelly very silty fine to coarse SAND. Gravel is			
	B3 SPT (S)		N=8 (2,1/2,	2 2 21			×、×	subangular to subrounded fine to medium.			3.0
	N=8		14-0 (2,1/2,	2,2,2)		(0.90) - -	X				
II	D18 ES10				-4.70	- 3.50	××.× ××.×	Very soft greyish brown sandy slightly gravelly clayey SILT. Sand is fine to	1		3.5 -
II	B4					[	(	coarse. Gravel is subangular to subrounded fine.			
4.00 - 4.50	UT14		Ublow=15 1	100%		-	(				4.0 —
							× × × × × ×				
II	D19					- (1.80)	×××				4.5 -
	ES11 B5						$(\times \times \times$				
5.00 - 5.45	SPT (S) N=17		N=17 (2,2/4	4,3,5,5)		- - -	× × × × × × × × ×				5.0 —
					-6.50	5.30	×××	Weathered grey AMPHIBOLITE recovered as sandy slightly silty angular to	-		
	D20 ES12 B6					-		subangular medium to coarse GRAVEL and low cobble content. Sand is fine to coarse. Gravel is composed exclusively of amphibolite. Cobbles are angular to subangular of amphibolite.			5.5 -
	SPT (C)		N=45			(1.20)		angular to subangular or ampinibulite.			6.0 —
	N=45		(4,5/8,10,1	2,15)		-					
					-7.70	- - 6.50					6.5
					-7.70	6.50		End of Borehole at 6.50m			6.5
						-					
						-					7.0 —
						-					7.5 -
						-					
						-					8.0 —
						-					8.5 -
						-					
											9.0 —
						-					9.0
						-					
						-					9.5 -
					<u> </u>				$\pm$		$\pm$
Remarks										ng Deta	ils Time (hh:mm
Drilled from float	ing platfo	orm						Struck at (m)   Casing to (m)   Time (min)   Rose to (m)   From (m)	To	(iii) T	iane (nn:mm
								Married C. C. T			
								Water Added         Casing Details           From (m)         To (m)         To (m)         Diam (mm)			
erminated on la	rge bould	der/weath	nered bedro	ock				6.50 200			