PRICENED. 78/07/2023

Appendix 4

Infiltration Test Records

Report No. 22150 17 | P a g e

f -value from field tests Soakaway Design (F2C) IGSI Contract: Contract No: 22150 Test No. TPSA01 735156.119 Northing: Client **ARUP** Easting: 698516.401 Date: 06/11/2019 Elevation: 56.203 Summary of ground conditions Description Ground water from to 0.25 TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet 0.00 None observed 0.25 0.40 SUBSOIL: Brown sandy gravelly CLAY. Firm brown mottled grey mottled black sandy gravelly CLAY 0.40 1.50 1.50 2.00 Firm to stiff dark grey mottled black sandy gravelly CLAY Notes: Soakaway located beside trial pit TPSA01 Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m (m) (min) Length of Pit (L) 1.60 0.90 0.00 Initial depth to Water = 0.90 m 0.90 1.00 0.88 Final depth to water = m 2.00 0.88 Elapsed time (mins)= 60.00 3.00 0.88 0.87 4.00 Top of permeable soil lm 5.00 Base of permeable soil 0.87 10.00 0.87 15.00 0.87 0.87 20.00 0.88 25.00 0.88 30.00 Base area= 0.64 m2 0.88 35.00 *Av. side area of permeable stratum over test period 4.44 m2 0.88 40.00 Total Exposed area = 5.08 m2 0.88 50.00 0.88 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec ór Water level rose during test Depth of water vs Elapsed Time (mins) 70.00 <u>2</u>60.00 **,≣**50.00 **≟**40.00 **8**30.00 **2**0.00 10.00 0.00 0.87 0.87 0.88 0.88 0.89 0.89 0.90 0.90 0.91 Depth to Water (m)

Soakaway Design f -value from field tests (F2C) IGS Contract: 22150 Contract No: 22150 TPSA02 - Cycle 1 Test No. Northing: 734565.043 Client **ARUP** Easting: 698854.613 Date: 30/10/2019 Elevation: 51.856 Summary of ground conditions from Description Ground water to 0.00 0.30 TOPSOIL: Brown slightly sandy gravelly CLAY 0.30 MADE GROUND comprised of grey brown sandy gravelly CLAY 1.20 with occasional concrete fragments. 1.20 2.00 Firm grey slightly sandy slightly gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.95 0.95 0.00 Initial depth to Water = m 0.95 1.00 Final depth to water = 0.96 m 0.95 2.00 Elapsed time (mins)= 60.00 0.95 3.00 0.96 4.00 Top of permeable soil m 0.96 5.00 Base of permeable soil 10.00 0.96 15.00 0.96 0.96 20.00 0.96 25.00 0.96 30.00 0.72 Base area= m2 0.96 35.00 4.598 *Av. side area of permeable stratum over test period m2 0.96 40.00 5.318 Total Exposed area = m2 0.96 50.00 0.96 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec **or** No fall in water after 4 minutes Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 40.00 **%**30.00 <u>a</u>20.00 10.00 0.00 0.95 0.95 0.95 0.96 0.96 0.95 0.96 0.96 Depth to Water (m)

Soakaway Design f -value from field tests (F2C) IGS Contract: 22150 Contract No: 22150 TPSA02 - Cycle 2 Test No. Northing: 734565.043 Client **ARUP** Easting: 698854.613 Date: 30/10/2019 Elevation: 51.856 Summary of ground conditions from Description Ground water to 0.00 0.30 TOPSOIL: Brown slightly sandy gravelly CLAY 0.30 MADE GROUND comprised of grey brown sandy gravelly CLAY 1.20 with occasional concrete fragments. 1.20 2.00 Firm grey slightly sandy slightly gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.83 0.00 Initial depth to Water = 0.83 m 0.83 1.00 Final depth to water = 0.84 m 2.00 0.83 Elapsed time (mins)= 60.00 0.84 3.00 4.00 Top of permeable soil 0.84 m 0.84 5.00 Base of permeable soil 10.00 0.84 15.00 0.84 0.84 20.00 0.84 25.00 0.84 30.00 0.72 Base area= m2 0.84 35.00 5.126 *Av. side area of permeable stratum over test period m2 0.84 40.00 5.846 Total Exposed area = m2 0.84 50.00 0.84 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec **or** No fall in water level after 3 mins Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 40.00 **%**30.00 <u>a</u>20.00 10.00 0.00 0.83 0.83 0.83 0.84 0.83 0.84 0.84 0.84 Depth to Water (m)

f -value from field tests Soakaway Design (F2C) IGS Contract: 22150 Contract No: 22150 Test No. TPSA03 - Cycle 1 Northing: 699153.058 Client **ARUP** Easting: 734803.725 Date: 29/10/2019 Elevation: 49.262 Summary of ground conditions to Description Ground water from 0.00 0.20 TOPSOIL: Brown slightly sandy CLAY with occasional rootlets. Seepage in MADE 0.20 0.70 MADE GROUND comprised of brownish grey slightly sandy gravelly CL GROUND at 0.5m 0.70 1.50 Firm brown mottled black sandy gravelly CLAY 1.50 1.80 Firm to stiff dark grey slightly sandy very gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) Depth to Elapsed 1.80 Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.74 0.00 Initial depth to Water = 0.74 m 0.74 1.00 Final depth to water = 0.79 m 0.75 2.00 Elapsed time (mins)= 60.00 0.76 3.00 0.76 4.00 Top of permeable soil m 0.76 5.00 Base of permeable soil 0.77 10.00 15.00 0.77 0.77 20.00 0.77 25.00 0.77 0.72 30.00 Base area= m2 0.78 35.00 4.554 *Av. side area of permeable stratum over test period m2 5.274 0.78 40.00 Total Exposed area = m2 0.78 50.00 0.79 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f = 0.00011 m/min1.896E-06 m/sec or Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 <u>=</u>40.00 **8**30.00 **=**20.00 10.00 0.00 0.76 0.73 0.74 0.75 0.77 0.80 0.78 0.79

Depth to Water (m)

Soakaway Design f -value from field tests (F2C) IGS Contract: 22150 Contract No: 22150 Test No. TPSA03 - Cycle 2 Northing: 699153.058 Client **ARUP** Easting: 734803.725 Date: 29/10/2019 Elevation: 49.262 Summary of ground conditions to Description Ground water from 0.00 0.20 TOPSOIL: Brown slightly sandy CLAY with occasional rootlets. Seepage in MADE 0.20 0.70 MADE GROUND comprised of brownish grey slightly sandy gravelly CL GROUND at 0.5m 0.70 1.50 Firm brown mottled black sandy gravelly CLAY 1.50 1.80 Firm to stiff dark grey slightly sandy very gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) Depth to Elapsed 1.80 Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.90 0.00 Initial depth to Water = 0.90 m 0.90 1.00 Final depth to water = 0.94 m 0.90 2.00 Elapsed time (mins)= 60.00 0.91 3.00 0.91 4.00 Top of permeable soil m 0.91 5.00 Base of permeable soil 0.92 10.00 15.00 0.92 0.92 20.00 0.93 25.00 0.93 0.72 30.00 Base area= m2 0.93 35.00 *Av. side area of permeable stratum over test period 3.872 m2 0.94 40.00 4.592 Total Exposed area = m2 0.94 50.00 0.94 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time 0.0001 m/min f= 1.742E-06 m/sec or Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 <u>=</u>40.00 **8**30.00 **=**20.00 10.00 0.00 0.91 0.89 0.90 0.92 0.95 0.93 0.94

Depth to Water (m)

f -value from field tests Soakaway Design (F2C) IGS Contract: 22150 Contract No: 22150 Test No. TPSA04 - Cycle 1 Northing: 735091.006 Client **ARUP** Easting: 699223.709 Date: 06/11/2019 Elevation: 50.929 Summary of ground conditions Ground water from to Description 0.00 0.30 TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet Water influx at 0.30 0.90 MADE GROUND comprised of brown sandy gravelly CLAY 1.0m 0.90 2.00 MADE GROUND comprised of dark grey to black sandy very gravelly C 2.00 Firm brown mottled grey sandy gravelly CLAY One cycle carried out. Further cycles cancelled by Consulting Engineer due to influx of water Notes: Field Data Field Test Depth of Pit (D) 2.50 Depth to **Elapsed** Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.60 (m) (min) m 1.30 0.00 Initial depth to Water = 1.30 m 1.30 1.00 Final depth to water = 1.31 m 1.30 2.00 Elapsed time (mins)= 60.00 1.30 3.00 1.30 4.00 Top of permeable soil m 1.31 5.00 Base of permeable soil 10.00 1.31 15.00 1.31 1.31 20.00 1.31 25.00 1.31 30.00 0.64 Base area= m2 1.31 35.00 *Av. side area of permeable stratum over test period 4.78 m2 1.31 40.00 5.42 Total Exposed area = m2 1.31 50.00 1.31 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec or No fall in water level after 4 minutes Depth of water vs Elapsed Time (mins) 70.00 **2**60.00 <u>ا</u> 50.00 40.00 **%**30.00 **=**20.00 10.00 0.00 1.30 1.30 1.30 1.31 1.30 1.31 1.31 1.31 Depth to Water (m)

TPSA01





TPSA02



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TPSA03







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TPSA04





PRICENED. 78/07/2023

Appendix 5

Plate Bearing Tests

Report No. 22150 18 | P a g e

PECENED. 7807/20

FLAIL	TECT DEDODT CHEET (E2 1)		Applied I	Proceuro /Sottlor	mont Cunyo		
Reference No.	R107335 REPORT SHEET (F3.1)		Applied	Pressure/Settler	nent Curve		
Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	22150 - Liffey Park Technology Camp PT01 Load See Map 0.6m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremen V.Lowe		(natural soil,	el (mOD) No. N/A	698862.771 735057.67 50.832 m bgl	I G S L	IVNAB NAB COLUMN COLUMNA COLUM
			/ Settlement				
0.00	50	100	150	200	250	0	300
-0.50		•					
€ -1.00							
<u></u>							
-2.00							
-1.50 -2.50 -2.50 -2.50 -2.50							
-3.00							
-3.50	-		Pressure (kN/m2)				

PECENED. 78075

PLATE T	TEST REPORT SHEET (F3.1)	Applied Pressure/Settlement Curve	.0
eference No. contract est No. ocation eepth lient late Diameter: est Method echnician authorised by late	R107355 22150 - Liffey Park Technology Campus PT01 Reload See Map 0.6m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadin V.Lowe 07/11/2019	Description of soil under test (natural soil, placed fill, sub-base) Firm brown mottled grey sandy gravelly CLAY Easting (m) 698862.771 Northing (m) 735057.67 Ground Level (mOD) 50.832 Sample Ref No. N/A Depth 0.00 m bgl	NAB NAB Assisted Testshap
0.00	50 100	Pressure / Settlement 150 200 250 300 350 400	450
-0.50 -1.00 -1.50 -1.50 -1.50			
-2.00			
-2.50		Pressure (kN/m2)	
lodulus of subgra	mm settlement intersection = 209 ade reaction = 134 MPa/m applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10 47.0 %	

PECENED. 78075

PLATE T	TEST REPORT SHEET (F3.1)		Applied	Pressure/Settleme	ent Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107336 22150 - Liffey Park Technology Campus PT03 load See Map 0.95m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loa V.Lowe Hugh Byrne 07/11/2019	iding Test	(natural soil	n) mOD) No. <u>N/A</u>	698715.377 734959.854 52.928 bgl	I G S L	PA NAB MAB MESHAD MESHA
		Pressure A	/ Settlement				
0.00	50	100	150	200	250)	300
-0.20							
		-					
-0.60 -0.80 -1.00 -1.20 -1.40							
-1.20							
-1.40 -1.60							
-1.80							
-2.00			Pressure (kN/m2)		_		
Modulus of subgra	mm settlement intersection = 132 ade reaction = 85 MPa/m applied = 0.64 as per HD 25-26/10	Ec	juivalent CBR value in accorda	nce with NRA HD25-26/10		21.2 %	

PROPINED. 7807/20

PLATE	TEST REPORT SHEET (F3.1)		Applied P	Pressure/Settleme	nt Curve		.0
Reference No.	R107336	"					
Contract	22150 - Liffey Park Technology Campus		Description o	of soil under test			
Test No.	PT03 Reload		(natural soil,	placed fill, sub-base)			
ocation	See Map		Firm to stiff greyish b	brown slightly sandy very gravelly CLAY		(atra)	150 17025
)epth	0.95m					(IVNAB
lient	Arup		Easting (m)		698715.377	\IGSL/	TESTING
late Diameter:	450 mm		Northing (m)		734959.854	Ltd.	W SCORE HEE NO. 1334
est Method	BS 1377: Part 9: 1990 Test4 - Incremental Loadi	ng Test	Ground Level		52.928	\smile	
echnician	V.Lowe		Sample Ref N				
Authorised by Date	07/11/2019		Depth	<u>0.00</u> m	ogi		
		Pressure / Se	ettlement				
0	50	100	150	200	250)	300
0.00	_				+		
-0.20							
-0.40							
-0.60							
-0.60 -0.80 -1.00 -1.00							
-1.00							
-1.20							
				_			
-1.40							
-1.40		P	ressure (kN/m2)				

PECENED. 780780

PLATE 7	TEST REPORT SHEET (F3.1)		Applied Pressur	e/Settlement Curve		.0
Reference No. Contract	R107337 22150 - Liffey Park Technology Campus		Description of soil und	ler test		
Test No.	PT04 Load		(natural soil, placed fil			
_ocation	See Map			rey sandy very gravelly CLAY		
Depth	0.4m					IVNAB
Client	Arup		Easting (m)	698808.795	IGSL	V ACCREDITED TESTING
late Diameter:	450 mm		Northing (m)	734863.887	Ltd.	DETAILED IN SCOTE HELL NO. 1331
est Method	BS 1377: Part 9: 1990 Test4 - Incremental Load	ling Test	Ground Level (mOD)	51.555		
echnician	V.Lowe		Sample Ref No. N/A			
Authorised by Date	07/11/2019		Depth 0.00) m bgl		
		Pressure / Set	lement			
0	50	100	150	200 250)	300
0.00						
-0.20						
-0.40						
]					
E -0.60	1					
-0.80						
-0.60 -0.80 -0.80 -1.00 -1.20 -1.20 -1.40		` ************************************				
E -1.00						
₹ -1.20						
% _{-1.40}						
-1.60						
-1.60		—				
-1.80						
-2.00		Pre	ssure (kN/m2)	_		
2.00						
Modulus of subgra	mm settlement intersection = 119 ade reaction = 76 MPa/m applied = 0.64 as per HD 25-26/10	Equival	ent CBR value in accordance with NR	A HD25-26/10	17.6 %	

PROPINED. 7807/20

PLATE 7	TEST REPORT SHEET (F3.1)		Ap	plied Pre	essure/Settlem	ent Curve		.0
Reference No. Contract Fest No. Location Depth Client Plate Diameter: Fest Method Fechnician Authorised by	R107337 22150 - Liffey Park Technology Campus PT04 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadii V.Lowe 07/11/2019	ng Test	(nat Firm East Nor Gro	ing (m) ching (m) und Level (r ple Ref No.	N/A	gravelly CLAY 698808.795 734863.887 51.555	IGSL Ids L	IVNAB
0.00 -0.20 -0.40 E -0.60	50 100	Pressure / \$		250	300	350	400	450
-0.60 -0.80 -1.00 -1.40 -1.60 -1.80			Pressure (kN/m²)					
Modulus of subgra	mm settlement intersection = 273 ade reaction = 176 MPa/m applied = 0.64 as per HD 25-26/10		Pressure (kN/m2) valent CBR value in	accordance	with NRA HD25-26/10		74.9 %	

PECENED. 780780

PLATE 7	TEST REPORT SHEET (F3.1)		Ap	plied Pressure/Settl	ement Curve		.0
deference No. Contract Test No. Cocation Depth Client Date Diameter: Test Method Technician Authorised by Date	R1073358 22150 - Liffey Park Technology Campus PT05 Load See Map 0.6m Arup 450 BS 1377: Part 9: 1990 Test4 - Incremental Loadii S.Cunningham 04/11/2019	ng Test	(nat Firm East Nort Grou	cription of soil under test ural soil, placed fill, sub-base brownish grey sandy very g ing (m) hing (m) nd Level (mOD) ple Ref No. N/A 0.00	698522.695 734945.924 55.965	I G S L	IV NAME NAME OF STATE
0	50	Pressure /	Settlement	200	250)	300
-1.00 -2.00							
-3.00 -3.00 -3.00 -3.00 -4.00							
-5.00		-	Pressure (kN/m2)				
odulus of subgr	mm settlement intersection = 50 ade reaction = 32 MPa/m applied = 0.64 as per HD 25-26/10	Eq	uivalent CBR value in	accordance with NRA HD25-26	/10	4.0 %	

PECENED. 78/07/20

PLATE 1	TEST REPORT SHEET (F3.1)		Applied Pr	ressure/Settlen	nent Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107338 22150 - Liffey Park Technology Campus PT05 Reload See Map 0.6m Arup 450 BS 1377: Part 9: 1990 Test4 - Incremental Load S.Cunningham 04/11/2019	ling Test	(natural soil, p	o. <u>N/A</u>	velly CLAY 698522.695 734945.924 55.965 m bgl	I G S L	PO NORS NAME OF TESTINO
0	50 100	Pressure / Settl	ement 250	300	350	400	450
-0.50							
-1.50 -2.50 -2.50							
-2.50 -3.00							
-3.50		Pres	sure (kN/m2)				
Gradient at 1.25 Modulus of subgra	mm settlement intersection = 101 ade reaction = 65 MPa/m applied = 0.64 as per HD 25-26/10		sure (kN/m2)	e with NRA HD25-26/10	0	13.2 %	

PECENED. 7807/20

PLATE 1	TEST REPORT SHEET (F3.1)	Applied Pressure/Settlement Cur	rve
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107339 22150 - Liffey Park Technology Campus PT06 Load See Map 0.6m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadi V.Lowe 01/11/2019	Northing (m) 7348	CLAY 661.485 805.081 54.489
		Pressure / Settlement	
0.00	50	150 200	250 300
-0.20			
-0.40 E -0.60			
-0.60 -0.80 -1.00 -1.20			
1.00			
-1.20			
-1.40			
-1.60	-	_	
-2.00		Pressure (kN/m2)	
Modulus of subgra	mm settlement intersection = 115 ade reaction = 74 MPa/m applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10	16.7 %

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PLATE TEST REPORT SHEET (F3.1)	SL) IVAB
Test No.	S L
Conting Cont	S L S L S L S L S L S L S L S L S L S L
Depth	S L
Easting (m) 698561.485 1 G 1	SL INAB ASSISTED TESTING STANLIN M SCOTE RES 400, 1231
Northing (m) 734805.081	SL DETAILED BY SCOTE HER 40, 1331
S 1377; Part 9: 1990 Test4 - Incremental Loading Test Sample Ref No. N/A Depth D.000 m bgl	GENERAL W SCOTE HER NO. 1331
Pressure / Settlement Pressure / Settlement O 50 100 150 200 250 300 350 O 0.00 O	
Pressure / Settlement -0.20 -0.40 -0.80 -0.80 -0.80 -0.80 -0.80 -0.80 -0.80 -0.80 -0.60 -0.80 -	
Pressure / Settlement 0 50 100 150 200 250 300 350 -0.20 -0.40 -0.60 -0.80	
Pressure / Settlement 0 50 100 150 200 250 300 350 -0.20 -0.40 -0.60 -0.80 -0.80	
0 50 100 150 200 250 300 350 -0.20 -0.40 -0.60	
0.00 -0.20 -0.40 -0.60 -0.80	
-0.20 -0.40 -0.60 -0.80	400
-0.40 -0.60 -0.80 -0.80	
-0.40 -0.60 -0.80 -0.80	
-0.40 -0.60 -0.80 -1.00 -1.00	
-0.40 -0.60 -1.00	
-0.60 -0.80 -1.00 -1.00	
-0.60 -1.00	
-0.80 -1.00	
-1.00 -1.00	
Ö -1.00	
-1.00	
100	
-1.20	· Na
Pressure (kN/m2)	
-1.40 Pressure (kN/mz)	
Gradient at 1.25 mm settlement intersection = 294	
fracilent at 1.25 mm settlement intersection = 294 foodulus of subgrade reaction = 189 MPa/m Equivalent CBR value in accordance with NRA HD25-26/10 84.	
orrection factor applied = 0.64 as per HD 25-26/10	2 %

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300

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PLATE 7	TEST REPORT SHE	ET (F3.1)		,	Applied Pr	essure/Settle	ment Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R1073341 22150 - Liffey Park Te PT07 Reload See Map 0.5m Arup 450 mm BS 1377: Part 9: 1990 To S.Cunningham 04/11/2019		ing Test		natural soil, p	. N/A	y CLAY 698495.699 734757.261 54.554 m bgl	IGSL	IVN AB NOT THE STATE OF THE STA
0 0.00	50	100	Pressu	200	250	300	350	400	450
-0.60 -0.80 -1.00 -1.20 -1.40		•			-				
-1.60 -1.80 -2.00				Pressure (kN/	m2)				
Modulus of subgr	mm settlement intersect ade reaction = 141 MPa/ applied = 0.64 as per HE	m		Equivalent CBR valu	e in accordance	e with NRA HD25-26/1	10	51.1 %	

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PLATE 7	TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve				
Reference No.	R107341			_			
Contract	22150 - Liffey Park Technology Campus		Description of soil under test				
Test No.	PT09 Load		(natural soil, placed fill, sub-base)				
_ocation	See Map		Firm to stiff light brown mottled grey sandy gravelly CLAY				
Depth	0.5m		IVNA	В			
Client	Arup		Easting (m) 698835.693 (IGSI.)	TING			
Plate Diameter:	450 mm		Northing (m) 698835.693 IGS L	10,1331			
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loadin	g Test	Ground Level (mOD) 51.023				
Technician	V.Lowe		Sample Ref No. N/A				
Authorised by Date	05/11/2019		Depth 0.00 m bgl				
0	50	Pressure / Set		00			
0.00			130 200 230 3	1			
0.20	T						
-0.20				1			
-0.40				1			
€ -0.60							
Ē							
-0.60 -0.80 -1.00 -1.20				1			
2 -1.00		`		-			
-1.20							
1.20							
· -1.40				1			
-1.60							
-1.80				1			
-2.00		Pres	ssure (kN/m2)				
	mm settlement intersection = 98						
	ade reaction = 63 MPa/m	Equivale	ent CBR value in accordance with NRA HD25-26/10 12.7 %				
orrection factor	applied = 0.64 as per HD 25-26/10						

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73341 50 - Liffey Park Tec 9 Reload	chnology Campus		-					
	chnology Campus			D				
9 Reload	TO9 Reload			Description of				
е Мар				(natural soil, pl				
				Firm to stiff light brown mottled gre	ey sandy gravelly CLAY		(ata)	150 17025
								IVNAB
						ligst	TESTING	
450 mm							Ltd.	GET WALLES WE SCOTE HELL NO. 1231
BS 1377: Part 9: 1990 Test4 - Incremental Loading Test						51.023	\smile	
Eyane				Depth	<u>0.00</u> m	ı bgl		
11/2019								
50	100	150	200	250	300	350	400	450
				_				
						7		
			Pressure (kN	/m2)			-	
r ()	m p) mm (377: Part 9: 1990 Te owe 11/2019	m p) mm (377: Part 9: 1990 Test4 - Incremental I owe 11/2019	m p n m m m 377: Part 9: 1990 Test4 - Incremental Loading Test owe 11/2019 Pressur	m	Easting (m) Northing (m) Ground Level (Sample Ref No Depth Pressure / Settlement 50 100 150 200 250	Easting (m) Northing (m) Ground Level (mOD) Sample Ref No. N/A Depth O.000 mr	Easting (m) 698835.693 Northing (m) 734298.251 Ground Level (mOD) 51.023 Sample Ref No. N/A Depth 0.00 m bgl	Easting (m) 698835.693 1

PRCEINED. 78/07/20

PLATE 7	TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve					
Reference No. Contract	R107342 22150 - Liffey Park Technology Campus		Description of	soil under test				
Test No.	PT10 Load		(natural soil, placed fill, sub-base)					
Location	See Map		Firm brown sa					
Depth	0.4m			., 5 , .			IVNAB	
Client	Arup		Easting (m)		699053.493	LCGI	ACCREDITED TESTING	
Plate Diameter:	450 mm		Northing (m)		734505.499	\IGSL	OFTAILER M SCORE HER NO. 1331	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Lo	oading Test	Ground Level		48.577			
Technician	S.Cunningham		Sample Ref No					
Authorised by Date	31/10/2019		Depth	0.00 r	n bgl			
0	50	Pressure / Sett	150	200	250	1	300	
0.00		100	150	200	250			
-0.50								
-1.00								
E -1.50								
± -2.00								
-2.50 -2.50 -2.50 -2.50 -3.00 -3.00 -3.00								
-3.00 -3.00								
-3.50								
-4.00								
-4.50		Pres	ssure (kN/m2)					
	mm settlement intersection = 74 ade reaction = 47 MPa/m	Favirole	ent CBR value in accordance	A LIBA LIBA E		7.7 %		

PRORINGO TOO TOO

	TEST REPORT SHEET	(F3.1)			Applied Pressure/Settlement Curve					
Reference No. Contract Fest No. Location Depth Client Plate Diameter: Fest Method Fechnician Authorised by	R107342 22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test S.Cunningham					aced fill, sub-base) dy gravelly CLAY mOD) N/A	699053.493 734505.499 48.577	I G S L	IVN ABA	
0	50	100	Pr 150	essure / Settleme	25 0	300	350	400	450	
-0.50										
				•						

PRICENED. 78/07/2023

Appendix 6

TRL DCP Probe Records

Report No. 22150 19 | P a g e

IGSL Field Records and Temps (F20)

Contract Liffey Park Technology Campus

Client Arup Contract No. 22150

Date:19/11/2019

Start of Test at:

Test No. PC

DCP Zero Reading

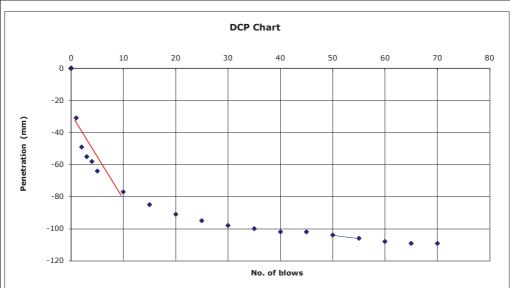
255 mm 0.0 m bgl

Location : See map (road)

Layer No:

Co ordinates: E: 698398.96 N: 735199.588 Elv: 56.555 Soil Description: Grey sandy GRAVEL (roadbase)

		Reading			Reading	No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	255						
1	1	286						
1	2	304						
1	3	310						
1	4	313						
1	5	319						
5	10	332						
5	15	340						
5	20	346						
5	25	350						
5	30	353						
5	35	355						
5	40	357						
5	45	357						
5	50	359						
5	55	361						
5	60	363						
5	65	364					1	
5	70	364					1	
							1	



Start Depth 0.0

m bgl

* Penetration range (mm) Blows

** From 77 31

Penetration 46

mm / blow

5

TRRL RN8

Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

Log10(CBR) = 1.731

> CBR = 53.8

IGSL Field Records and Temps (F20)

Date:19/11/2019

Start of Test at:

Contract

Client Arup Contract No. 22150

DCP Zero Reading 270 mm

0.0

m bgl

Location: See map (road)

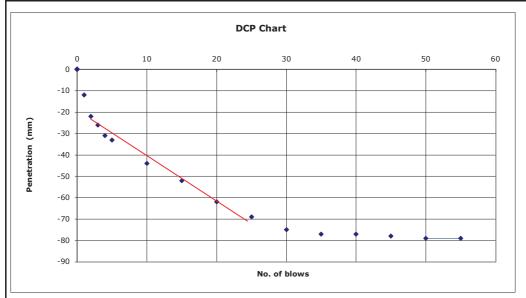
Layer No:

Co ordinates: E: 698641.601 N: 735176.16 Elv: 55.572

Liffey Park Technology Campus

Soil Descrip	otion:	Grey	sandy	GRAVEL	(roadbase)
OUII DUSCIII	otioii.	O. C.y	Juliuy	CIVALE	(I Ouubusc)

		Reading				No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	270						
1	1	282						
1	2	292						
1	3	296						
1	4	301						
1	5	303						
5	10	314						
5	15	322						
5	20	332						
5	25	339						
5	30	345						
5	35	347						
5	40	347						
5	45	348						
5 5	50	349						
5	55	349						



Start Depth 0.0

m bgl

* Penetration range (mm) Blows

** From 69

Penetration 47 23

mm / blow

2

TRRL RN8

Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

Log10(CBR) = 2.152

> CBR = 141.9

Test No. PC/12

IGSL Field Records and Temps (F20)

Liffey Park Technology Campus Contract

Client Arup Contract No. 22150

Date:19/11/2019

Test No. PC63

mm

DCP Zero Reading

Start of Test at: 0.0 m bgl

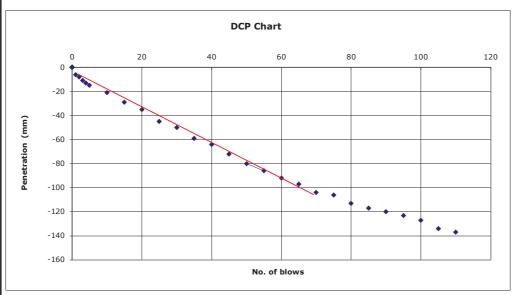
267

Location : See map (road)

Layer No:

Co ordinates: E: 698807.659 N: 735053.219 Elv: 51.137 Soil Description: Grey sandy GRAVEL (roadbase)

		Reading		·	Reading	No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	267	5	85	384			
1	1	273	5	90	387			
1	2	275	5	95	390			
1	3	278	5	100	394			
1	4	280	5	105	401			
1	5	282	5	110	404			
5	10	288						
5	15	296						
5	20	302						
5	25	312						
5	30	317						
5	35	326						
5	40	331						
5	45	339						
5	50	347						
5	55	353						
5	60	359						
5	65	364						
5	70	371						
5	75	373						
5	80	380						



Start Depth 0.0 m bgl

* Penetration range (mm) Blows

** From Penetration 8 104 96 68

mm / blow 1

TRRL RN8 Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

> Log10(CBR) = 2.322

> > CBR = 209.7

IGSL Field Records and Temps (F20)

Liffey Park Technology Campus Contract

Client Arup Contract No. 22150

Date:19/11/2019

Start of Test at:

Test No. PC#4A

DCP Zero Reading

mm 0.0 m bgl

297

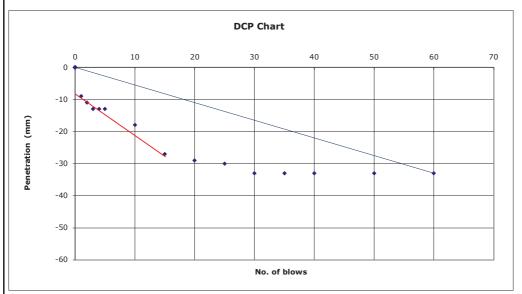
Location : See map (road)

Layer No:

Co ordinates: E: 699043.162 N: 735143.298 Elv: 50.4

Soil Description: Grey sandy GRAVEL (roadbase)

		Reading				No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	297						
1	1	306						
1	2	308						
1	3	310						
1	4	310						
1	5	310						
5	10	315						
5	15	324						
5	20	326						
5	25	327						
5	30	330						
5	35	330						
5	40	330						
10	50	330						
10	60	330						
							1	
							1	



Start Depth 0.0 m bgl

* Penetration range (mm) Blows

** From Penetration 27 9

18

14

mm / blow

1

TRRL RN8 Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

> Log10(CBR) = 2.365

> > CBR = 231.5

IGSL Field Records and Temps (F20)

Contract Liffey Park Technology Campus

Client Arup Contract No. 22150

Date:19/11/2019

Test No. PC/4B

DCP Zero Reading

Start of Test at: 0.0

293

mm

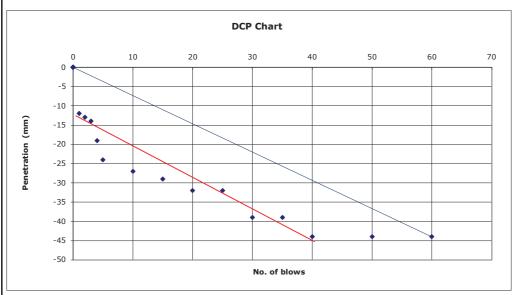
m bgl

Location : See map (road)

Layer No:

Co ordinates: E: 699043.162 N: 735143.298 Elv: 50.4 Soil Description: Grey sandy GRAVEL (roadbase)

		Reading			Reading	No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	293						
1	1	305						
1	2	306						
1	3	307						
1	4	312						
1	5	317						
5	10	320						
5	15	322						
5	20	325						
5	25	325						
5	30	332						
5	35	332						
5	40	337						
10	50	337						
10	60	337						



Start Depth 0.0 m bgl

* Penetration range (mm) Blows

** From Penetration 12 44 32 40 39

mm / blow 1

TRRL RN8 Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

> Log10(CBR) = 2.571

> > CBR = 372.2

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)

Contract Liffey Park Technology Campus

Client Arup Contract No. 22150

Date:19/11/2019

DCP Zero Reading

Test No. PC%5.

Location : See map (road) Layer No:

Start of Test at:

0.0 m bgl

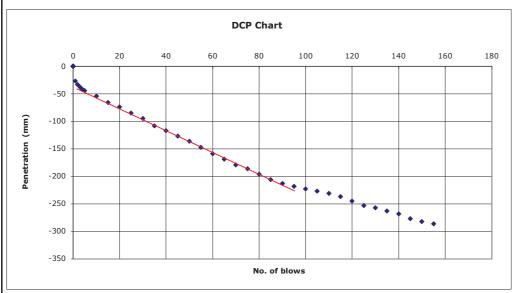
mm

153

Co ordinates: E: 699019.198 N: 734293.126 Elv: 48.965

Soil Description: Grey sandy GRAVEL (roadbase)

		Reading			Reading	No of	Total	Reading
No of Blows	Total Blows	mm	No of Blows	Total Blows	mm	Blows	Blows	mm
0	0	153	5	85	359			
1	1	180	5	90	366			
1	2	186	5	95	371			
1	3	191	5	100	376			
1	4	195	5	105	380			
1	5	197	5	110	384			
5	10	207	5	115	390			
5	15	219	5	120	398			
5	20	227	5	125	406			
5	25	238	5	130	410			
5	30	248	5	135	416			
5	35	261	5	140	421			
5	40	270	5	145	430			
5	45	280	5	150	435			
5	50	289	5	155	439			
5	55	300						
5	60	312						
5	65	322						
5	70	332						
5	75	339						
5	80	349						



Start Depth 0.0 m bgl

* Penetration range (mm) Blows

** From Penetration 42 218 176 91

mm / blow 2

TRRL RN8 Log10 (CBR) = 2.48-1.057*Log10 (mm/blow)

> Log10(CBR) = 2.177

> > CBR = 150.4

PRICENED. 78/07/2023

Appendix 7

Groundwater Monitoring

Report No. 22150 20 | P a g e

Groundwater Monitoring in Standpipes

Site Location Liffey Park Technology Campus

Project No. 22150

Client

Engineer Arup



			Date of	Monitorin	g					
			12/	11/2019	25/11	/2019	05/12	/2019		
Exploratory Hole No.	round Level (m OD	Standpipe	(m bgl)	(m OD)	(m bgl)	(m OD)	(m bgl)	(m OD)	(m bgl)	(m OD)
BH01	55.973	SP 50mm	0.50	55.47	0.49	55.48	0.51	55.46		
BH04	52.579	SP 50mm	0.51	52.07	0.54	52.04	0.56	52.02		
ВН06	50.683	SP 19mm	1.53	49.15	1.59	49.09	1.58	49.10		
BH12	49.451	SP 50mm	2.38	47.07	2.49	46.96	2.41	47.04		

PRICENED. 78/07/2023

Appendix 8 Geotechnical Laboratory Testing

Report No. 22150 21 | P a g e

IGSL Ltd Materials Laboratory Unit J5, M7 Business Park Newhall, Naas Co. Kildare 045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits



Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

Report No. R108602 Contract No. 22150 Contract Name: Liffey Park Technology Park , Leixlip Co.Kildare

Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Samples Received: 09/01/20 Date Tested: 9/1/20

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample	Moisture	Liquid	Plastic	Plasticity	%	Preparation	Liquid Limit	Classification (BS5930)	Description
				Type	Content %	Limit %	Limit %	Index	<425μm		Clause	(100000)	
BH05	AA120053	1.0	A19/5945	В	18								Brown sandy gravelly SILT/CLAY
BH05	AA120054	2.0	A19/5946	В	17								Brown sandy gravelly SILT/CLAY
BH07	AA120063	1.5	A19/5947	В	13								Brown sandy gravelly SILT/CLAY
BH11	AA120060	2.0	A19/5948	В	16								Grey/brown sandy gravelly SILT/CLAY
BH11	AA120061	3.0	A19/5949	В	24								Grey/brown sandy gravelly SILT/CLAY
BH08	AA120069	2.0	A19/5950	В	9.1								Grey/black very gravelly SILT/CLAY
BH10	AA120074	1.4	A19/5951	В	13								Brown sandy gravelly SILT/CLAY

Remarks:

Notes: Preparation: WS - Wet sieved

Liquid Limit

Clause:

AR - As received

NP - Non plastic

4.3 Cone Penetrometer definitive method

4.4 Cone Penetrometer one point method

Sample Type: B - Bulk Disturbed

U - Undisturbed

Results apply to the sample as received.

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Laboratory Manager)

 Approved by
 Date
 Page

 24/01/20
 1 of 1

IGSL Ltd Materials Laboratory Unit J5, M7 Business Park Newhall, Naas Co. Kildare 045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits



Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

Report No. R108603 Contract No. 22150 Contract Name: Liffey Park Technology Park , Leixlip Co.Kildare

Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Samples Received: 09/01/20 Date Tested: 9/1/20

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425μm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
TP01	AA123647	1.1	A19/5952	В	11	33	17	16	60	WS	4.4	CL	Grey/brown sandy gravelly CLAY
TP01	AA123648	1.4	A19/5953A	В	13	33	15	18	58	WS	4.4	CL	Grey/brown sandy gravelly CLAY
TP02	AA118622	0.7	A19/5953B	В	16								Grey/black sandy gravelly SILT/CLAY
TP02	AA118624	1.7	A19/5954	В	17								Dark brown very gravelly sandy SILT/CLAY
TP03	AA108755	0.7	A19/5955	В	6.0								Black/grey slightly clayey/silty, sandy, GRAVEL
TP03	AA108756	1.5	A19/5956	В	15	36	22	14	23	WS	4.4	СІ	Dark grey sandy gravelly CLAY
TP04	AA123643	0.7	A19/5957	В	15	28	16	12	63	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY
TP04	AA123644	1.2	A19/5958	В	14	32	17	15	56	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY
TP04	AA123645	1.7	A19/5959	В	11	31	16	15	45	WS	4.4	CL	Black/brown slightly sandy, gravelly, CLAY
TP05	AA116285	1.1	A19/5960	В	13	33	17	16	57	WS	4.4	CL	Brown sandy gravelly CLAY
TP05	AA116286	2.2	A19/5961	В	15	37	25	12	31	WS	4.4	МΙ	Grey/brown sandy gravelly SILT
TP06	AA108760	0.8	A19/5962	В	13	28	14	14	50	WS	4.4	CL	Brown slightly sandy, slightly gravelly, CLAY
TP06	AA108761	1.7	A19/5963	В	15	33	19	14	54	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY
TP07	AA116289	1.0	A19/5965	В	21	·							Brown sandy gravelly SILT/CLAY
TP08	AA116275	1.5	A19/5966	В	12	35	18	17	50	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY

Remarks:

Notes: Preparation: WS - Wet sieved

Liquid Limit

AR - As received

NP - Non plastic

4.3 Cone Penetrometer definitive method

Clause: 4.4 Cone Penetrometer one point method

Sample Type: B - Bulk Disturbed

U - Undisturbed

Results apply to the sample as received.

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Laboratory Manager)

 Approved by
 Date
 Page

 24/01/20
 1 of 1

IGSL Ltd Materials Laboratory Unit J5, M7 Business Park Newhall, Naas Co. Kildare 045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits



Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

Liffey Park Technology Park , Leixlip, Co.Kildare Report No. R108604 Contract No. 22150 Contract Name:

Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Samples Received: 09/01/20 Date Tested: 9/1/20

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425μm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
TP08	AA116277	2.3	A19/5962	В	9.4	30	15	15	52	WS	4.4	CL	Dark brown slightly sandy, gravelly, CLAY
TP09	AA116279	0.7	A19/5968	В	14	29	17	12	40	WS	4.4	CL	Grey/brown sandy gravelly CLAY
TP09	AA116283	2.5	A19/5969	В	13	26	14	12	35	WS	4.4	CL	Grey/brown sandy gravelly CLAY
TP10	AA118606	0.8	A19/5970	В	19	34	18	16	63	WS	4.4	CL	Brown slightly sandy, slightly gravelly, CLAY
TP10	AA118607	1.6	A19/5971	В	10	35	20	15	51	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY with many cobbles
TP11	AA118616	1.5	A19/5972	В	25								Brown very sandy, slightly gravelly, SILT/CLAY
TP11	AA118617	2.6	A19/5973	В	14	36	20	16	58	WS	4.4	СІ	Dark brown sandy gravelly CLAY
TPSA01	AA128606	0.5	A19/5974	В	31	49	23	26	74	WS	4.4	СІ	Brown slightly sandy, slightly gravelly, CLAY
TPSA01	AA128608	1.5	A19/5975	В	25	46	22	24	70	WS	4.4	СІ	Mottled brown slightly sandy, slightly gravelly, CLAY
TPSA02	AA118610	1.3	A19/5976	В	33	50	30	20	86	WS	4.4	МΙ	Brown slightly sandy, slightly gravelly, SILT
TPSA02	AA118611	1.8	A19/5977	В	12	33	17	16	60	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY
TPSA03	AA118602	0.8	A19/5978	В	12	33	17	16	59	WS	4.4	CL	Brown slightly sandy, slightly gravelly, CLAY
TPSA03	AA118603	1.7	A19/5979	В	17	34	18	16	67	WS	4.4	CL	Brown slightly sandy, gravelly, CLAY
TPSA04	AA128602	0.6	A19/5980	В	24								Brown slightly sandy, slightly gravelly, SILT/CLAY
TPSA04	AA128604	2.2	A19/5981	В	14	42	21	21	61	WS	4.4	СІ	Brown slightly sandy, gravelly, CLAY

Notes: Preparation:

Clause:

WS - Wet sieved

AR - As received

NP - Non plastic

Liquid Limit

4.3 Cone Penetrometer definitive method 4.4 Cone Penetrometer one point method Sample Type: B - Bulk Disturbed

U - Undisturbed

Remarks:

Results apply to the sample as received.

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Laboratory Manager)

Approved by

Date 24/01/20

1 of 1

Page

IGSL Ltd **Test Report** Materials Laboratory Unit J5. M7 Business Park Determination of Moisture Content, Liquid & Plastic Limits Newhall, Naas Co. Kildare Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3 045 846176 Liffey Park Technology Park, Leixlip Co.Kildare Report No. R108605 Contract No. 22150 Contract Name: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4 Samples Received: 09/01/20 Date Tested: 09/01/20 BH/TP Sample No. Depth (m) Lab. Ref Moisture **Plastic Plasticity** % Sample Liquid Preparation Liquid Limit Content % Limit % Type Limit % Index <425µm Clause AA128605 2.6 A19/5982 34 14 92 WS 4.4 TPSA04 17 20

Opinions and interpretations are outside the scope of accreditation.

Results apply to the sample as received.

Remarks:

The results relate to the specimens tested. Any remaining material will be retained for one month.

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Classification

CL

Description

Dark brown slightly sandy, gravelly, CLAY

IGSL Ltd Materials Laboratory

WS - Wet sieved

AR - As received

NP - Non plastic

4.3 Cone Penetrometer definitive method

4.4 Cone Penetrometer one point method

Notes:

Preparation:

Liquid Limit

Clause:

Persons authorized to approve reports

H Byrne (Laboratory Manager)

U - Undisturbed

Sample Type: B - Bulk Disturbed

A Byene

Approved by

Date Page 24/01/20 1 of 1

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5 (note: Sedimentation stage not accredited)



Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

		1					2400075			
particle	%			Contract No:	22150	Report No.	R108675		VO. 78/07/2023	
size	passing			Contract:	-	echnology Par	rk		00	
75	100	COBBLES		BH/TP:	TP03				2	
63	100			Sample No.	AA108755	Lab. Sample	No.	A19/5955	2	
50	100			Sample Type:	В					
37.5	79			Depth (m)	0.70	Customer:	Arup, 50 Ringsen	d Rd, Grand Cai	nal Dock, Dublin 4	
28	41			Date Received	09/01/2020	O Date Testin	g started	09/01/2020		
20	20			Description:	Black/grey s	lightly clayey/	silty, sandy, GRAV	EL		
14	16	GRAVEL								
10	13	GRAVLL		Remarks	Note: Clause 9.2 and Clause 9.5	5 of BS1377:Part 2:1990 have bee	n superseded by ISO17892-4:2016 . Results a	pply to sample as received.	Sample size did not meet the requirements of BS1377	
6.3	10						55	8 2.75		ı.
5	9						0.063	0.425 0.6 1.18	2 3.35 5.3 6.3 10 14 20	23. 23. 53.
3.35	7		100 -							
2	6		90 -							
1.18	5		80 -							
0.6	4		<u>%</u> 70 -							
0.425	3	SAND	isi 60 -							
0.3	3		sed = 50 -							
0.15	2		age							/
0.063	1		en 40 -						<u> </u>	
			Percentage passing (%) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					 	 	
			_ 20 -							
			10 -							
		SILT/CLAY	0 -							
			0.0	0.00	1	0.01	0.1	1	10	100
					CLAY	SILT	Sieve size (mm)	SAND	GRAVEL	
		100: *					Approved by:		Date:	Page no:
		IGSL L	td Mater	ials Laboratoi	'y		A Regare		24/01/20	1 of 1

Determination of Particle Size Distribution

Tested in accor se 9.2 & 9.5

ordance	with:	BS13	77:Pa	rt2:	1990,	, clause
(note: S	edimen	tation	stage	not a	accredit	ted)



24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

1 of 1

particle	%		Contract No:	22150	Report No.	R109127	78/07/2023	
size	passing		Contract:	Liffey Park T	echnology Par	·k	0	
75	100	COBBLES	BH/TP:	TP04				
63	100	CODDLLS	Sample No.	AA123643	Lab. Sample	No. A19/595	7 ~~~	
50	100		Sample Type:	В				
37.5	93		Depth (m)	0.70	Customer:	Arup, 50 Ringsend Rd, Gra	nd Canal Dock, Dublin 4	
28	90		Date Received	09/01/2020	Date Testing	g started 09/01/2	2020	
20	84		Description:	Brown slightl	y sandy, grav	elly, CLAY		
14	77	GRAVEL						
10	75	GIVAVLL	Remarks	Note: Clause 9.2 and Clause 9.5	of BS1377:Part 2:1990 have been	n superseded by ISO17892-4:2016 . Results apply to sample as received		
6.3	68					0.15 0.15 0.3 0.6	1.18 2 3.35 5.5 6.3 10	28 37.5 550 75 75
5	66		100			0.063 0.15 0.3 0.425 0.6	1.1 2 3.3 3.3 10 10 14 120	378
3.35	61		100					
2	52		90					
1.18	46		80					
0.6	40		70					
0.425	39	SAND	ig 60					
0.3	38		50					
0.15	35		t 40				<u> </u>	
0.063	31		Dercentage passing (%) 60 40 30					
0.037	29		Per 30					
0.027	27		20					
0.017	24	SILT/CLAY	10					
0.010	21	SIL I / CL/ (I	0 1					
0.007	18		0.0001 0.0	001	0.01	0.1 1	10	100
0.005	14			CLAY	SILT	Sieve size (mm) SAND	GRAVEL	
0.002	9							
		ICCL T	tal Mataviala I alayat			Approved by:	Date:	Page no:

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

U	ruanc	e	with:	DO 1	3/	7:P	ar LZ:	. 1 9	90	, Clè	11
(note:	Se	dimer	tatio	n s	stage	e not	acc	redi	ted)	



24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

1 of 1

								1.(1)	
particle	%		Contract No:	22150	Report No.	R108653		D. 78/07/2023	
size	passing		Contract:	Liffey Park Te	echnology Par	k		0	
75	100	COBBLES	BH/TP:	TP04					
63	100	COBBLES	Sample No.	AA123644	Lab. Sample	No.	A19/5958	, O ²	
50	100		Sample Type:	В				0	
37.5	97		Depth (m)	1.20	Customer:	Arup, 50 Ringser	nd Rd, Grand Ca	anal Dock, Dublin 4	
28	97		Date Received	09/01/2020) Date Testing	g started	09/01/2020		
20	85		Description:	Brown slightly	y sandy, grave	elly, CLAY			
14	83	GRAVEL							
10	79	GRAVEL	Remarks	Note: Clause 9.2 and Clause 9.5 c	of B\$1377:Part 2:1990 have been	superseded by ISO17892-4:2016 . Results ap	ply to sample as received.		
6.3	75					53	8 8	3 35	ι
5	72					0.063	0.425 0.6 1.18	2 3.35 5.3 10 14 20	28 37.5 53 63 75
3.35	69		100						
2	64		90					 	
1.18	60		80						
0.6	55		70						
0.425	53	SAND	in sing 60					 	
0.3	51		50						
0.15	46		age to 40						
0.063	41		🚡						
0.037	35		g 30 +						
0.026	33		20						
0.017	28	SILT/CLAY	10	# # #					+++++
0.010	23	SIL I / CLAI	0 -	11111				1 11 11 11 11	<u> </u>
0.007	19		0.0001	0.001	0.01	0.1	1	10	100
0.005	16			CLAY	SILT	Sieve size (mm)	SAND	<i>GRAVEL</i>	
0.002	11								
		ICCL T	tal Mataviala I alaava	.		Approved by:		Date:	Page no:

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5 (note: Sedimentation stage not accredited)

ISO 17025 NAB
TESTING
DETAILED IN SCOPE REG NO. 133

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

							(1)	
particle	%		Contract No:	22150 Rep	ort No. R108676		*D. 78/07/2023	
size	passing		Contract:	Liffey Park Techno	logy Park		0	
75	100	COBBLES	BH/TP:	TP04				
63	100	CODDLES	Sample No.	AA123645 Lab	. Sample No.	A19/5959	,05	
50	100		Sample Type:	В			0	
37.5	96		Depth (m)	1.70 Cus	tomer: Arup, 50 Ringse	nd Rd, Grand Ca	anal Dock, Dublin 4	
28	92		Date Received	09/01/2020 Dat	e Testing started	09/01/2020		
20	82		Description:	Black/brown slight	ly sandy, gravelly, CLAY			
14	80	GRAVEL						
10	75	GRAVEL	Remarks	Note: Clause 9.2 and Clause 9.5 of BS1377:Pa	art 2:1990 have been superseded by ISO17892-4:2016 . Results a	uply to sample as received.		
6.3	67				53	8 8	3 35	τċ
5	63		100		0.063	0.425 0.6 1.18	2 3.35 6.3 10 20 20	550.27.
3.35	60		100					
2	54		90				 	
1.18	50		80					
0.6	45		70					
0.425	43	SAND	in sign of the second s					
0.3	40		Dercentage passing (%) 00 00 00 00 00 00 00 00 00					
0.15	35		t 40					
0.063	30		30					
0.038	27		P 20					
0.027	24		20					
0.018	20	SILT/CLAY	10	 				
0.010	18	SIL 17 CL/ (1	0	 				
0.007	17		0.0001 0.	0.01	0.1	1	10	100
0.005	15			CLAY	S/LT Sieve size (mm)	SAND	<i>GRAVEL</i>	
0.002	12						I	
		ICSL T	td Materials Laborat	orv	Approved by:			Page no:
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Determination of

Tested in accordance with: (note: Sedimen

EST REPORT f Particle Size Distribution : BS1377:Part2:1990 , clause 9.2 & 9.5	PRICA	ISO 17025 NAB ACCREDIED TESTING
ntation stage not accredited)		DETAILED IN SCOPE REG NO. 1337

particle	%		Contract No: 22150 Report No. R108714 Contract: Liffey Park Technology Park BH/TP: TP06 Sample No. AA108760 Lab. Sample No. A19/5962 Sample Type: B
size	passing		Contract: Liffey Park Technology Park
75	100	COBBLES	BH/TP: TP06
63	100	CODDLLS	Sample No. AA108760 Lab. Sample No. A19/5962
50	100		Sample Type: B
37.5	100		Depth (m) 0.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
28	98		Date Received 09/01/2020 Date Testing started 10/01/2020
20	93		Description: Brown slightly sandy, slightly gravelly, CLAY
14	87	GRAVEL	
10	84	GRAVEL	Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by IS017892-4:2016 . Results apply to sample as received.
6.3	78		5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
5	75		0.063 0.425 0.425 0.425 0.663 1.18 1.18 1.19 1.10 1.10 1.10 1.10 1.00 1.00 1.00
3.35	72		
2	68		
1.18	64		
0.6	59		8 70
0.425	57	SAND	
0.3	54		
0.15	49		
0.063	43		
0.037	37		
0.026	35		
0.017	32	SILT/CLAY	
0.010	24	SIL1/CLAT	
0.007	20		0.0001 0.001 0.01 1 1 10 100
0.005	18		CLAY SILT Sieve size (mm) SAND GRAVEL
0.002	14		
			Approved by: Date: Page no:

IGSL Ltd Materials Laboratory

Approved by:		Date:	Page no:	
	A Byene	24/01/20	1 of 1	

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5 (note: Sedimentation stage not accredited)



Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

Particle 96 98 Contract No: 22150 Report No. R108654	-	ı	T .			
37.5 94 Depth (m)	particle	%		Contract No:	22150 Report No. R108654	
37.5 94 Depth (m)		passing		Contract:	Liffey Park Technology Park	
37.5 94 Depth (m)	75	100	COBBLES	BH/TP:	TP06	
37.5 94 Depth (m)	63	100	0055220	Sample No.	AA108761 Lab. Sample No. A19/5963	
28 91 Date Received Description: Brown slightly sandy, gravelly, CLAY 10 79 GRAVEL Remarks Sent Class 2 in Class 1 in Class 2 in Class 2 in Class 1 in Class 2 in Class 1 in Class 2 in	50	94		Sample Type:	В	
20 82 14 82 10 79 6.3 75 5 72 3.35 67 2 62 1.18 58 0.6 53 0.425 51 SAND 0.15 45 0.063 40 0.017 29 0.010 27 0.007 25 0.0007 25 0.0002 16 Description: Brown slightly sandy, gravelly, CLAY Description: Brown slightly sandy, gravelly, CLAY Description: Brown slightly sandy, gravelly, CLAY Remarks Descri	37.5	94		Depth (m)	1.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4	
14 82 10 79 GRAVEL Remarks 1980 1980 1980 1980 1980 1980 1980 1980	28	91		Date Received		
CSL td Materials Sharps	20	82		Description:	Brown slightly sandy, gravelly, CLAY	
10	14	82	GRAV/FI			
5 72 3.35 67 2 62 1.18 58 0.6 53 0.425 51 SAND 0.15 45 0.063 40 0.037 37 0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SCILT/CLAY CLAY SILT Sieve size (mm) SAND GRAVEL Approved by: Date: Page no:	10	79	GIVIVEE	Remarks	Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by IS017892-4:2016 . Results apply to sample as received.	
3.35 67 2 62 1.18 58 0.6 53 0.425 51 0.3 49 0.15 45 0.063 40 0.037 37 0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 CLAY S/LT Sieve size (mm) SAND GRAVEL	6.3	75			66 63 35 35 35 35 35 35 35 35 35 35 35 35 35	
2 62 1.18 58 0.6 53 0.425 51 SAND 0.15 45 0.063 40 0.007 25 0.010 27 0.010 27 0.007 25 0.005 21 0.002 16 CLAY SILT Sieve size (mm) SAND GRAVEL		72		100	0.0 0.0 1. 2 8.0 2.7 2.8 2.8 2.8 2.9 2.4 2.9 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8	22
1.18 58 0.6 53 0.425 51 SAND 0.90 0.005 21 0.007 25 0.002 16 SILT/CLAY 0.005 21 0.002 16 SILT/CLAY 0.007 16 SILT/CLAY 0.007 16 SILT/CLAY 0.007 0	3.35					
0.6 53						
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL				80		
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL	0.6	53		0 70		###
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL			SAND	risk 60		
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL				<u>ω</u> 50		
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL				40 t ag		
0.027 34 0.017 29 0.010 27 0.007 25 0.005 21 0.002 16 SILT/CLAY SILT Sieve size (mm) SAND GRAVEL				20 30		
0.017 29 0.010 27 0.007 25 0.0001 0.001 0.01 0.1 1 10 100 100 100				B 30		
0.017 25 SILT/CLAY 0 0.001 0.001 0.01 0.1 1 10 100 0.005 21 CLAY S/LT Sieve size (mm) SAND GRAVEL 0.002 16 Approved by: Date: Page no:						
0.010 27 0.007 25 0.0001 0.001 0.01 0.1 0.002 16 Approved by: Date: Page no: P			SILT/CLAY	10 1		
0.007 23 0.005 21 0.002 16 CLAY SILT Sieve size (mm) SAND GRAVEL Approved by: Date: Page no:						100
0.002 16 Approved by: Date: Page no:				0.0001		100
Approved by: Date: Page no:					CLAY SILT Sieve size (mm) SAND GRAVEL	
ICSL I to Materials I aboratory	0.002	16				
24/01/20 1 of 1			IGSL I t	d Materials I abora	otory	
			1002 5	ta Piatorialo Easora	24/01/20 1	of 1

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5 (note: Sedimentation stage not accredited)

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	DETAILED IN SCOPE REG NO. 133

24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

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		_			<u> </u>
particle	%		Contract No: 22150	Report No. R108655	18 ₀ 23
size	passing		•	c Technology Park	
75	100	COBBLES	BH/TP: TP08		
63	100		Sample No. AA1162	5 Lab. Sample No. A19/5966	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
50	93		Sample Type: B		
37.5	83		Depth (m) 1.50	Customer: Arup, 50 Ringsend Rd, Grand C	anal Dock, Dublin 4
28	79		Date Received 09/01/2	020 Date Testing started 09/01/2020	
20	69		Description: Brown sli	htly sandy, gravelly, CLAY	
14	66	GRAVEL			
10	63	GRAVEL	Remarks Note: Clause 9.2 and C	use 9.5 of BS1377:Part 2:1990 have been superseded by IS017892-4:2016 . Results apply to sample as received.	
6.3	59			33 33 3 3 8	55 5.
5	58			0.063 0.15 0.3 0.425 0.6	2 3.35 6.3 10 14 20 28 37.5 53 63
3.35	55		100		
2	51		90		┨┈╫┼┼╫╫╫
1.18	48		80	 	╂┈╫┼┼╫┼╫┈┼┈┼┈╁╢┼╂╫╫┨
0.6	45		§ 70 		++++++++++++++++++++++++++++++++++++
0.425	43	SAND	ouis 60		
0.3	41		50		
0.15	37		age to 40		
0.063	33		□		
0.038	28				
0.027	25		20		
0.017	23		10	 	
0.010	20	SILT/CLAY	0	<u> </u>	
0.007	18		0.0001 0.001	0.01 0.1 1	10 100
0.005	15		CLAY	S/LT Sieve size (mm) SAND	GRAVEL
0.002	12				
		1001 1	Matariala I alcanatam.	Approved by:	Date: Page no:

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

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(note:	Sedimen	tation	stage	not	accredi	ited)



particle	%		Contract No:	22150	Report No.	R108677	1.0.	
size	passing		Contract:		echnology Park		. 7	18/0 ¹ /2023
75	100	COBBLES	BH/TP:	TP08				102
63	100	CORRES	Sample No.	AA116277	Lab. Sample I	No.	A19/5967	7 05
50	95		Sample Type:	В				6
37.5	82		Depth (m)	2.30	Customer:	Arup, 50 Ringse	nd Rd, Grand Canal Do	ock, Dublin 4
28	75		Date Received	09/01/2020	Date Testing	started	09/01/2020	
20	62		Description:	Dark brown s	slightly sandy, g	gravelly, CLAY		
14	58	GRAVEL						
10	55	GNAVLL	Remarks	Note: Clause 9.2 and Clause 9.5	of BS1377:Part 2:1990 have been su	uperseded by ISO17892-4:2016 . Results a	apply to sample as received.	
6.3	51					63	0.3 .425 0.6 1.18	3 5.083
5	49		100			0.063	0.3 0.425 0.6 1.18 2 3.35	5.3 10 10 10 10 10 10 10 10 10 10 10 10 10
3.35	47		100					
2	44		90					
1.18	42		80					
0.6	39		70					╎╏╫┼╫╶╏┈╏╱╫┈╫╶╏╫╫ ╏
0.425	37	SAND	70					
0.3	36		50					
0.15	32		96 t 40 t 40					
0.063	27		30					
0.037	24		Per 30					
0.027	21		20					
0.017	19	SILT/CLAY	10	 	1111 1 1	 	 	
0.010	16	JIL I / OL/ (I	0 1					
0.007	13		0.0001 0.0	001	0.01	0.1	1	10 100
0.005	11			CLAY	SILT	Sieve size (mm)	SAND	GRAVEL
0.002	8					A se se se el le co	Data	Dene

IGSL Ltd Materials Laboratory

Approved by: Date: Page no: 24/01/20 1 of 1

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5

(note: Sedimentation stage not accredited)



particle	%		Contract No:	22150	Report No.	R108678	970
size	passing		Contract:	Liffey Park Te	echnology Par	rk	0
75	100	COBBLES	BH/TP:	TP10			3
63	100	CODDLLS	Sample No.	AA118606	Lab. Sample	e No. A19/5	970
50	100		Sample Type:	В			9
37.5	89		Depth (m)	0.80	Customer:	Arup, 50 Ringsend Rd, 0	Grand Canal Dock, Dublin 4
28	83		Date Received	09/01/2020	Date Testin	g started 10/0°	1/2020
20	79		Description:	Brown slightly	y sandy, sligh	tly gravelly, CLAY	
14	76	GRAVEL					
10	75	GIVAVLL	Remarks	Note: Clause 9.2 and Clause 9.5 of	of BS1377:Part 2:1990 have bee	en superseded by ISO17892-4:2016 . Results apply to sample as re	received. Sample size did not meet the requirements of BS1377
6.3	71					63 15 25 5	2. 5: 3. 3. 3. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.
5	70		100			0.063 0.15 0.3 0.425 0.6	1.18 2 3.35 6.3 10 10 14 20 28 37.5 50 53
3.35	68		100				
2	66		90				
1.18	63		80				
0.6	61		70				
0.425	59	SAND	· · · · · · · · · · · · · · · · · · ·				
0.3	58		50				
0.15	54		96 t 40				
0.063	49		Dercentage passing (%) 00 00 00 00 00 00 00 00 00			´ 	
0.037	42		Per 30				
0.027	37		20				
0.017	33	SILT/CLAY	10	-			
0.010	29	JIL I / CL/ (I	0				
0.007	23		0.0001 0.0	01	0.01	0.1	1 10 100
0.005	19			CLAY	SILT	Sieve size (mm) SAND	GRAVEL
0.002	13						
		1001 1	tal Marka Mala Tala anaka			Approved by:	Date: Page no:

IGSL Ltd, M7 Business Park, Newhall, Naas, Co Kildare

IGSL Ltd Materials Laboratory

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

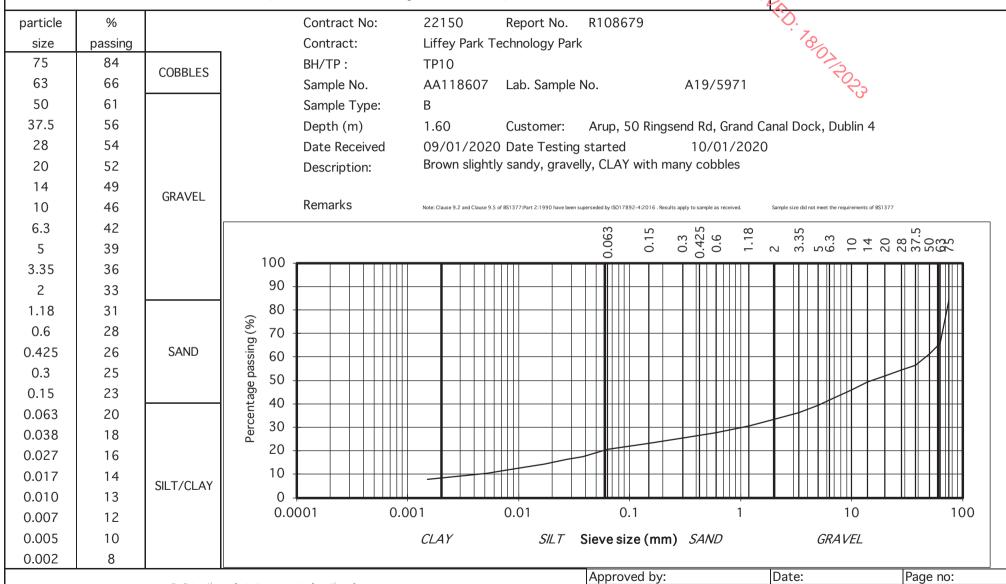
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1 of 1

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5

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24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

1 of 1

Determination

Tested in accordance v (note: Se

n of Particle Size Distribution	PA	IV
with: BS1377:Part2:1990 , clause 9.2 & 9.5	C	VETAILED IN SC
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24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

1 of 1

		1		***
particle	%		Contract No: 22150	Report No. R108922
size	passing		Contract: Liffey Park To	echnology Park
75	100	COBBLES	BH/TP: TP11	
63	100		Sample No. AA118616	Report No. R108922 echnology Park Lab. Sample No. A19/5972
50	100		Sample Type: B	
37.5	100		Depth (m) 1.50	Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
28	100		Date Received 09/01/2020	Date Testing started 17/01/2020
20	99		Description: Brown very s	andy, slightly gravelly, SILT/CLAY
14	97	CD AV/EI		
10	96	GRAVEL	Remarks Note: Clause 9.2 and Clause 9.5	of BS1377:Part 2:1990 have been superseded by IS017892-4:2016 . Results apply to sample as received.
6.3	96			3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3
5	95			0.063 0.15 0.425 0.6 1.18 1.0 1.0 1.0 2.0 2.0 2.0 2.0 2.0 2.0 6.3 3.3.5 5.0 6.3 6.3 7.5 6.3
3.35	94		100	
2	91		90	
1.18	89		<u> </u>	
0.6	82		§ 70 1	
0.425	78	SAND	%) 70	
0.3	71		50	
0.15	36		96 de 40 40 40 40 40 40 40 40 40 40 40 40 40	
0.063	25		40	
0.037	21		<u>0</u> 30	
0.027	19		20	
0.017	15		10	┼┼┼┈┈╎┈╎┈╟╟╎┈╏┈╏┈╏┈╏╎╟╎╏┈╏┈╏╏╏╏
0.010	12	SILT/CLAY	0	
0.007	10		0.0001 0.001	0.01 0.1 1 10 100
0.005	8		CLAY	S/LT Sieve size (mm) SAND GRAVEL
0.002	6			
		1001	1.54	Approved by: Date: Page no:
		17.01	d Matariala I abaratary	

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5 (note: Sedimentation stage not accredited)



Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

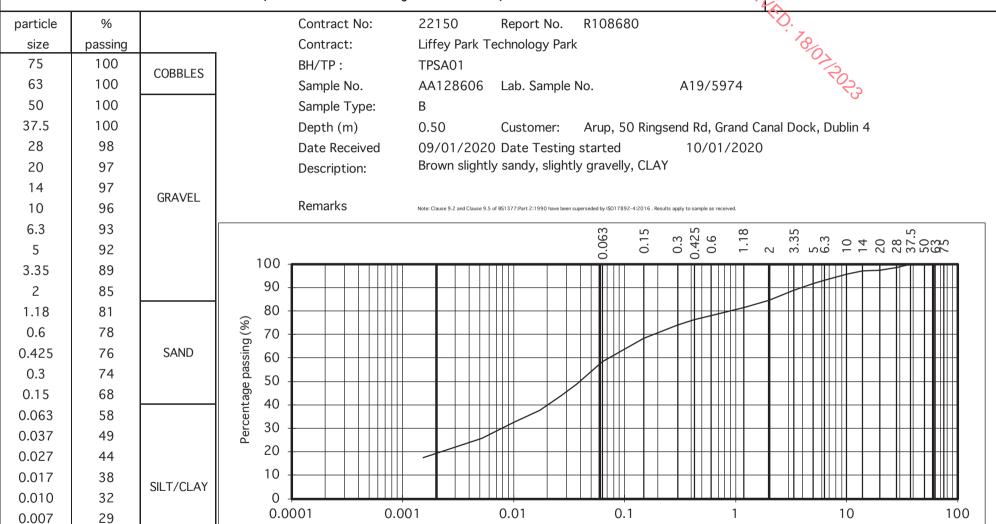
particle	%		Contract No:	22150 Rep	ort No. R108715	, S	78/07/2023				
size	passing		Contract:	Liffey Park Techno	ology Park		0				
75	100	COBBLES	BH/TP:	TPSA01							
63	100	CODDLLS	Sample No.	AA128608 Lab	. Sample No.	A19/5975	,05				
50	100		Sample Type:	В			0				
37.5	100		Depth (m)	1.50 Cus	tomer: Arup, 50 Rings	end Rd, Grand Canal [Dock, Dublin 4				
28	100		Date Received	09/01/2020 Dat	e Testing started	10/01/2020					
20	99		Description:	Mottled brown sli	ghtly sandy, slightly gravel	ly, CLAY					
14	97	GRAVEL									
10	94	GIVAVLL	Remarks	Note: Clause 9.2 and Clause 9.5 of BS1 377:	art 2:1990 have been superseded by ISO17892-4:2016 . Result	s apply to sample as received.					
6.3	91				0.15	0.3 .425 0.6 1.18		rċ			
5	89		100		0.063	0.3 0.425 0.6 1.18	3.35 6.3 10 20 20 28	7500.27			
3.35	86		100								
2	83		90								
1.18	80		80								
0.6	76		[∞] ₅ 70 								
0.425	74	SAND	%) 70								
0.3	71		50								
0.15	65		t 40								
0.063	57		30	 							
0.038	49		Per 30								
0.027	45		20								
0.017	39	SILT/CLAY	10								
0.010	33	0.2.7 027	0 1	001	1 01	1	10	100			
0.007	28		0.0001 0.	0.0	1 0.1	1	10	100			
0.005	23			CLAY	S/LT Sieve size (mm)) SAND	<i>GRAVEL</i>				
0.002	15				1.	T					
		IGSL TH	td Materials I ahorat	orv	Approved by:	Date		Page no:			
	IGSL Ltd Materials Laboratory										

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Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5

				•
1	Cadimanastas	****		A \
(note:	Sedimentation	stade	not	accredited)
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CLAY

IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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GRAVEL

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

Sieve size (mm) SAND

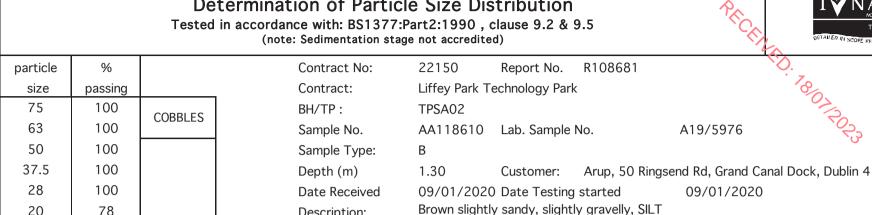
0.005

0.002

26

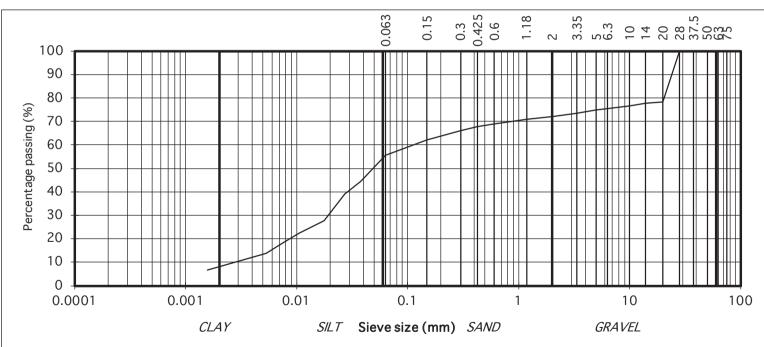
17

Determination of Particle Size Distribution



Description:

Remarks Note: Clause 9.2 and Clause 9.5 of RS1377:Part 2:1990 have been superseded by ISO17892-4:2016. Results apply to sample as received Sample size did not meet the requirements of BS1377



IGSL Ltd Materials Laboratory

Approved by: Page no: Date: A Byene 24/01/20 1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

78

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56

44

39

28

22

18

14

7

GRAVEL

SAND

SILT/CLAY

14

10

6.3

5

3.35

2

1.18

0.6

0.425

0.3

0.15

0.063

0.038

0.027

0.018

0.010

0.007

0.005

0.002

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

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24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

1 of 1

particle	%		Contract No:	22150	Report No.	R108682	*D. 78/07/2023
size	passing		Contract:	Liffey Park Te	echnology Par	·k	70
75	100	COBBLES	BH/TP:	TPSA02			
63	100	COBBLES	Sample No.	AA118611	Lab. Sample	No. A19/5977	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
50	94		Sample Type:	В			0
37.5	88		Depth (m)	1.80	Customer:	Arup, 50 Ringsend Rd, Grand	Canal Dock, Dublin 4
28	84		Date Received	09/01/2020	Date Testing	g started 09/01/202	20
20	69		Description:	Brown slightly	/ sandy, grave	elly, CLAY	
14	67	GRAVEL					
10	64	GRAVEL	Remarks	Note: Clause 9.2 and Clause 9.5 of	f B\$1377:Part 2:1990 have beer	n superseded by ISO17892-4:2016 . Results apply to sample as received.	
6.3	60					53 53	55 55
5	58		100			0.063 0.15 0.425 0.6 1.18	2 3.35 6.3 10 14 14 14 20 20 50 75 75 75
3.35	56		100				
2	53		90				
1.18	51		80				
0.6	47		70				
0.425	46	SAND	isg 60 -				
0.3	44		50 J				
0.15	40		t 40				
0.063	35						
0.037	29		G 30				
0.027	27		20				
0.017	24	SILT/CLAY	10				
0.010	20	JIL I / CLAI	0 -				
0.007	16		0.0001 0.0	001	0.01	0.1 1	10 100
0.005	15			CLAY	SILT	Sieve size (mm) SAND	GRAVEL
0.002	11						
		1001 1	ual Madaniala I alaanada			Approved by:	Date: Page no:

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5

(note: Sedimentation stage not accredited)



24/01/20

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

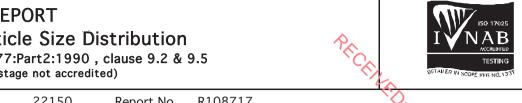
1 of 1

particle	%		Contract No: 22150 Report No. R108716
size	passing		Contract No: 22150 Report No. R108716 Contract: Liffey Park Technology Park BH/TP: TPSA03 Sample No. AA118602 Lab. Sample No. A19/5978 Sample Type: B
75	100	00001.50	BH/TP: TPSA03
63	100	COBBLES	Sample No. AA118602 Lab. Sample No. A19/5978
50	100		Sample Type: B
37.5	92		Depth (m) 0.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
28	90		Date Received 09/01/2020 Date Testing started 10/01/2020
20	88		Description: Brown slightly sandy, slightly gravelly, CLAY
14	85	CD AV (EL	
10	80	GRAVEL	Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by IS017892-4:2016. Results apply to sample as received.
6.3	75		5
5	72		0.063 0.425 0.6 0.3 0.425 0.6 0.3 1.18 1.18 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
3.35	69		
2	66		90
1.18	64		80
0.6	61		§ 70 1 1 1 1 1 1 1 1 1
0.425	60	SAND	§ 60 1
0.3	57		8 50 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
0.15	52		96 40 40 40 40 40 40 40 40 40 40 40 40 40
0.063	45		5
0.037	37		
0.027	33		
0.017	28	SILT/CLAY	
0.010	24	JIL I / CLAI	
0.007	20		0.0001 0.001 0.01 0.1 1 10 100
0.005	16		CLAY SILT Sieve size (mm) SAND GRAVEL
0.002	10		
		1001 1	Approved by: Date: Page no:

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5

					,
(note:	Sedimentation	stage	not	accredited)



particle	%		Contract No:	22150	Report No.	R108717	\ <u>\</u>	1801/2023	
size	passing		Contract:	Liffey Park T	echnology Par	·k		0	
75	100	COBBLES	BH/TP:	TPSA03				3	
63	100	COBBLES	Sample No.	AA118603	Lab. Sample	No.	A19/5979	\O 23	
50	93		Sample Type:	В				0	
37.5	88		Depth (m)	1.70	Customer:	Arup, 50 Ringse	nd Rd, Grand Canal Do	ock, Dublin 4	
28	86		Date Received	09/01/2020	Date Testing	g started	10/01/2020		
20	81		Description:	Brown slightl	y sandy, grave	elly, CLAY			
14	79	GRAVEL							
10	75	GRAVEL	Remarks	Note: Clause 9.2 and Clause 9.5	of B\$1377:Part 2:1990 have been	superseded by ISO17892-4:2016 . Results a	pply to sample as received.		
6.3	71					53	25.2 18 35	~	r¿.
5	69		100			0.063	0.425 0.6 0.6 1.18 2 3.35	5 6.3 10 14 20	28 37. 530.
3.35	66		100						
2	62		90						
1.18	59		80						
0.6	56		Dercentage passing (%) 00 00 00 00 00 00 00 00 00						
0.425	54	SAND	iligi 60						
0.3	52		50						
0.15	48		40						
0.063	42		Ceni						
0.037	35								
0.027	32		20		1111				
0.017	29	SILT/CLAY	10						
0.010	25	SIL1/CLAT	0						
0.007	22		0.0001 0.0	01	0.01	0.1	1	10	100
0.005	19			CLAY	SILT	Sieve size (mm)	SAND	GRA VEL	
0.002	14								

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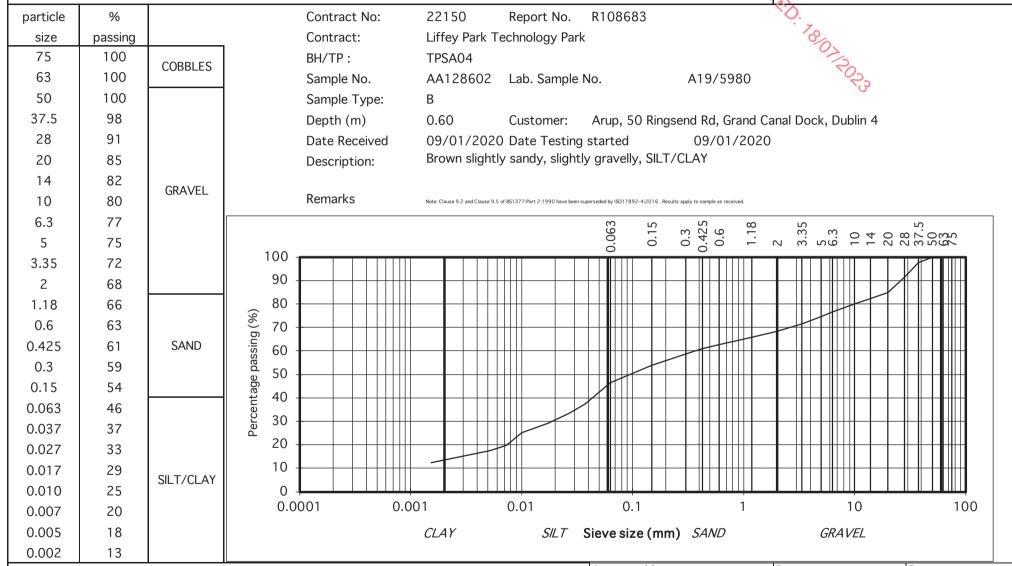
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 Date:
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 1 of 1

Determination

Tested in accordance w (note: Sed

n of Particle Size Distribution	PA	IVN
with: BS1377:Part2:1990, clause 9.2 & 9.5	C	, ,
dimentation stage not accredited)		VETAILED IN SCOPE H



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Approved by: Page no: Date: Eyene 24/01/20 1 of 1

Determination of Partic

Tested in accordance with: BS1377: (note: Sedimentation sta

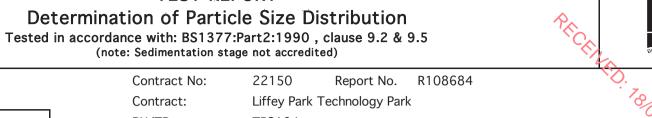
cle Size Distribution	PA	I NAB
':Part2:1990 , clause 9.2 & 9.5	·C_	TESTING
age not accredited)		DETAILED IN SCOPE REG NO. 133



		I						^	
particle	%		Contract No:	22150	Report No.	R108718		D. 78/02/2023	
size	passing		Contract:	Liffey Park T	echnology Par	k		8	
75	100	COBBLES	BH/TP:	TPSA04					
63	100	CODDEES	Sample No.	AA128604	Lab. Sample	No.	A19/5981	,05	
50	95		Sample Type:	В				0	
37.5	95		Depth (m)	2.20	Customer:	Arup, 50 Ringse	nd Rd, Grand Car	nal Dock, Dublin 4	
28	92		Date Received	09/01/2020	Date Testing	g started	10/01/2020		
20	88		Description:	Brown slightl	y sandy, grave	elly, CLAY			
14	82	GRAVEL							
10	77	GRAVEL	Remarks	Note: Clause 9.2 and Clause 9.5	of BS1377:Part 2:1990 have been	superseded by ISO17892-4:2016 . Results ap	ply to sample as received.		
6.3	72					2 2	8 27.75	Ω.	ι
5	69					0.063	0.425 0.6 0.6	3.35 5.3 6.3 10 14 20 28	37. 530. 533.
3.35	65		100						
2	61		90						
1.18	58		80						
0.6	54		<u>%</u> 70						
0.425	52	SAND	is 60						
0.3	49		sed 50						
0.15	45		age 40						
0.063	39		Dercentage passing (%) 80						
0.037	33		<u>5</u> 30						
0.027	29		20						
0.017	25		10						
0.010	21	SILT/CLAY	0						
0.007	18		0.0001 0.0	001	0.01	0.1	1	10	100
0.005	15			CLAY	SILT	Sieve size (mm)	SAND	<i>GRAVEL</i>	
0.002	9					. ,			
			15			Annroyed by:	Ir	Date:	Sade no.

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Approved by: Date: Page no: 24/01/20 1 of 1



particle	%		Contract N	o: 22150	Report No.	R108684		D. 78/07/2023	
size	passing		Contract:	Liffey Park	Technology Pa	rk		0	
75	100	COBBLES	BH/TP:	TPSA04					
63	100	CODDEES	Sample No.	AA12860	5 Lab. Sample	e No.	A19/5982	,0 ²	
50	93		Sample Typ	oe: B				0	
37.5	93		Depth (m)	2.60	Customer:	Arup, 50 Rings	end Rd, Grand Can	al Dock, Dublin 4	
28	87		Date Receiv	ved 09/01/20	20 Date Testin	g started	09/01/2020		
20	75		Description	: Dark brow	n slightly sandy	, gravelly, CLAY			
14	73	GRAVEL							
10	69	GRAVEL	Remarks	Note: Clause 9.2 and Claus	e 9.5 of BS1377:Part 2:1990 have bee	en superseded by ISO17892-4:2016 . Result	es apply to sample as received.		
6.3	66					53	8 8	5.5	
5	64		100			0.063	0.3 0.425 0.6 1.18	3.35 5. 6.3 10 14 20 28 37.5 50	75
3.35	62		100						
2	61		90						
1.18	59		80				- 		
0.6	57		70				 		
0.425	56	SAND	Dercentage passing (%) 60 60 40 30				 		
0.3	55		50						
0.15	53		tage 40						
0.063	47		cent						
0.037	42		g 30 -						
0.027	38		20						
0.017	33	SILT/CLAY	10	 1 			 		
0.010	28	SIL I / CLAT	0						
0.007	23		0.0001	0.001	0.01	0.1	1	10	100
0.005	19			CLAY	SILT	Sieve size (mm) SAND	GRAVEL	
0.002	12								

IGSL Ltd Materials Laboratory

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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

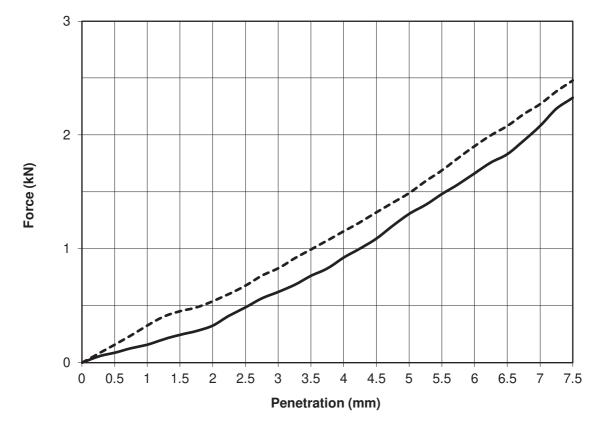
Report No. R108856 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP03 Sample No. AA108756 Type: B

Depth (m) 1.50 Lab sample No. A19/5956



Key: ----- Base

Description: Dark grey sandy gravelly CLAY

Initial Condition: Unsoaked Point 4

Moisture Content (%): 11 Bulk Density (Mg/m³): 2.22

Surcharge (kg): 4 Dry Density (Mg/m³): 2.00

% Material >20mm: 41

Method of compaction: Static Compaction Method 2

Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	6.6	7.5
Moisture	11	11
Content %		

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

Approved by	Date	Page No.
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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

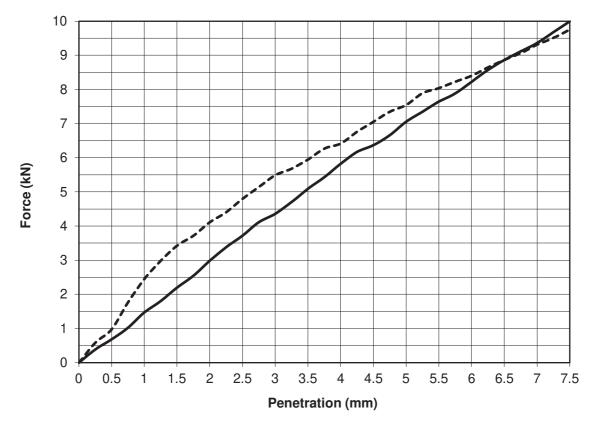
Report No.	R108857	Contract	Liffey Vally	Technology Fark, Leixlip,
			Co.Kildare	8

Contract No. 22150 Customer Co.Kildare Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP03 Sample No. AA108756 Type:

Depth (m) 1.50 Lab sample No. A19/5956



Key: ----- Base

Description: Dark grey sandy gravelly CLAY				
Initial Condition:	Unsoake	d Point 3		
Moisture Content (%):	9	Bulk Density (Mg/m ³):	2.19	
Surcharge (kg):	4	Dry Density (Mg/m ³):	2.01	
% Material >20mm:	41			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	35	38
Moisture	9	9
Content %		J

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

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Date Page No.
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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No.	R108858	Contract	Liffey Vally Techn	ology Park , Leixlip ,
			Co.Kildare	8

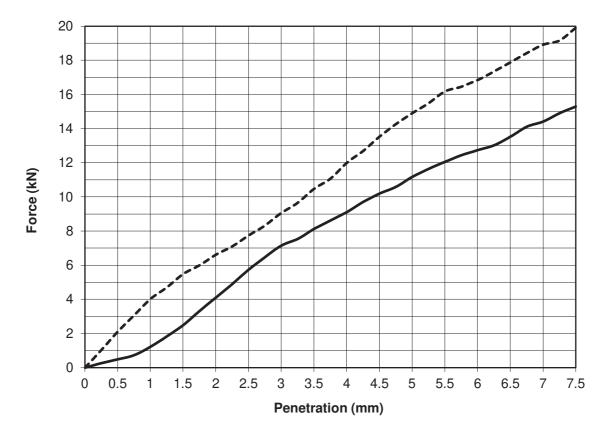
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP03 Sample No. AA108756 Type: E

Depth (m) 1.50 Lab sample No. A19/5956



Key: ——— Top ------ Base

Dark grey sandy gravelly CLAY Description: Initial Condition: **Unsoaked Point 2** Bulk Density (Mg/m³): Moisture Content (%): 7 2.14 4 Dry Density (Mg/m³): 2.00 Surcharge (kg): % Material >20mm: 41 Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	56	75
Moisture	7	7
Content %	'	,

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

Approved by	Date	Page No.
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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

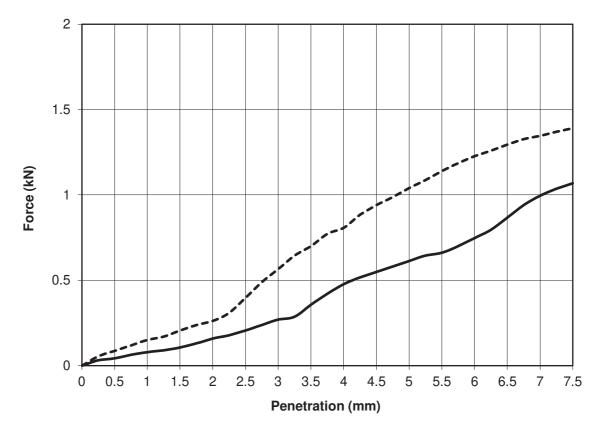
Report No. R108859 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 16/01/20

BH/TP No. TP03 Sample No. AA108756 Type: B

Depth (m) 1.50 Lab sample No. A19/5956



Key: ——Top ------ Base

Dark grey sandy gravelly CLAY Description: Initial Condition: Unsoaked Natural Point 1 Bulk Density (Mg/m³): Moisture Content (%): 13 2.22 4 Dry Density (Mg/m³): Surcharge (kg): 1.97 % Material >20mm: 41 Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	3.1	5.2
Moisture	13	13
Content %	10	10

Results apply to sample as received.

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

Approved by Date Page No.

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No.	R108860	Contract	Liffey Vally	Technology Park , Leixlip ,
			Co.Kildare	8

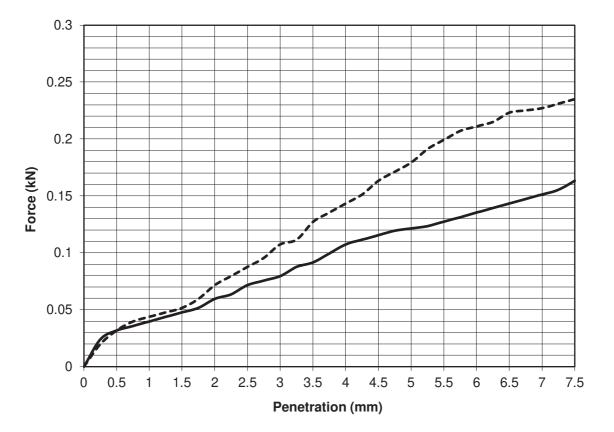
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP03 Sample No. AA108756 Type: E

Depth (m) 1.50 Lab sample No. A19/5956



Key: ——Top ------ Base

Description: Dark grey sandy gravelly CLAY

Initial Condition: Unsoaked Point 5

Moisture Content (%): 15 Bulk Density (Mg/m³): 2.24

Surcharge (kg): 4 Dry Density (Mg/m³): 1.95

% Material >20mm: 41

Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	0.6	0.9
Moisture	15	15
Content %		

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No.	R108862	Contract	Liffey Vally Tech	nology Fark , Leixlip ,
			Co.Kildare	8

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

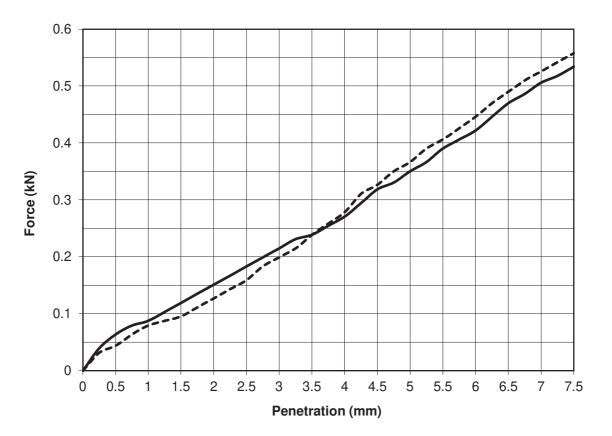
Dublin 4

Date received 09/01/20

Date Tested 16/01/20

BH/TP No. TP06 Sample No. AA108760 Type:

Depth (m) 0.80 Lab sample No. A19/5962



Key: ----- Base

Description: Brown slig	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Natural Point 1		
Moisture Content (%):	14	Bulk Density (Mg/m ³):	2.21	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.94	
% Material >20mm:	12			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	1.8	1.8
Moisture	14	14
Content %		

Results apply to sample as received.

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

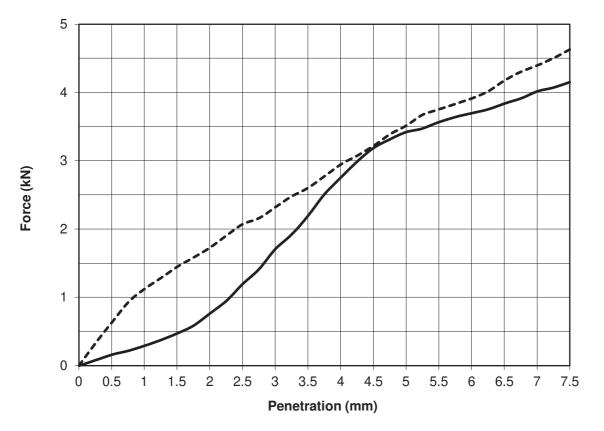
Report No. R108863 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP06 Sample No. AA108760 Type:

Depth (m) 0.80 Lab sample No. A19/5962



Key: ----- Base

Description: Brown sli	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 3		
Moisture Content (%):	9	Bulk Density (Mg/m ³):	2.15	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.96	
% Material >20mm:	12			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	17	18
Moisture	9	9
Content %		J

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108864 Contract Liffey Vally Technology Park, Leixlip,

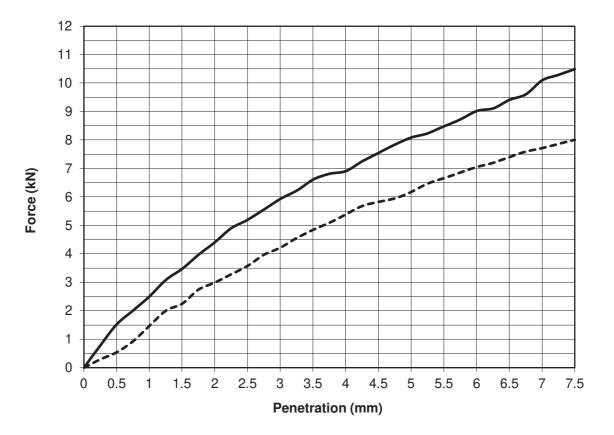
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP06 Sample No. AA108760 Type: B

Depth (m) 0.80 Lab sample No. A19/5962



Key: — Top ----- Base

Description: Brown slightly sandy, slightly gravelly, CLAY Initial Condition: Unsoaked Point 4 Bulk Density (Mg/m³): Moisture Content (%): 8 2.10 4 Dry Density (Mg/m³): Surcharge (kg): 1.94 % Material >20mm: 11.6 Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	41	31
Moisture	8	8
Content %		

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J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

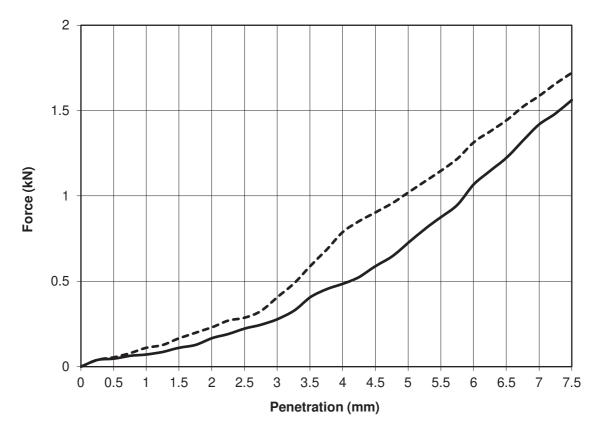
Report No. R108865 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP06 Sample No. AA108760 Type: B

Depth (m) 0.80 Lab sample No. A19/5962



Key: ----- Base

Description: Brown sli	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 5		
Moisture Content (%):	11	Bulk Density (Mg/m ³):	2.23	
Surcharge (kg):	4	Dry Density (Mg/m ³):	2.01	
% Material >20mm:	12			
Method of compaction:	Static Co	mnaction Method 2		

Test Result	Тор	Base
CBR %	3.6	5.1
Moisture	11	11
Content %	''	

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TEST REPORT Determination of California Bearing Ratio (CBR)



Dublin 4

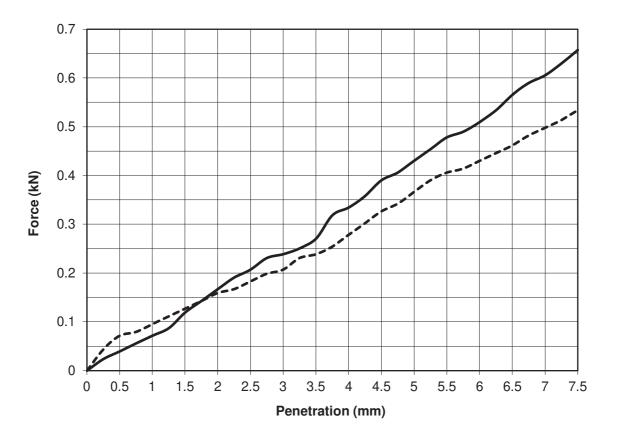
Tested in accordance with BS1377:Part 4:1990, clause

Report No.	R108866	Contract	Liffey Vally Technology Park, Leixlip,
			Co.Kildare
Contract No.	22150	Customer	Arup, 50 Ringsend Rd, Grand Canal Dock,

Date received 09/01/20 Date Tested 20/01/20

BH/TP No. TP06 Sample No. AA108760 Type:

Depth (m) 0.80 Lab sample No. A19/5962



Key:	——Тор	 Base

Description: Brown slightly sandy, slightly gravelly, CLAY				
Initial Condition:	Unsoake	d Point 2		
Moisture Content (%):	12	Bulk Density (Mg/m ³):	2.21	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.97	
% Material >20mm:	12			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	2.2	1.8
Moisture	12	12
Content %	'-	12

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

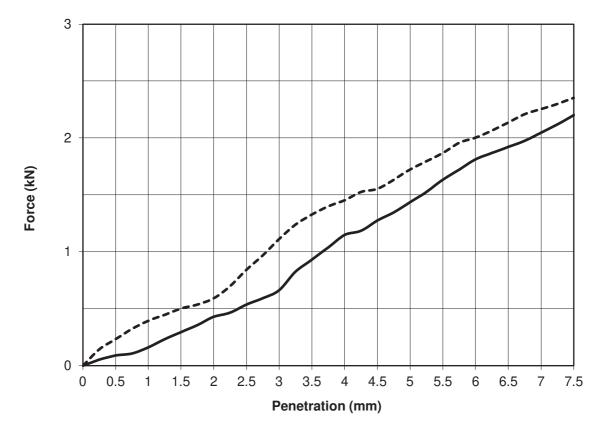
Report No. R108738 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 16/01/20

BH/TP No. TP10 Sample No. AA118606 Type:

Depth (m) 0.80 Lab sample No. A19/5970



Key: ----- Base

Description: Brown slightly sandy, slightly gravelly, CLAY				
Initial Condition:	Unsoake	d Natural Point 1		
Moisture Content (%):	17	Bulk Density (Mg/m ³):	2.09	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.78	
% Material >20mm:	11			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	7	9
Moisture	17	17
Content %	''	''

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108738 Contract Liffey Vally Technology Park, Leixlip,

Co.Kildare

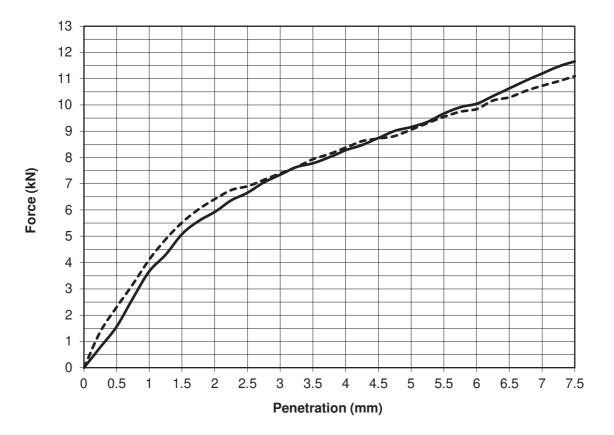
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 16/01/20

BH/TP No. TP10 Sample No. AA118606 Type: B

Depth (m) 0.80 Lab sample No. A19/5970



Key: ——— Top ------ Base

Description: Brown slip	ghtly sandy	v, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 5		
Moisture Content (%):	8	Bulk Density (Mg/m ³):	1.88	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.74	
% Material >20mm:	11			
Method of compaction:	Static Co	mpaction Method 2		

R108739.TP10@0.80m.CBR2

Test Result	Тор	Base
CBR %	50	52
Moisture	8	8
Content %		U

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

Approved by Date Page No.

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108740 Contract Liffey Vally Technology Park , Leixlip ,

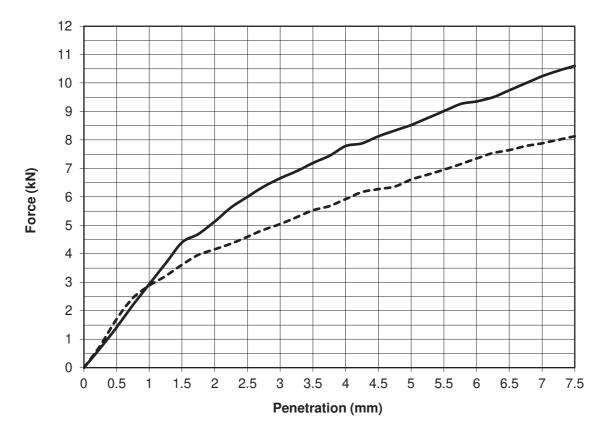
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 17/01/20

BH/TP No. TP10 Sample No. AA118606 Type: B

Depth (m) 0.80 Lab sample No. A19/5970



Key: ——— Top ------ Base

Description: Brown sli	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 4		
Moisture Content (%):	10	Bulk Density (Mg/m ³):	1.96	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.78	
% Material >20mm:	11			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	45	35
Moisture	10	10
Content %	10	10

Persons authorized to approve reports

J Barrett (Quality Manager)

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IGSL Ltd Materials Laboratory

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108741 Contract Liffey Vally Technology Park , Leixlip ,

Co.Kildare
Contract No. 22150 Customer Arup, 50

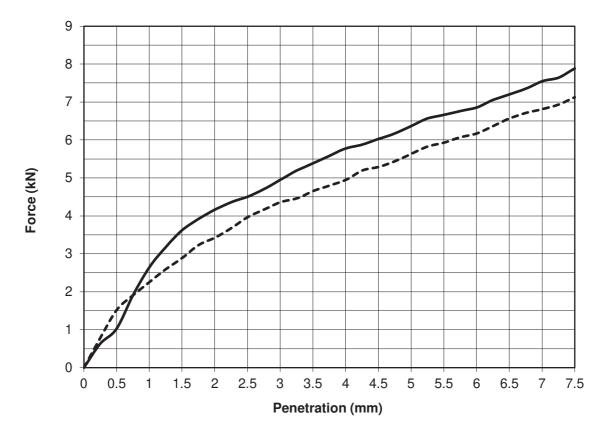
Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 17/01/20

BH/TP No. TP10 Sample No. AA118606 Type: B

Depth (m) 0.80 Lab sample No. A19/5970



Key: ——— Top ------ Base

Description: Brown sli	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 3		
Moisture Content (%):	12	Bulk Density (Mg/m ³):	2.04	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.82	
% Material >20mm:	11			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	34	30
Moisture	12	12
Content %	'-	

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

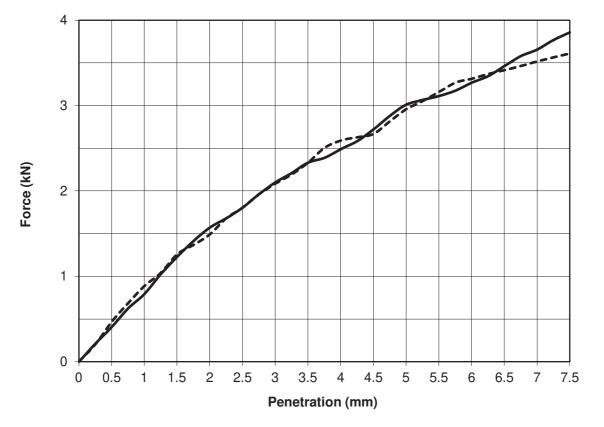
Report No. R108742 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 17/01/20

BH/TP No. TP10 Sample No. AA118606 Type: B

Depth (m) 0.80 Lab sample No. A19/5970



Key: ----- Base

Description: Brown sli	ghtly sandy	, slightly gravelly, CLAY		
Initial Condition:	Unsoake	d Point 2		
Moisture Content (%):	14	Bulk Density (Mg/m ³):	2.07	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.81	
% Material >20mm:	11			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	15	15
Moisture	14	14
Content %		

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

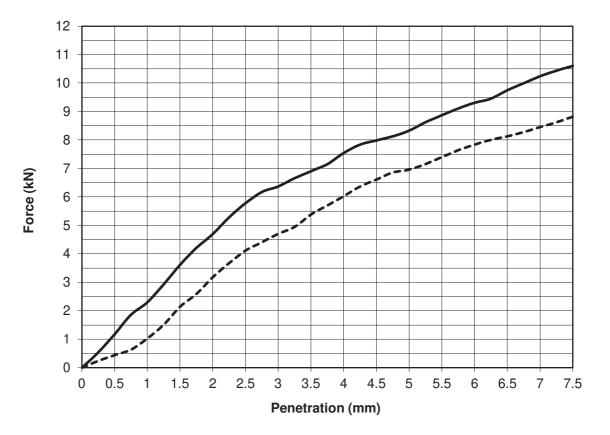
Report No. R108930 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 22/01/20

BH/TP No. TP11 Sample No. AA118616 Type: B

Depth (m) 1.50 Lab sample No. A19/5972



Key: ----- Base

Description: Brown ve	ry sandy, s	slightly gravelly, SILT/CLAY		
Initial Condition:	Unsoake	d Point 5		
Moisture Content (%):	5	Bulk Density (Mg/m ³):	1.84	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.75	
% Material >20mm:	0			
Method of compaction:	Static Co	ompaction Method 2		

Test Result	Тор	Base
CBR %	44	35
Moisture	5	5
Content %		Ŭ

Persons authorized to approve reports

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108931 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

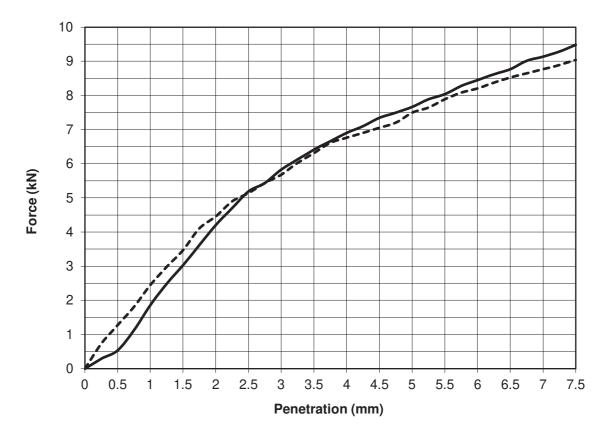
Dublin 4

Date received 09/01/20

Date Tested 22/01/20

BH/TP No. TP11 Sample No. AA118616 Type:

Depth (m) 1.50 Lab sample No. A19/5972



Key: — Top ----- Base

Description: Brown ve	ry sandy, s	slightly gravelly, SILT/CLAY		
Initial Condition:	Unsoake	d Point 4		
Moisture Content (%):	7	Bulk Density (Mg/m ³):	1.92	
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.79	
% Material >20mm:	0			
Method of compaction:	Static Co	mpaction Method 2		

Test Result	Тор	Base
CBR %	39	39
Moisture	7	7
Content %	l '	,

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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Date Page No.
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045 899324

TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

Report No. R108932 Contract Liffey Vally Technology Park , Leixlip ,

Co.Kildare
Contract No. 22150 Customer Arup, 50

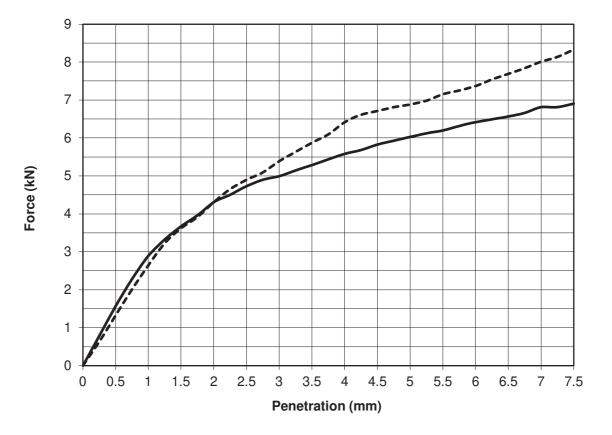
Arup, 50 Ringsend Rd, Grand Canal Dock,

Dublin 4

Date received 09/01/20 Date Tested 22/01/20

BH/TP No. TP11 Sample No. AA118616 Type:

Depth (m) 1.50 Lab sample No. A19/5972



Key: ——Top ------ Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY

Initial Condition: Unsoaked Point 3

Moisture Content (%): 9 Bulk Density (Mg/m³): 1.97

Surcharge (kg): 4 Dry Density (Mg/m³): 1.80

% Material >20mm: 0

Method of compaction: Static Compaction Method 2

Test Result	Тор	Base
CBR %	36	37
Moisture	q	9
Content %		J

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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TEST REPORT Determination of California Bearing Ratio (CBR)



Dublin 4

Tested in accordance with BS1377:Part 4:1990, clause

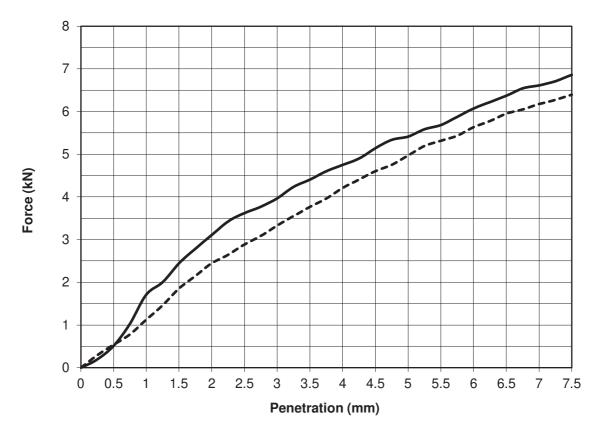
Report No. R108933 Contract Liffey Vally Technology Park , Leixlip ,

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,

Date received 09/01/20 Date Tested 22/01/20

BH/TP No. TP11 Sample No. AA118616 Type:

Depth (m) 1.50 Lab sample No. A19/5972



Key: ----- Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY						
Initial Condition:	Unsoake	d Point 2				
Moisture Content (%):	11	Bulk Density (Mg/m ³):	2.05			
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.85			
% Material >20mm:	0					
Method of compaction:	Static Co	mpaction Method 2				

Test Result	Тор	Base
CBR %	27	25
Moisture	11	11
Content %	''	

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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TEST REPORT Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause

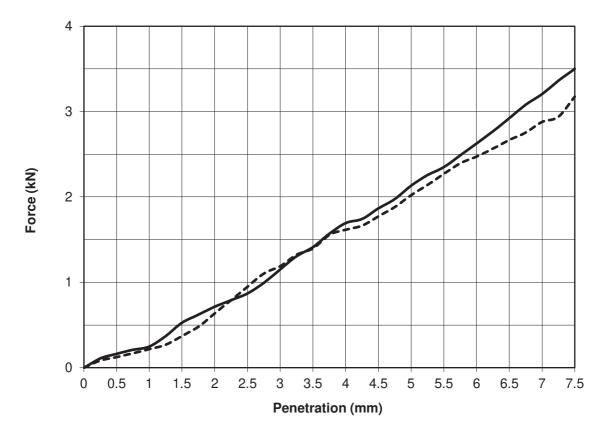
Report No. R108934 Contract Liffey Vally Technology Park , Leixlip , Co.Kildare

Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock,
Dublin 4

Date received 09/01/20 Date Tested 22/01/20

BH/TP No. TP11 Sample No. AA118616 Type:

Depth (m) 1.50 Lab sample No. A19/5972



Key: ----- Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY							
Initial Condition:	Unsoake	d Point 1					
Moisture Content (%):	13	Bulk Density (Mg/m ³):	2.10				
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.86				
% Material >20mm:	0						
Method of compaction:	Static Co	mpaction Method 2					

Test Result	Тор	Base
CBR %	11	10
Moisture	13	13
Content %	'0	10

Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

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TEST REPORT Determination of MCV / moisture content Relation of a soil

Tested in accordance with BS1377-4:1990, clause 5.50

Report No. R108719 Contract Liffey Park Technology Park , Leixlip , Co.Kildare

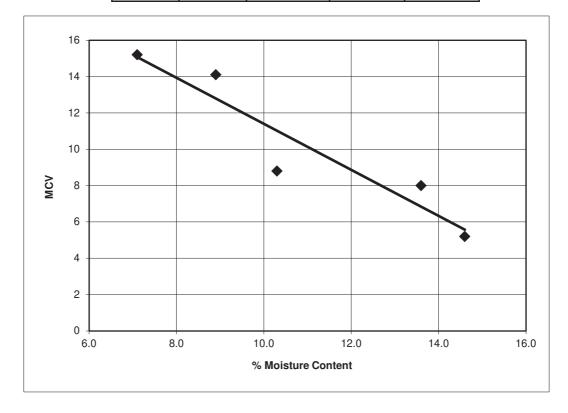
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date received 09/01/20 Date Tested 15/01/20

BH/TP No. TP03 Sample No. AA108756 Type: B

Depth (m) 1.50 Lab sample No. A19/5956

MC% 7.1 8.9 10 14 15 MCV 15.2 14.1 8.8 8 5.2



% material >20mm 46

Persons authorized to approve reports

J Barrett (Quality Manager) H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

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Date

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Page No.

TEST REPORT Determination of MCV / moisture content Relation of a soil

Tested in accordance with BS1377-4:1990, clause 5.50

Report No. R108736 Contract Liffey Park Technology Park, Leixlip,

Co.Kildare

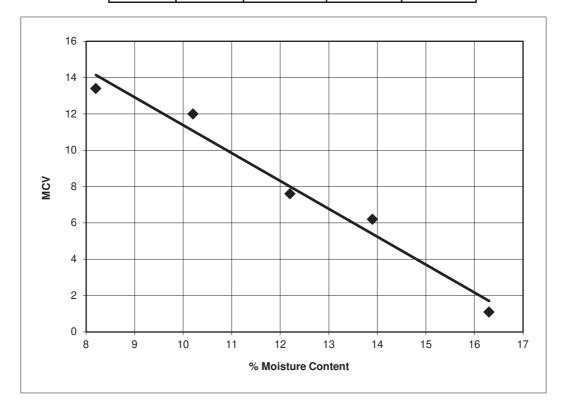
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date received 09/01/20 Date Tested 15/01/20

BH/TP No. TP06 Sample No. AA108760 Type: B

Depth (m) 0.80 Lab sample No. A19/5962

MC% 16 14 12 10 8.2 MCV 1.1 6.2 7.6 12 13.4



% material >20mm 13

Persons authorized to approve reports

J Barrett (Quality Manager) H Byrne (Laboratory Manager)

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TEST REPORT Determination of MCV / moisture content Relation of a soil

Tested in accordance with BS1377-4:1990, clause 5.5

Report No. R108720 Contract Liffey Park Technology Park , Leixlip ,

Co.Kildare

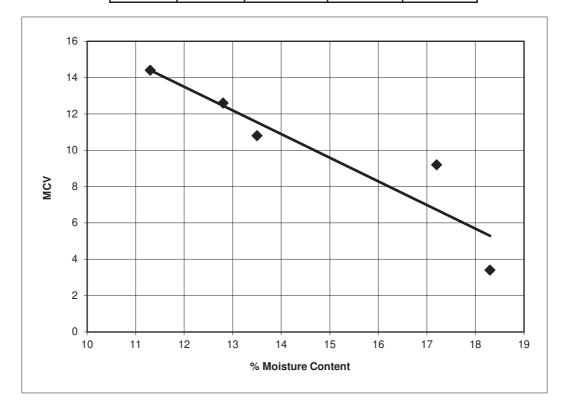
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date received 09/01/20 Date Tested 15/01/20

BH/TP No. TP10 Sample No. AA118606 Type: B

Depth (m) 0.80 Lab sample No. A19/5970

MC% 18 17 14 13 11 MCV 3.4 9.2 10.8 12.6 14.4



% material >20mm 13

Persons authorized to approve reports

J Barrett (Quality Manager) H Byrne (Laboratory Manager)

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TEST REPORT Determination of MCV / moisture content Relation of a soil

Tested in accordance with BS1377-4:1990, clause 5.50

Report No. R109019 Contract Liffey Park Technology Park, Leixlip,

Co.Kildare

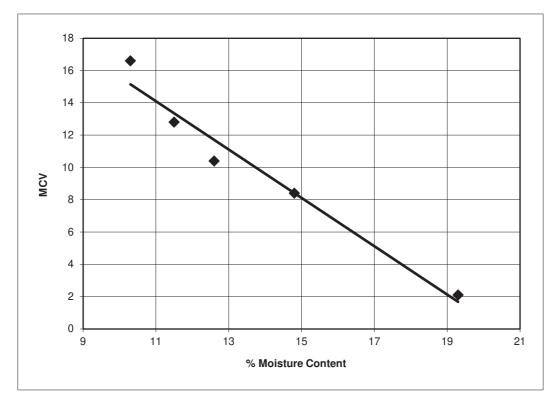
Contract No. 22150 Customer Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date received 09/01/20 Date Tested 17/01/20

BH/TP No. TP11 Sample No. AA118616 Type: B

Depth (m) 1.50 Lab sample No. A19/5972

MC% 19 15 12.6 11.5 10 MCV 2.1 8.4 10.4 12.8 16.6



% material >20mm 0

Persons authorized to approve reports

J Barrett (Quality Manager) H Byrne (Laboratory Manager)

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Test Report

Dry Density/Moisture Content Relationship



Tested in accordance with BS1377:Part 4:1990

Report No. R108855 Contract No. 22150

Contract Name: Liffey Park Technology Park , Leixlip, Co. Kildare

Lab Contract No. Location: **TP03**

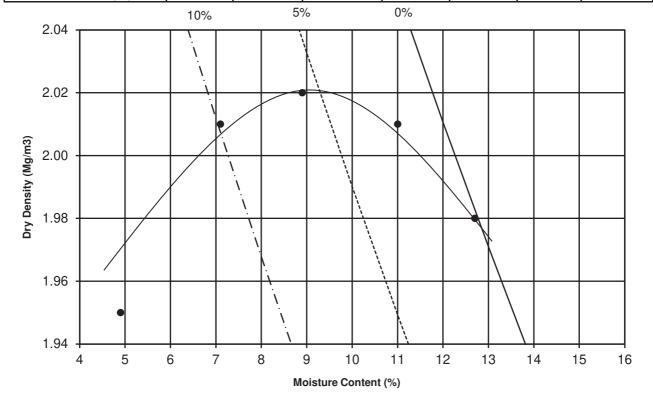
Sample No. AA108756 Depth (m) 1.5 Material Type

Lab sample no. A19/5956 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date Received: 2.5 KG Rammer 09/01/2020 Test Method:

Date Tested: 16/01/2020 BS1377:Part 4:1990 3.3

Dry Density (Mg/m ³)	1.98	1.95	2.01	2.02	2.01	0.00	
Moisture Content (%)	13	4.9	11	8.9	7.1	0	



Maximum Dry Density (Mg/m³): 2.02 Optimum Moisture Content (%):

Description: Dark grey sandy gravelly CLAY

Sample Preparation: Material passing 20mm Single / Separate samples used

Particle Density (Mg/m³): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 41

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Persons authorised to approve reports J Barrett (Quality Manager) The result relates to the specimen tested. H Byrne (Laboratory Manager)

Opinions and interpretations are outside the scope of accreditation

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Test Report

Dry Density/Moisture Content Relationship



Tested in accordance with BS1377:Part 4:1990

Report No. R108861 Contract No. 22150

Contract Name: Liffey Park Technology Park , Leixlip, Co. Kildare

Lab Contract No. 22150 Location: TP06

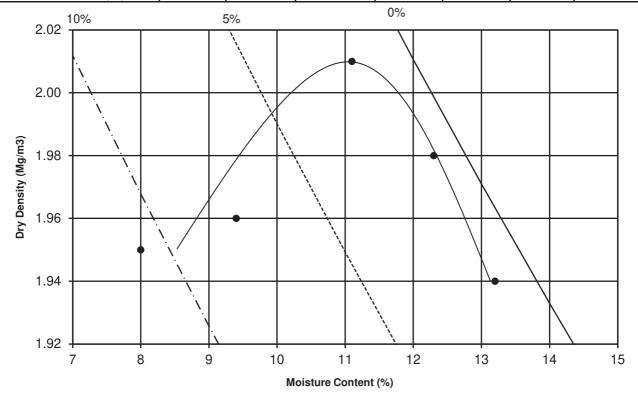
Sample No. AA108760 Depth (m) 0.8 Material Type E

Lab sample no. A19/5962 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date Received: 09/01/2020 Test Method: 2.5 KG Rammer

Date Tested: 16/01/2020 BS1377:Part 4:1990 3.3

Dry Density (Mg/m ³)	1.94	1.98	2.01	1.96	1.95	0.00	
Moisture Content (%)	13	12	11	9.4	8.0	0	



Maximum Dry Density (Mg/m³): 2.01 Optimum Moisture Content (%): 11

Description: Brown slightly sandy, slightly gravelly, CLAY

Sample Preparation: Material passing 20mm Single / Separate samples used

Particle Density (Mg/m³): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 12

Persons authorised to approve reports

J Barrett (Quality Manager)

The result relates to the specimen tested.

Opinions and interpretations are outside the scope of accreditation

H Byrne (Laboratory Manager)

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Date Page
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Test Report

Dry Density/Moisture Content Relationship



Tested in accordance with BS1377:Part 4:1990

Report No. R109128 Contract No. 22150

Contract Name: Liffey Park Technology Park , Leixlip, Co. Kildare

Lab Contract No. 22150 Location: TP06

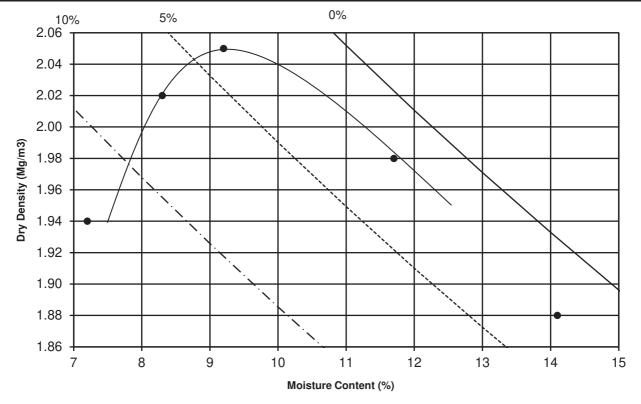
Sample No. AA108760 Depth (m) 8.0 Material Type

Lab sample no. A19/5962 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date Received: 09/01/2020 Test Method: 4.5 KG Rammer

Date Tested: 16/01/2020 BS1377:Part 4:1990 3.5

Dry Density (Mg/m ³)	1.88	1.98	2.05	2.02	1.94	0.00	
Moisture Content (%)	14	12	9.2	8.3	7.2	0	



Maximum Dry Density (Mg/m³): 2.05 Optimum Moisture Content (%):

Description: Brown slightly sandy, slightly gravelly, CLAY

Sample Preparation: Material passing 20mm Single / Separate samples used

Particle Density (Mg/m³): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 12

Persons authorised to approve reports J Barrett (Quality Manager) The result relates to the specimen tested. H Byrne (Laboratory Manager)

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Opinions and interpretations are outside the scope of accreditation

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Test Report

Dry Density/Moisture Content Relationship



Tested in accordance with BS1377:Part 4:1990

Report No. R108737 Contract No. 22150

Contract Name: Liffey Park Technology Park , Leixlip, Co. Kildare

Lab Contract No. 22150 Location: TP10

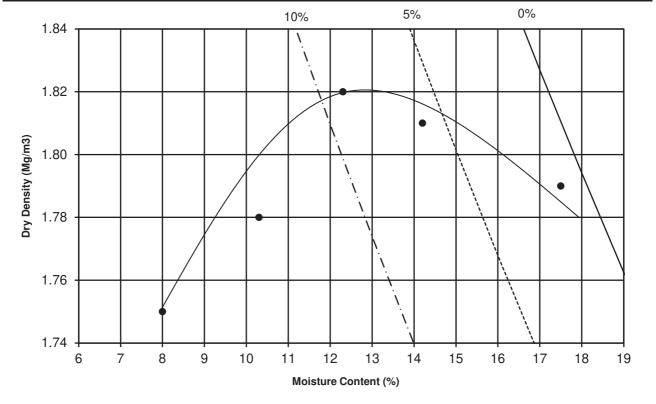
Sample No. AA11806 Depth (m) 0.8 Material Type E

Lab sample no. A19/5970 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date Received: 09/01/2020 Test Method: 2.5 KG Rammer

Date Tested: 16/01/2020 BS1377:Part 4:1990 3.3

Dry Density (Mg/m ³)	1.79	1.81	1.82	1.78	1.75	0.00	
Moisture Content (%)	18	14	12	10	8.0	0	



Maximum Dry Density (Mg/m³): 1.82 Optimum Moisture Content (%): 12

Description: Brown slightly sandy, slightly gravelly, CLAY

Sample Preparation: Material passing 20mm Single / Separate samples used

Particle Density (Mg/m³): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve:

J Barrett (Quality Manager)

The result relates to the specimen tested.

Opinions and interpretations are outside the scope of accreditation

H Byrne (Laboratory Manager)

IGSL Materials Laboratory

Approved by
Date Page
24/01/20 1 of 1

Persons authorised to approve reports

Test Report

Dry Density/Moisture Content Relationship



Tested in accordance with BS1377:Part 4:1990

Report No. R108929 Contract No. 22150

Contract Name: Liffey Park Technology Park , Leixlip, Co. Kildare

Lab Contract No. Location: **TP11**

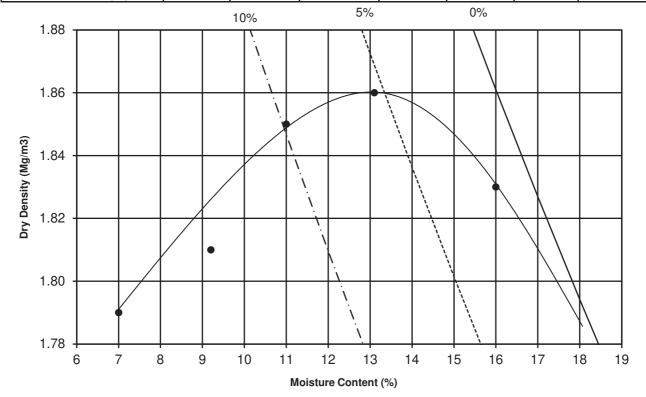
Sample No. AA118616 Depth (m) 1.5 Material Type

Lab sample no. A19/5972 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Date Received: 2.5 KG Rammer 09/01/2020 Test Method:

Date Tested: 22/01/2020 BS1377:Part 4:1990 3.3

Dry Density (Mg/m ³)	1.76	1.79	1.81	1.85	1.86	1.83	
Moisture Content (%)	5.0	7.0	9.2	11	13	16	



Maximum Dry Density (Mg/m³): 1.86 Optimum Moisture Content (%): 13

Description: Brown very sandy, slightly gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm Single / Separate samples used

Particle Density (Mg/m³): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve:

The result relates to the specimen tested.

H Byrne (Laboratory Manager) Opinions and interpretations are outside the scope of accreditation

Approved by Date **IGSL Materials Laboratory** A Byene 24/01/20 1 of 1

J Barrett (Quality Manager)

Persons authorised to approve reports

IGSL Ltd

Materials Laboratory Unit F, M7 Business Park

Naas Co. Kildare

045-899324

Test Report

Undrained shear strength in triaxial compression (without pore pressure measurement)

Tested in accordance with BS1377:Part 7:1990 clause 8 (definitive method)*



Report no:

R107327

Contract Name:

Liffey Park Tech Campus

Contract No:

22150

Location:

RC01 2.6m

Sample No.

Description: Dark grey slightly sandy slightly gravelly CLAY (gravel is mudstone)

Customer:

ARUP

Height (mm)

200

Diameter

102

Cell pressure(kPa)

50

Moisture Content %

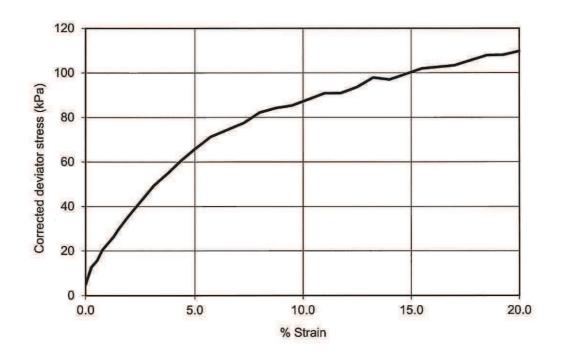
19

Bulk density (Mg/m³)

2.14

Dry density (Mg/m³)

1.81



Strain at failure %

20

Cohesion C_u (kPa)

55

(Undrained shear strength kPa)

Rate of strain (%/minute)

2.0

Thickness of membrane 0.2

Membrane correction (at failure)

0.75

Date received

Date tested

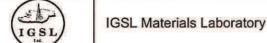
08/11/19

The result relates to the specimen in as received condition unless otherwise stated.

Any remaining material will be retained for one month.

*This Standard has been superceded by ISO17892-8:2018

Person authorised to approve report: J Barrett (Quality Manager)



Approved	by
	397LH

045-899324

Test Report

Undrained shear strength in triaxial compression (without pore pressure measurement)

Tested in accordance with BS1377:Part 7:1990 clause 8 (definitive method)



78/07/023

Report no:

R107327

Contract Name:

Liffey Park Tech Campus

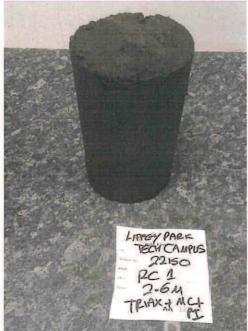
Contract No:

22150

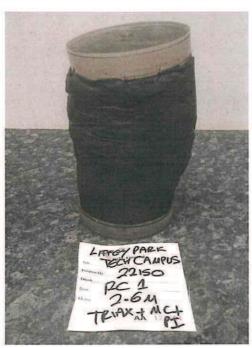
Location:

RC01 2.6m

Lab Sample No.



Before Test.



After Test

		Person authorised to approve	report: H Byrne	(Quality Manager)	
		Approved by	Date	Page	
IGSL	IGSL Materials Laboratory	392-4H	19/11/19	2 of 2	

IGSL Ltd

Materials Laboratory Unit F, M7 Business Park

Naas Co. Kildare

045-899324

Test Report

Undrained shear strength in triaxial compression (without pore pressure measurement)

Tested in accordance with BS1377:Part 7:1990 clause 8 (definitive method)*



Report no:

R107328

Contract Name:

Liffey Park Tech Campus

Contract No:

22150

Location:

RC04 2.5m

Sample No.

Description: Dark grey slightly sandy slightly gravelly CLAY

Customer:

ARUP

Height (mm)

200

Diameter

103

Cell pressure(kPa)

50

Moisture Content %

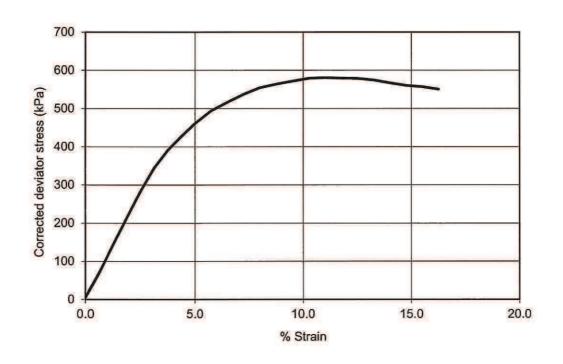
9.0

Bulk density (Mg/m³)

2.31

Dry density (Mg/m³)

2.12



Strain at failure %

11

Cohesion C_u (kPa)

290

(Undrained shear strength kPa)

Rate of strain (%/minute)

Thickness of membrane

2.0

0.2

Membrane correction (at failure)

0.48

Date received

Date tested

12/11/19

The result relates to the specimen in as received condition unless otherwise stated.

Any remaining material will be retained for one month.

*This Standard has been superceded by ISO17892-8:2018

Person authorised to approve report:	J Barrett (Quality Manager)

Approved by Date Page **IGSL Materials Laboratory** 19/11/19 1 of 2 thewar

045-899324

Test Report

Undrained shear strength in triaxial compression (without pore pressure measurement)

Tested in accordance with BS1377:Part 7:1990 clause 8 (definitive method)



Report no:

R107328

Contract Name:

Liffey Park Tech Campus

Contract No:

22150

Location:

RC04 2.5m

Lab Sample No.



Before Test.



After Test

		Person authorised to approve	e report: H Byrne	(Quality Manager
1		Approved by	Date	Page
IGSL	IGSL Materials Laboratory	THE TOPE	19/11/19	2 of 2



One dimensional Consolidation

BS1377:Part 5:1990

Report No. R107329

Contract:

Liffey Park Tech Campus

Contract number:

78 (2150)

BH:

RC04

Sample number:

Depth (m):

Description Dark grey slightly sandy slightly gravelly CLAY

Specimen Height (mm)

20.0

Specimen diameter (mm)

75.1

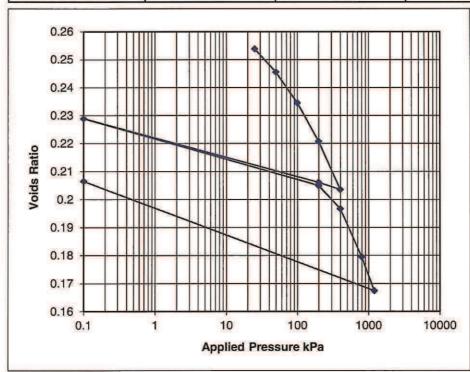
Moisture content % Bulk density Mg/m³ Dry density Mg/m³ Void ratio

Initial	Final
10	11
2.28	2.41
2.08	2.17
0.273	0.207

Assumed Particle density Mg/m³

2.65

Applied Pressure (kPa)	$m_v (m^2/MN)$	c _v (m²/year)	Voids Ratio	
0 - 25	0.612	3.194	0.25388	
25 - 50	0.264	9.698	0.24560	
50 - 100	0.178	8.700	0.23452	
100 - 200	0.111	9.358	0.22077	
200 - 400	0.070	9.124	0.20358	
400 - 200	0.011	4.727	0.20613	
200 - 0.1	0.095	6.495	0.22892	
0.1 - 200	0.097	4.506	0.20498	
200 - 400	0.034	4.387	0.19670	
400 - 800	0.036	4.295	0.17951	
800 - 1200	0.026	1.782	0.16742	
1200 - 0.1	0.028	1.823	0.20651	



PRICENED. 78/07/2023

Appendix 9

Rock Laboratory Testing

Report No. 22150 22 | P a g e

IGSL Ltd Materials Laboratory Unit J5, M7 Business Park Newhall, Naas Co. Kildare 045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits



Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

Report No. Liffey Park Tech Campus R107314 Contract No. 22150 Contract Name:

Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4

Samples Received: 01/11/19 Date Tested: 08/11/19

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425μm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
RC01	N/A	2.6	A19/5223	U	19	39	21	18	64	WS	4.4	СІ	Grey sandy gravelly CLAY
RC04	N/A	2.5	A19/5224	U	8.7	40	16	24	35	WS	4.4	СІ	Black sandy gravelly CLAY
RC04	N/A	2.8	A19/5225	U	8.2	29	14	15	60	WS	4.4	CL	Grey sandy gravelly CLAY
RC06	N/A	1.95	A19/5226	U	9.9	32	17	15	44	WS	4.4	CL	Grey sandy gravelly CLAY
											·	·	
												·	
Notes:	Preparation:	WS - Wet sieved	_		Sample Type:	B - Bulk Distu	ırbed	Remarks:					

Clause:

AR - As received

NP - Non plastic

Liquid Limit 4.3 Cone Penetrometer definitive method

4.4 Cone Penetrometer one point method

U - Undisturbed

Results apply to the sample as received.

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Laboratory Manager)

Approved by

Date 18/11/19

1 of 1

Page

(Diametrial) POINT LOAD STRENGTH INDEX TEST DATA

Contract: Liffey Park Technology Campus | Sample Type: Core

Contract no.	-	mology campus		-				·	Mest/
Date of test:									70
RC No.	Depth	D (Diameter)	P (failure load)	F	Is (index strength)	ls(50) (index	*UCS	_	4
	m	mm	kN		Мра	strength) Mpa	MPa	Туре	Orienation
RC01	3.9	102	19.0	1.378	1.83	2.52	50	d	//
	5.0	102	4.0	1.378	0.38	0.53	11	d	//
	5.9	102	6.0	1.378	0.58	0.79	16	d	//
	7.4	102	21.0	1.378	2.02	2.78	56	d	//
	8.8	102	22.0	1.378	2.11	2.91	58	d	//
RC04	4.2	102	28.0	1.378	2.69	3.71	74	d	//
	4.4	102	7.0	1.378	0.67	0.93	19	d	//
	5.9	102	18.0	1.378	1.73	2.38	48	d	//
	6.9	102	11.0	1.378	1.06	1.46	29	d	//
	8.6	102	22.0	1.378	2.11	2.91	58	d	//
	9.1	102	14.0	1.378	1.35	1.85	37	d	//
RC06	3.1	102	4.0	1.378	0.38	0.53	11	d	//
	5.3	102	19.0	1.378	1.83	2.52	50	d	//
	7.2	102	26.0	1.378	2.50	3.44	69	d	//
	9.0	102	29.0	1.378	2.79	3.84	77	d	//
RC12	3.4	102	6.0	1.378	0.58	0.79	16	d	//
	5.9	102	11.0	1.378	1.06	1.46	29	d	//
	7.4	102	26.0	1.378	2.50	3.44	69	d	//
	7.6	102	28.0	1.378	2.69	3.71	74	d	//
	9.9	102	12.0	1.378	1.15	1.59	32	d	//
Stati	istical Summ	ary Data	ls(50)	UCS*	*UCS Normal	Distribution Cur	/e	Ab	breviations
Number of Sa	amples Teste	ed	20	20				i	irregular
4inimum			0.53	11	0.35			а	axial
Average			2.21	44	0.3 + / \			b	block
Maximum			3.84	77	0.25				diametral
Standard Dev	/ .		1.14	23					
Jpper 95% C	oper 95% Confidence Limit 4.44 88.79				0.15			appro	x. orientation
			-0.57	0.13			to	planes of	
					1 1/ 1				ness/bedding
Comments:					0.05			U	unknown
*UCS taken a	s k x Point L	oad Is(50): k=	=	20	0	100 200	300	P //	perpendicular parallel

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC01 Depth (m): 3.50m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh Muddy LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements **Sketch of Failure Surfaces** Length 200 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 219 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 219000 8167.14

1000 x P ∏ x (Ø/2)^2

26.80

2.66

Bulk Density

Notes:

(Mpa)

(Mg/m³)

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name: Liffey Park Technology Campus

Job Number: 22150 Hole No: RC01 Depth (m): 4.30m PRICEINED: 78/07/2023

Sample Description

Colour: Dark grey Fine-grained Grain size:

Weathering Grade: Fresh

Muddy LIMESTONE Rock Type:

Weathering Grade Criteria

I. Fresh: Unchanged from original state

Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration

IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

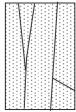
Sample Measurements

Sketch of Failure Surfaces

Length 204 Diameter (Ø) 102.1 mm

Testing

kN/min Load Rate 4.3 194 kΝ Load at Failure (P)



Strength Calculations

Uniaxial Compressive Strength = 194000 8183.16185

> 1000 x P $\prod x (\emptyset/2)^2$

23.70 (Mpa)

(Mg/m³)2.65 **Bulk Density**

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC01 Depth (m): 7.40m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh Muddy LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements **Sketch of Failure Surfaces** Length 155 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 kΝ Load at Failure (P) 511



Uniaxial Compressive Strength =	511000		
	8167.14		

= 1000 x P ∏ x (Ø/2)^2

= 62.54 (Mpa)

Bulk Density = 2.66 (Mg/m³)

Uniaxial Compression Test Report Sheet

PROPRIED. TOO PROPRIED.

Sample Identification

Contract Name: Liffey Park Technology Campus

 Job Number:
 22150

 Hole No:
 RC01

 Depth (m):
 8.00m

Sample Description

Colour: Dark grey
Grain size: Fine-grained

Weathering Grade: Fresh
Rock Type: LIMESTONE

Weathering Grade Criteria

I. Fresh: Unchanged from original state

II. Slightly weathered: Slight discolouration, slight weakening
III. Moderately weathered: Considerable weakening, penetrative discolouration

IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

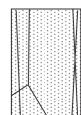
Sketch of Failure Surfaces

 Length
 199

 Diameter (Ø)
 102
 mm

Testing

Load Rate 4.3 kN/min
Load at Failure (P) 588 kN



Strength Calculations

Uniaxial Compressive Strength = 588000 8167.14

= 71.96 (Mpa)

Bulk Density = 2.65 (Mg/m³)

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC04 Depth (m): 5.50m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements Sketch of Failure Surfaces Length 204 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 448 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 448000 8167.14 1000 x P $\prod x (\emptyset/2)^2$ (Mpa) 54.83 (Mg/m³)2.66 **Bulk Density**

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC04 Depth (m): 6.20m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements Sketch of Failure Surfaces Length 202 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 501 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 501000 8167.14 1000 x P $\prod x (\emptyset/2)^2$ (Mpa) 61.31

(Mg/m³)

2.65

Bulk Density

Uniaxial Compression Test Report Sheet

I.G.S.L.

Sample Identification

Contract Name: Liffey Park Technology Campus

Job Number: 22150 Hole No: RC04 Depth (m): 9.40m

PRORING TOO TOO

Sample Description

Colour: Dark grey Fine-grained Grain size:

Weathering Grade: Fresh LIMESTONE Rock Type:

Weathering Grade Criteria

I. Fresh: Unchanged from original state

Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration

IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

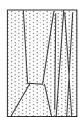
Sample Measurements

Sketch of Failure Surfaces

Length 142 Diameter (Ø) 102 mm

Testing

kN/min Load Rate 4.3 kΝ Load at Failure (P) 344



Strength Calculations

Uniaxial Compressive Strength = 344000 8167.14

> 1000 x P $\prod x (\emptyset/2)^2$

42.10 (Mpa)

(Mg/m³)2.66 **Bulk Density**

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC06 Depth (m): 4.90m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements **Sketch of Failure Surfaces** Length 225 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 277 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 277000 8167.14 1000 x P $\prod x (\emptyset/2)^2$ (Mpa) 33.90

(Mg/m³)

2.65

Bulk Density

Notes:

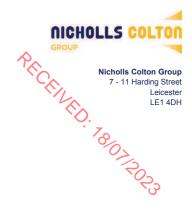
Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC12 Depth (m): 6.30m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements Sketch of Failure Surfaces Length 218 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 634 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 634000 8167.14 1000 x P $\prod x (\emptyset/2)^2$ (Mpa) 77.59 (Mg/m³)2.67 **Bulk Density**

Notes:

Uniaxial Compression Test Report Sheet I.G.S.L. PRICEINED: 78/07/2023 Sample Identification Contract Name: Liffey Park Technology Campus Job Number: 22150 Hole No: RC12 Depth (m): 7.00m Sample Description Colour: Dark grey Fine-grained Grain size: Weathering Grade: Fresh LIMESTONE Rock Type: Weathering Grade Criteria I. Fresh: Unchanged from original state Slight discolouration, slight weakening II. Slightly weathered: III. Moderately weathered: Considerable weakening, penetrative discolouration IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand Sample Measurements Sketch of Failure Surfaces Length 256 Diameter (Ø) 102 mm **Testing** kN/min Load Rate 4.3 461 kΝ Load at Failure (P) Strength Calculations Uniaxial Compressive Strength = 461000 8167.14 1000 x P $\prod x (\emptyset/2)^2$ 56.42 (Mpa) (Mg/m³)2.67 **Bulk Density**

Notes:





IGSL Unit F M7 Business Park Nass

Analytical Test Report: L19/2708/IGS/001

Your Project Reference: 22150 - Liffey Park Technology

Campus

Samples Received on: 25/11/2019

Your Order Number: 16823 Testing Instruction Received: 25/11/2019

Report Issue Number: 1 Sample Tested: 25/11 to 02/12/2019

Samples Analysed: 2 aggregate samples Report issued: 02/12/2019

Signed

Peter Swanston

Environmental Laboratories Manager

Nicholls Colton Group

Notes:

General

 $Please\ refer\ to\ Methodologies\ tab\ for\ details\ pertaining\ to\ the\ analytical\ methods\ undertaken.$

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Samples were supplied by customer, results are representative of the material provided

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 24.01.2017

Owned by Emily Blissett - Customer Services Supervisor Authorised by James Gane - Commercial Manager

J:\Public\Projects\2019\L19\IGS - IGSL Ltd\L19-2707-IGS\[L19-2707-IGS-001.xlsx]Cover Sheet





L19/2708/IGS/001

Project Reference - 22150 - Liffey Park Technology Campus

Analytical Test Results - Aggregate Testing

NC Reference			64185	64186	· Oz
Sample Ref			RC01-4.30m	RC06-6.00m	
Material			Core	Core	
Source/Client Ref			RC01-4.30m	RC06-6.00m	
Sample Description			Grey rock core	Grey rock core	
EN 1744 Determinations	Units	Accreditation			
Total Sulphur content (as S)	(%)	UKAS	1.10	0.97	
Acid soluble sulphate content (as SO ₃)	(%)	UKAS	0.10	0.10	
Acid soluble sulphate content (as SO ₄)	(%)	u	0.12	0.12	
Water soluble sulphate content (as SO ₃)	(%)	UKAS	< 0.01	0.04	
Water soluble sulphate content (as SO ₃)	(mg/l)	u	< 50	179	
Water soluble sulphate content (as SO ₄)	(%)	u	< 0.01	0.04	
Water soluble sulphate content (as SO ₄)	(mg/l)	u	< 60	215	





L19/2708/IGS/001

Project Reference - 22150 - Liffey Park Technology Campus

Analysis Methodologies and Notes

Determinant	Test method and notes	7023
EN 1744 Total Sulphur	Testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 11.	
EN 1744 Acid Soluble Sulphate	Testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 12.	
EN 1744 Water Soluble Sulphate	Testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 10.	

PROENED. 78072023

Appendix 10

Chemical & Environmental Laboratory Testing (Chemtest Laboratory)

Report No. 22150 23 | P a g e





Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Tel: 01638 606070 mail: info@chemtest.com

Final Report

Report No.: 19-42101-1

Initial Date of Issue: 08-Jan-2020

Client IGSL

Client Address: M7 Business Park

Naas

County Kildare

Ireland

Contact(s): Darren Keogh

Project Liftey Park

Quotation No.: Date Received: 17-Dec-2019

Order No.: Date Instructed: 18-Dec-2019

No. of Samples: 2

Turnaround (Wkdays): 7 Results Due: 03-Jan-2020

Date Approved: 08-Jan-2020

Approved By:

Details: Glynn Harvey, Laboratory Manager



Results - Leachate

Project: Liftey Park

Client: IGSL			ob No.:	19-42101	19-42101		
Quotation No.:		(Chemte	st Sam	ple ID.:	944874	944875
				ample Lo		ВН9	BH10
				Sample	е Туре:	SOIL	SOIL
				Top Dep	oth (m):	0.10	0.50
Determinand	Accred.	SOP	Type	Units	LOD		
Total Dissolved Solids	N	1020	10:1	mg/l	1.0	120	390
Chloride	U	1220	10:1	mg/l	1.0	< 1.0	< 1.0
Fluoride	U	1220	10:1	mg/l	0.050	0.15	0.20
Sulphate	U	1220	10:1	mg/l	1.0	68	310
Arsenic (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Barium (Dissolved)	U	1450	10:1	μg/l	5.0	10	26
Cadmium (Dissolved)	U	1450	10:1	μg/l	0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Mercury (Dissolved)	U	1450	10:1	μg/l	0.50	< 0.50	< 0.50
Molybdenum (Dissolved)	U	1450	10:1	μg/l	1.0	2.7	4.9
Nickel (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Antimony (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	10:1	μg/l	1.0	2.9	1.4
Zinc (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	4.7
Dissolved Organic Carbon	U	1610	10:1	mg/l	2.0	22	6.1
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

PECENED. 78/07/2023



Client: IGSL			mtest Jo	19-42101	19-42101	
Quotation No.:	(st Sam	944874	944875	
		Sample Location:			BH9	BH10
				е Туре:	SOIL	SOIL
			Top Dep	oth (m):	0.10	0.50
			Asbest	os Lab:	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	8.1	5.9
рН	U	2010		4.0	8.6	10.5
Arsenic	U	2450	mg/kg	1.0	21	17
Barium	U		mg/kg	10	29	49
Cadmium	U	2450	mg/kg	0.10	1.4	0.38
Mercury Low Level	U	2450	mg/kg	0.05	0.05	< 0.05
Molybdenum	U	2450	mg/kg	2.0	3.1	< 2.0
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	39	11
Nickel	U	2450	mg/kg	0.50	34	22
Lead	U		mg/kg	0.50	15	5.3
Selenium	U	2450	mg/kg	0.20	1.5	0.81
Zinc	U	2450	mg/kg	0.50	51	20
Chromium (Trivalent)	N	2490	mg/kg	1.0	12	8.6
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
LOI	U	2610	%	0.10	1.6	1.2
Total Organic Carbon	U	2625	%	0.20	1.2	0.59
Mineral Oil	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6	N	_	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	_	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	_	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	_	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N		mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	_	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N		mg/kg	5.0	< 5.0	< 5.0



Project: Liftey Park

Client: IGSL		Che	mtest J	19-42101	19-42101	
Quotation No.:	(Chemtest Sample ID.:				944875
		Sa	ample Lo	ocation:	BH9	BH10
			Sampl	е Туре:	SOIL	SOIL
			Top De	oth (m):	0.10	0.50
			Asbest	os Lab:	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	μg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	μg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	μg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzoanthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzopyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10

PECENED. 78/07/2023



Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	рН	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21- C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; BenzoAnthracene*; BenzoPyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS



Test Methods

SOP	Title	Parameters included	Method summary
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
			<u>.</u>
			1802/SO23
			703
			0

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Report Information

Key

- **UKAS** accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- PRICEINED TOON S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
 - < "less than"
 - > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to: customerservices@chemtest.com



Chemtest The right chemistry to deliver results

Depot Road Newmarket CB8 0AL Tel: 01638 606070

Tel: 01638 606070 Email: info@chemtest.com

Final Report

Report No.: 19-42283-1

Initial Date of Issue: 09-Jan-2020

Client IGSL

Client Address: M7 Business Park

Naas

County Kildare

Ireland

Contact(s): Darren Keogh

Project Liffey Park

Quotation No.: Date Received: 19-Dec-2019

Order No.: Date Instructed: 19-Dec-2019

No. of Samples: 2

Turnaround (Wkdays): 7 Results Due: 06-Jan-2020

Date Approved: 09-Jan-2020

Approved By:

Details: Glynn Harvey, Laboratory Manager



Results - Leachate

Client: IGSL			ob No.:	19-42283	19-42283		
Quotation No.:		-	Chemte	st Sam	ple ID.:	945664	945665
				ample Lo		BH7	BH8
				Sampl	е Туре:	SOIL	SOIL
				Top De	oth (m):	0.50	0.50
Determinand	Accred.	SOP	Type	Units	LOD		
Total Dissolved Solids	N	1020	10:1	mg/l	1.0	180	480
Chloride	U	1220	10:1	mg/l	1.0	1.2	2.0
Fluoride	U	1220	10:1	mg/l	0.050	0.29	0.40
Sulphate	U	1220	10:1	mg/l	1.0	110	390
Arsenic (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	10:1	μg/l	0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Mercury (Dissolved)	U	1450	10:1	μg/l	0.50	< 0.50	< 0.50
Nickel (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	10:1	μg/l	1.0	1.6	1.1
Zinc (Dissolved)	U	1450	1.0	1.7	14		
Dissolved Organic Carbon	U	1610	10:1	mg/l	2.0	3.0	2.3
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030



Project: Liffey Park						
Client: IGSL			ntest Jo		19-42283	19-42283
Quotation No.:	(st Sam		945664	945665
	Sample Location:				BH7	BH8
				е Туре:	SOIL	SOIL
			Top Dep	oth (m):	0.50	0.50
			Asbest	os Lab:	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-
Moisture	N	2030	%	0.020	4.9	4.0
На	U	2010		4.0	8.1	8.3
Arsenic	U		mg/kg	1.0	26	29
Barium	U	2450	mg/kg	10	44	52
Cadmium	Ü	2450	mg/kg	0.10	0.37	0.23
Mercury Low Level	U	2450	mg/kg	0.05	< 0.05	< 0.05
Molybdenum	Ü	2450	mg/kg	2.0	2.1	< 2.0
Antimony	N	2450	mg/kg	2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	27	10
Nickel	U	2450	mg/kg	0.50	15	15
Lead	U		mg/kg	0.50	6.9	2.9
Selenium	U		mg/kg	0.20	< 0.20	0.23
Zinc	U	2450	mg/kg	0.50	22	11
Chromium (Trivalent)	N	2490	mg/kg	1.0	8.9	8.7
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
LOI	U	2610	%	0.30	0.82	0.93
Total Organic Carbon	U	2625	%	0.10	1.3	1.5
Mineral Oil	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6		_				
Aliphatic TPH >C5-C6 Aliphatic TPH >C6-C8	N N	2680	mg/kg	1.0	< 1.0 < 1.0	< 1.0 < 1.0
		2680	mg/kg		_	
Aliphatic TPH > C8-C10	U		mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH > C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH > C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	U		mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0



Client: IGSL		Che	mtest Jo	19-42283	19-42283	
Quotation No.:	(st Sam		945664	945665
		Sa	ample Lo		BH7	BH8
				е Туре:	SOIL	SOIL
			Top Dep	oth (m):	0.50	0.50
			Asbest	os Lab:	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	μg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	μg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	μg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	μg/kg	1.0	< 1.0	< 1.0
Naphthalene	N	2800		0.010	0.01	< 0.010
Acenaphthylene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Acenaphthene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Fluorene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Phenanthrene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Anthracene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Fluoranthene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Pyrene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Benzoanthracene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Chrysene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Benzopyrene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Coronene	N	2800	mg/kg	0.010	< 0.010	< 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	< 0.20	< 0.20
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010
PCB 138	U	2815		0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10

PECENED. 18/07/2023



Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	рН	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3- band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21- C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; BenzoAnthracene*; BenzoPyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS



Test Methods

SOP	Title	Parameters included	Method summary
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
			<u>.</u>
			1802/SO23
			703
			0

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Report Information

Key

- **UKAS** accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- PRICEINED TOON S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
 - < "less than"
 - > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to: customerservices@chemtest.com



Chemtest The right chemistry to deliver results

Depot Road Newmarket CB8 0AL Tel: 01638 606070

Tel: 01638 606070 Email: info@chemtest.com

Final Report

Report No.: 19-42454-1

Initial Date of Issue: 14-Jan-2020

Client IGSL

Client Address: M7 Business Park

Naas

County Kildare

Ireland

Contact(s): Darren Keogh

Project 22150 Liffey Park Technology Park

Leixlip

Quotation No.: Q19-18246 Date Received: 19-Dec-2019

Order No.: Date Instructed: 23-Dec-2019

No. of Samples: 11

Turnaround (Wkdays): 7 Results Due: 08-Jan-2020

Date Approved: 14-Jan-2020

Approved By:

Details: Glynn Harvey, Laboratory Manager



Results - Leachate

Project: 22150 Liffey Park Technology Park Leixlip

Project: 22150 Liffey Park I	echhology	FAIR L					
Client: IGSL				mtest Jo		19-42454	19-42454
Quotation No.: Q19-18246		(st Sam		946458	946468
Order No.:			Clie	AA118621	AA120065		
			Sa	ample Lo	ocation:	TP02	BH09
					e Type:	SOIL	SOIL
				Top De	oth (m):	0.15	2.00
Determinand	Accred.	SOP	Type	Units	LOD		
Total Dissolved Solids	N	1020	10:1	mg/l	1.0	42	65
Chloride	U	1220	10:1	mg/l	1.0	< 1.0	< 1.0
Fluoride	U	1220	10:1	mg/l	0.050	0.15	0.11
Sulphate	U	1220	10:1	mg/l	1.0	1.6	24
Arsenic (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Barium (Dissolved)	U	1450	10:1	μg/l	5.0	< 5.0	5.6
Cadmium (Dissolved)	U	1450	10:1	μg/l	0.080	< 0.080	0.13
Chromium (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Mercury (Dissolved)	U	1450	10:1	μg/l	0.50	< 0.50	< 0.50
Molybdenum (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	1.2
Nickel (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Antimony (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	1.6
Zinc (Dissolved)	U	1450	10:1	μg/l	1.0	< 1.0	< 1.0
Dissolved Organic Carbon	U	1610	10:1	mg/l	2.0	5.8	4.6
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

PECENED. 78/07/2023



Client (ISL Chemites Job No.: 1942/266 1942/265	Project: 22150 Liffey Park Technology	Park Leixii	<u>p</u>												
Other No:			Che	mtest Jo	ob No.:	19-42454		19-42454	19-42454		19-42454		19-42454	19-42454	19-42454
Sample Localion: TPSQ TPSQO TPSQO TPSQO TPSQO TPO TPSQ TPO	Quotation No.: Q19-18246	(946458	946459	946460	946461	946462	946463	946464	946465	946466	946467
Sample Type SOIL	Order No.:					AA118621	AA128607	AA128602	AA128603	AA108760	AA116287	AA1,16273	AA116274	AA118605	AA118606
Top Determinan			Sa	ample Lo	ocation:	TP02	TPSA01	TPSA04	TPSA04	TP06	TP07	TP08	TP08	TP10	TP10
Determinan				Sample	е Туре:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOK	SOIL	SOIL	SOIL
Determinand Acord, SOP U12 192 N/N Acord Abbastos Acord Acor				Top Dep	oth (m):	0.15	1.00	0.60	1.40	0.80	0.20	0.50 7	1.00	0.20	0.80
ASM-type U 2192 W NA				Asbest	os Lab:	COVENTRY		COVENTRY			COVENTRY	COVENTRY	0.	COVENTRY	
ASM Type U 2192 N NA NA NA NA NA NA	Determinand	Accred.	SOP	Units	LOD										
Asbestos Identification U 2192 % 0.001 NoAsbestos Detected Detected	ACM Type	U	2192		N/A	-							500		
Moisture		U	2192	%	0.001								73		
pH Description Description	ACM Detection Stage	U	2192		N/A	-									
PH (2.5-1)	Moisture	N	2030	%	0.020	25	19	17	13	8.1	2.6	19	28	13	22
Magnesium (Water Soluble) N 2120 gl 0.010	рН	U	2010		4.0	7.9									
Magnesium (Water Soluble) N 2120 gl 0.010	pH (2.5:1)	N						8			8.7	8		8	
Sulphate (2-1 Water Soluble) as SO4		N		g/l	0.010			1.2			0.81	0.78		0.98	
Total Sulphur U 275 % 0.010 0.093 < 0.010 0.071 0.072 0.023 0.21 0.067 0.011 0.12 0.017	Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.057	0.021	0.068	0.10	0.011	0.026	0.037	0.19	0.038	0.024
Chloride (Water Soluble)	Total Sulphur	U	2175		0.010	0.093	< 0.010	0.071	0.072	0.023	0.21	0.067	0.11	0.12	0.017
Nitrate (Water Soluble)		U		g/l				< 0.010			< 0.010	< 0.010		< 0.010	
Ammonium (Water Soluble) U 2430 g/l 0.01 0.033 0.081 0.056 0.011 0.017 0.066 0.06 0.073 0.04		N						< 0.010			< 0.010	< 0.010			
Sulphate (Acid Soluble)		U						0.80			0.55	0.36		0.57	
Arsenic U 2450 mg/kg 1.0 20	,	U				0.13	0.033	0.081	0.056	0.011	0.017	0.066	0.16	0.073	0.04
Barium	,	U		ma/ka		20									
Cadmium U 2450 mg/kg loss 0.10 loss 2.3 loss Image: Composition of the compo	Barium				10										
Mercury Low Level		U													
Molybdenum	Mercury Low Level	U													
Antimony N 2450 mg/kg 2.0 < < 2.0		U				3.3									
Copper U 2450 mg/kg mg/kg 0.50 38 Image: Composition of the control of the con		N	2450	mg/kg	2.0	< 2.0									
Nickel U 2450 mg/kg 0.50 466	,	U			0.50	38									
Lead U 2450 mg/kg 0.50 68	• •	U													
Selenium		U													
Zinc U 2450 mg/kg 0.50 mg/kg 100 mg/kg 1.0 mg/kg		Ü													
Chromium (Trivalent) N 2490 mg/kg 1.0 17	Zinc	U			0.50	100									
Chromium (Hexavalent) N 2490 mg/kg 0.50 < 0.50 </td <td>Chromium (Trivalent)</td> <td>N</td> <td></td> <td></td> <td>1.0</td> <td>17</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Chromium (Trivalent)	N			1.0	17									
LOI U 2610 % 0.10 8.5 Image: Control of the co	, ,	N			0.50										
Total Organic Carbon U 2625 % 0.20 3.1	,														
Mineral Oil N 2670 mg/kg 10 < 10 S S S S S S S S S															
Aliphatic TPH >C5-C6 N 2680 mg/kg 1.0 < 1.0			_												
Aliphatic TPH > C6-C8 N 2680 mg/kg 1.0 < 1.0															
Aliphatic TPH >C8-C10 U 2680 mg/kg 1.0 < 1.0															
Aliphatic TPH >C10-C12 U 2680 mg/kg 1.0 < 1.0															
Aliphatic TPH >C12-C16 U 2680 mg/kg 1.0 < 1.0															
Aliphatic TPH >C16-C21 U 2680 mg/kg 1.0 < 1.0															
Aliphatic TPH >C21-C35 U 2680 mg/kg 1.0 < 1.0			_												
Aliphatic TPH >C35-C44 N 2680 mg/kg 1.0 < 1.0			_												
								1							



The right chemistry to deliver results
Project: 22150 Liffey Park Technology Park Leixlip

Project: 22150 Liffey Park Technology I	Park Leixii	<u>p</u>												
Client: IGSL		Che	mtest J	ob No.:	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454
Quotation No.: Q19-18246	(Chemte	est Sam	ple ID.:	946458	946459	946460	946461	946462	946463	946464	946465	946466	946467
Order No.:		Clie	nt Samp	le Ref.:	AA118621	AA128607	AA128602	AA128603	AA108760	AA116287	AA116273	AA116274	AA118605	AA118606
		S	ample Lo	ocation:	TP02	TPSA01	TPSA04	TPSA04	TP06	TP07	TP08	TP08	TP10	TP10
				e Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIC	SOIL	SOIL	SOIL
	Top Depth (m):				0.15	1.00	0.60	1.40	0.80	0.20	0.50	1.00	0.20	0.80
			Asbest	os Lab:	COVENTRY		COVENTRY			COVENTRY	COVENTRY		COVENTRY	
Determinand	Accred.	SOP	Units	LOD										
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0						1	TO 2		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0						1	7,3		
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0									
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0									
Aromatic TPH >C12-C16	Ü	2680	mg/kg	1.0	< 1.0									
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0			1			1		1	
Aromatic TPH >C21-C35	Ü	2680	mg/kg	1.0	< 1.0			1			1			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0			 			 		<u> </u>	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0						 			
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10			 			 			
Benzene	U	2760	µg/kg	1.0	< 1.0			 			 			
Toluene	U	2760	μg/kg	1.0	< 1.0							l 		
Ethylbenzene	U	2760	μg/kg	1.0	< 1.0						1			
m & p-Xylene	U	2760	μg/kg	1.0	< 1.0									-
o-Xylene	U	2760	μg/kg	1.0	< 1.0									-
Methyl Tert-Butyl Ether	U	2760	μg/kg	1.0	< 1.0						1			
Naphthalene	N	2800	mg/kg	_	0.21									
Acenaphthylene	N	2800			0.05									
Acenaphthene	N	2800	mg/kg		0.03									
Fluorene	N	2800	mg/kg	0.010	0.11			-			<u> </u>		-	
Phenanthrene	N	2800	mg/kg	0.010	0.09			-			<u> </u>		-	
Anthracene	N	2800	mg/kg	0.010	0.79			-			<u> </u>		-	
Fluoranthene	N	2800	mg/kg		0.14						<u> </u>			
Pyrene	N	2800		0.010	0.96									
•	N	2800	mg/kg		0.65									
Benzoanthracene		2800	mg/kg		0.43									
Chrysene	N	2800	mg/kg	0.010										
Benzo[b]fluoranthene	N		mg/kg		0.25									
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	0.1						-			
Benzopyrene	N	2800	mg/kg	0.010	0.26			 			 			
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	0.24									
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	< 0.010			 			 		ļ	
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	0.25						ļ			
Coronene	N	2800	mg/kg		< 0.010						-			
Total Of 17 PAH's	N	2800	mg/kg		5.2			<u> </u>			ļ			
PCB 28	U	2815		0.010	< 0.010						-			
PCB 52	U	2815		0.010	< 0.010			<u> </u>			ļ			_
PCB 90+101	U	2815	0 0	0.010	< 0.010									
PCB 118	U	2815	mg/kg	0.010	< 0.010									ļ
PCB 153	U	2815	mg/kg	0.010	< 0.010									



Results - Soil

Client: IGSL		Che	mtest J	ob No.:	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454	19-42454
Quotation No.: Q19-18246		Chemtest Sample ID.:			946458	946459	946460	946461	946462	946463	946464	946465	946466	946467
Order No.:		Client Sample Ref.:			AA118621	AA128607	AA128602	AA128603	AA108760	AA116287	AA116273	AA116274	AA118605	AA118606
		Sa	ample Lo	ocation:	TP02	TPSA01	TPSA04	TPSA04	TP06	TP07	TP08	TP08	TP10	TP10
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOK).	SOIL	SOIL	SOIL
		Top Depth (m): Asbestos Lab: 0		0.15	1.00	0.60	1.40	0.80	0.20	0.50	1.00	0.20	0.80	
				COVENTRY		COVENTRY			COVENTRY	COVENTRY	0.	COVENTRY		
Determinand	Accred.	SOP	Units	LOD								1		
PCB 138	U	2815	mg/kg	0.010	< 0.010							Pos		
PCB 180	U	2815	mg/kg	0.010	< 0.010							B		
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10					·				



Client: IGSL		ob No.:	19-42454		
Quotation No.: Q19-18246	(Chemte	st Sam	ple ID.:	946468
Order No.:		Clie	nt Samp	le Ref.:	AA120065
		BH09			
			Sample	е Туре:	SOIL
			Top Dep	oth (m):	2.00
			Asbest		COVENTRY
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-
Moisture	N	2030	%	0.020	7.5
pH	U	2010		4.0	8
pH (2.5:1)	N	2010		4.0	
Magnesium (Water Soluble)	N	2120	g/l	0.010	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	
Total Sulphur	U	2175	%	0.010	
Chloride (Water Soluble)	U	2220	g/l	0.010	
Nitrate (Water Soluble)	N	2220	g/l	0.010	
Ammonium (Water Soluble)	U	2120	g/l	0.01	
Sulphate (Acid Soluble)	U	2430	%	0.010	
Arsenic	U	2450		1.0	20
Barium	U	2450		10	17
Cadmium	U	2450		0.10	0.91
Mercury Low Level	U	2450		0.05	< 0.05
Molybdenum	Ü	2450		2.0	3.8
Antimony	N	2450		2.0	< 2.0
Copper	U	2450		0.50	24
Nickel	Ü	2450	mg/kg	0.50	53
Lead	Ü	2450		0.50	8.3
Selenium	Ü	2450	0 0	0.20	1.8
Zinc	U	2450		0.50	37
Chromium (Trivalent)	N	2490		1.0	8.1
Chromium (Hexavalent)	N	2490		0.50	< 0.50
LOI	U	2610	%	0.10	2.7
Total Organic Carbon	Ü	2625	%	0.20	1.1
Mineral Oil	N	2670		10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680		1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	Ü	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	U	2680		1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
/ IIIDIIGIO II II / OOO-OTT	IN	2000	iliy/ny	1.0	- 1.0

PECENED. 78/07/2023



Client: IGSL		Chemtest Job No.:							
Quotation No.: Q19-18246	(Chemte	st Samı	ple ID.:	946468				
Order No.:		Clie	nt Samp	le Ref.:	AA120065				
		Sa	ample Lo	ocation:	BH09				
				е Туре:	SOIL				
			Top Dep	oth (m):	2.00				
			Asbest	os Lab:	COVENTRY				
Determinand	Accred.	SOP	Units	LOD					
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0				
Aromatic TPH >C35-C44	N	2680		1.0	< 1.0				
Total Aromatic Hydrocarbons	N	2680		5.0	< 5.0				
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10				
Benzene	U	2760	μg/kg	1.0	< 1.0				
Toluene	U	2760		1.0	< 1.0				
Ethylbenzene	U	2760	μg/kg	1.0	< 1.0				
m & p-Xylene	U	2760		1.0	< 1.0				
o-Xylene	U	2760	µg/kg	1.0	< 1.0				
Methyl Tert-Butyl Ether	U	2760	μg/kg	1.0	< 1.0				
Naphthalene	N	2800		0.010	0.07				
Acenaphthylene	N	2800	mg/kg	0.010	< 0.010				
Acenaphthene	N	2800	mg/kg	0.010	0.04				
Fluorene	N	2800	mg/kg	0.010	0.04				
Phenanthrene	N	2800	mg/kg	0.010	0.21				
Anthracene	N	2800	mg/kg	0.010	0.12				
Fluoranthene	N	2800	mg/kg	0.010	0.26				
Pyrene	N	2800	mg/kg	0.010	0.19				
Benzoanthracene	N	2800	mg/kg	0.010	0.04				
Chrysene	N	2800	mg/kg	0.010	0.05				
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	< 0.010				
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	< 0.010				
Benzopyrene	N	2800	mg/kg	0.010	< 0.010				
Indeno(1,2,3-c,d)Pyrene	N	2800			< 0.010				
Dibenz(a,h)Anthracene	N	2800			< 0.010				
Benzo[g,h,i]perylene	N	2800			< 0.010				
Coronene	N	2800			< 0.010				
Total Of 17 PAH's	N	2800		0.20	1				
PCB 28	U	2815	mg/kg	0.010	< 0.010				
PCB 52	U	2815			< 0.010				
PCB 90+101	U	2815			< 0.010				
PCB 118	U	2815			< 0.010				
PCB 153	U	2815			< 0.010				

P.E.C.E.N.E.D. 78/07/2023



Results - Soil

Client: IGSL		Che	mtest Jo	ob No.:	19-42454		
Quotation No.: Q19-18246	(Chemtest Sample ID.					
Order No.:		Client Sample Ref.:					
		Sample Location: Sample Type:					
			SOIL				
		Top Depth (m):					
			Asbest	os Lab:	COVENTRY		
Determinand	Accred.	Accred. SOP Units LOD					
PCB 138	U	2815	mg/kg	0.010	< 0.010		
PCB 180	U	2815	mg/kg	0.010	< 0.010		
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10		



Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	determination by inductively coupled plasma
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	рН	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5-C6, >C6-C8,>C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21- C35, >C35- C44Aromatics: >C5-C7, >C7-C8, >C8-C10, >C10-C12, >C12-C16, >C16-C21, >C21-C35, >C35-C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.



Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; BenzoAnthracene*; BenzoPyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge



Report Information

Key

- **UKAS** accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- PRICEINED TOON S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
 - < "less than"
 - > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A Date of sampling not supplied
- B Sample age exceeds stability time (sampling to extraction)
- C Sample not received in appropriate containers
- D Broken Container
- E Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

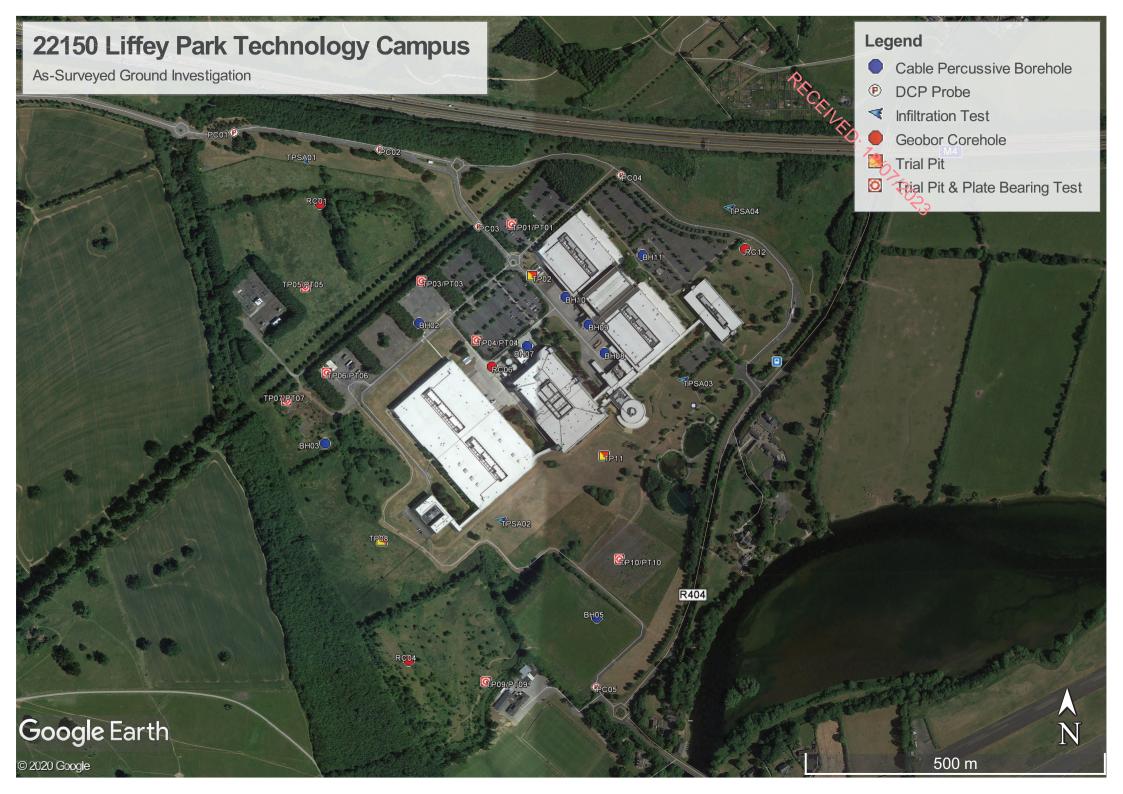
If you require extended retention of samples, please email your requirements to: customerservices@chemtest.com

PRICENED. 78/07/2023

Appendix 11

As-Surveyed Site Plan

Report No. 22150 24 | P a g e



Groundwater Monitoring in Standpipes

Project No. 22150 Client	Site Location	Liffey Park Technology Campus
	Project No.	22150
	Client	
Engineer Arup	Engineer	Arup



			Date of	Monitoring	9					
			12/1	11/2019	25/11	/2019				
Exploratory Hole No.	Fround Level (m OD	Standpipe	(m bgl)	(m OD)	(m bgl)	(m OD)	(m bgl)	(m OD)	(m bgl)	(m OD)
BH01	55.973	SP 50mm	0.50	55.47	0.49	55.48				
BH04	52.579	SP 50mm	0.51	52.07	0.54	52.04				
BH06	50.683	SP 19mm	1.53	49.15	1.59	49.09				
BH12	49.451	SP 50mm	2.38	47.07	2.49	46.96				



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTR				chnology C						 -	;	SHEET	HOLE N	. . .	BH03 Sheet 1 of 1	
	DINATE		734,68	60.26 E 88.40 N 54.24		RIG TYPI BOREHO BOREHO	LE DIAM		nm)	DANDO 2 3.00			COMME		ED 18/11/2019 D 18/11/2019	
CLIENT		O' Fly Arup	nn Group)		SPT HAN	IMER REI	F. NO.				BOREI	D BY ESSED	BY	W.BUTLER	
		лицр					10.1110 (/				Sam				2	
Depth (m)			Desc	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth	(III)	2000	Field Test Results	Standpipe Details
								ă	ă	žž	ഗ്≏്	٤۵		2		ty C
	PSOIL		OL 4)/				7/1 /N - 7/1 /N - 7/	54.04	0.20							
30	oft brown	i sandy	CLAT				<u></u>									
1																
So	oft grey/bavel	rown	sandy SIL	T/CLAY wi	ith some fi	ine		53.04	1.20	_					N = 7 (2, 3, 3, 2, 1, 1)	
So	oft to firm	dark	brown gra	avelly CLA	Y			52.64	1.60							
² Fir	m brow	n grave	elly CLAY	with some	cobbles.		<u> </u>	52.24	2.00						N = 7 (1, 0, 1, 1, 2, 3)	
Sti	iff black	sandy	gravelly	CLAY with:	some cobl	bles.		51.74	2.50	-						
3 Or		ction Borehole at 3.00 m					<u> </u>	51.24	3.00						N = 60/150 mm (30, 40, 10, 50)	
5	CTDAT			TI I INO												
	1		ING/CHIS				Wate	ir Ca	sing	Sealed	Rise	. ا خ	Time		TER STRIKE DETA	AILS
2.9	n) To (r 3	n) '	(h) C	omments			Strike		epth	At	To		(min)		mments o water strike	
														140	o water strike	
									Hela		-	1	G	ROL	JNDWATER PRO	GRES
INSTAL Date	LATION Tip			RZ Base	Тур	е	Dat	e	Hole Depth	Casing Depth	Dep W	oth to ater	Comm	nents	6	
	N/C ^:			lion and ha			.,		16	le Legen Disturbed (tub)	<u>. </u>					



REPORT NUMBER

22150

BOREHOLE NO. **BH05** CONTRACT Liffey Park Technology Campus SHEET Sheet 1 of 1 **DANDO 2000 RIG TYPE CO-ORDINATES** 699,017.14 E DATE COMMENCED 06/11/2019 **BOREHOLE DIAMETER (mm)** 734,408.45 N 200 DATE COMPLETED 06/11/2019 **GROUND LEVEL (m AOD)** 48.98 **BOREHOLE DEPTH (m)** 2.90 O' Flynn Group SPT HAMMER REF. NO. **BORED BY** W.BUTLER **CLIENT ENERGY RATIO (%) ENGINEER PROCESSED BY** 25C Arup Samples Standpipe Details Ξ $\widehat{\Xi}$ Elevation Ref. Number Sample Type Recovery Field Test Legend Depth (Depth (Description Depth (m) Results _ 0 TOPSOIL 711. 711. 48.78 0.20 Soft to firm grey/brown sandy SILT/CLAY with some XO fine gravel _____ ō AA120053 В 1.00 (2, 1, 2, 2, 3, 3) -xo 47.38 1.60 Very stiff brown gravelly CLAY with occasional 0-_0_ cobbles 46.98 __ 2.00 N = 50/150 mm AA120054 В 2.00 Very stiff to hard black sandy gravelly CLAY with Ö. (4, 4, 16, 34) <u></u> some cobbles _0_ $\overline{\odot}$ 46.08 2.90 · ^ N = 50/75 mmAA120055 В 2.90 Obstruction (25, 50) End of Borehole at 2.90 m 4 5 6 HARD STRATA BORING/CHISELLING WATER STRIKE DETAILS Water Casing Sealed Rise Time Time Comments From (m) To (m) Comments Strike Depth То (h) Αt (min) 2.6 29/11/19 2.5 0.75 No water strike 2.8 2.9 2 IGSL.GDT **GROUNDWATER PROGRESS** Hole Casing Depth to Water 22150.GPJ **INSTALLATION DETAILS** Comments Date Depth Depth Date Tip Depth RZ Top RZ Base Туре LOG **REMARKS** CAT scanned location and hand dug inspection pit carried out . Sample Legend 표 D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Samp UT - Undisturbed 100mm Diamete Sample P - Undisturbed Piston Sample IGSL ntal Sample (Jar + Vial + Tub) W - Water Sample



REPORT NUMBER

	RACT			chnology C							;	BOREH SHEET		D. BH07 Sheet 1 of 1	
	RDINAT	ES /EL (m /	734,85	91.78 E 56.93 N 49.87	В		E LE DIAMI LE DEPT		nm) 2	DANDO 2 200 1.70		DATE C			
CLIEN		O' Fly Arup	nn Group)			IMER REI RATIO (%					BORED PROCE:		W.BUTLER	
=								_	<u> </u>		Sam	nples		200	lω
Deptin (m)			Desc	cription			Legend	Elevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe
			consistir	ng of reinfo	rced			49.67	0.20						
	CONCRI) (Compri	sed of ang	ular stone fill			48.67	1.20	AA120062	В	1.00		N = 50/225 mm (13, 15, 19, 17, 14)	
			OBBLES	and bould	ers	,		48.17	1.70	AA120063	В	1.50		N = 50/75 mm	
	bstruct nd of B		at 1.70 m	1										(25, 50)	
3															
5															
	O.T.	TA DOD		EL NO											
			ING/CHIS				Wate		sing S	Sealed	Rise	e T	: I	ATER STRIKE DET	AILS
1.3 1.5	1	(m)	(h) 0.5 1.5	omments			Strike		epth	At	То		min)	Comments No water strike	
1.5	'		1.5												
VICT 1		AL DET	\ <u></u>						Hole	Casing	Der	oth to		ROUNDWATER PRO	GRE
NSTA Da		p Depth		RZ Base	Туре		Dat		Depth	Depth	J.W.	oth to ater	Comme	ents	
			1	1			1			I	1				



REPORT NUMBER

CONTRA	CI L	∟ittey Park T	echnology Camp							BOREHO SHEET	LE NU.	BH08 Sheet 1 of 1	
CO-ORDI GROUND			021.02 E 847.88 N 49.56		PE OLE DIAM OLE DEPT		ım)	DANDO 2 3.90	2000	DATE CO		CED 13/11/2019	
CLIENT		O' Flynn Gro	oup	1 -	MMER REI	_				BORED B		W.BUTLER	
ENGINEE	ER F	Arup		ENERG	Y RATIO (%	⁄o) 				PROCESS nples	SEDBI	OS.C	
Depth (m)		De	escription		Legend	Elevation	Depth (m)	Ref. Number	Sample Type	i 	Recovery	Field Test Results	Standpipe
CON	NCRETE	≣	sting of reinforced			49.36	0.20						
1						48.36	1.20	AA120067	В	1.00			
			AY with some cob			47.76	1.80						
Stiff 2	black sa	andy gravell	y CLAY with som	e cobbles.				AA120069	В	2.00		N = 19 (2, 3, 4, 5, 4, 6)	
3								AA120070	В	3.00		N = 34 (4, 10, 7, 3, 3, 21)	
	struction I of Bore	hole at 3.90	m			45.66	3.90	AA120071	В	3.90		(39, 50)	
5													
6													
HARD S	TRATA	BORING/CH	IISELLING								WA	ATER STRIKE DET	 AILS
rom (m)	To (m)	Time (h)	Comments		Wate Strike		sing S	Sealed At	Ris To			comments	_
3.9	3.9	1			3					(311)		No water strike	
											GRO	OUNDWATER PRO	GRE
NSTALL Date		DETAILS Depth RZ To	op RZ Base	Туре	Dat		Hole Depth	Casing Depth	De W	pth to ater C	ommer	nts	
EMARK	(S CAT	scanned lo	cation and hand c	lug inspection	pit carried	out .	LB - Larg	le Legen Disturbed (tub) Disturbed e Bulk Disturbe ironmental San	d		Sample P - Und	ndisturbed 100mm Diameter e disturbed Piston Sample ater Sample	



29/11/19

IGSL.GDT

50.GPJ

22

표

IGSL

GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

BOREHOLE NO. **BH09** CONTRACT Liffey Park Technology Campus SHEET Sheet 1 of 1 **DANDO 2000 RIG TYPE CO-ORDINATES** 698,993.19 E DATE COMMENCED 12/11/2019 **BOREHOLE DIAMETER (mm)** 734,894.47 N 200 DATE COMPLETED 12/11/2019 **GROUND LEVEL (m AOD)** 48.37 **BOREHOLE DEPTH (m)** 3.10 O' Flynn Group SPT HAMMER REF. NO. **BORED BY** W.BUTLER CLIENT **ENERGY RATIO (%) ENGINEER PROCESSED BY** 25C Arup Samples Standpipe Details Ξ $\widehat{\Xi}$ Elevation Ref. Number Sample Type Recovery Field Test Legend Depth (Depth (Description Depth (m) Results MADE GROUND consisting of reinforced 48.17 0.20 CONCRETE MADE GROUND (Comprised of angular stone fill) N = 41 (7, 8, 10, 10, 9, 12) AA120064 В 1.00 47.17 1.20 Very stiff black very sandy gravelly CLAY with <u></u> occasional angular cobbles . 6. 46.57 1.80 Dense slightly clayey gravelly angular COBBLES $\overline{\circ}$ $\overline{-0}$ AA120065 В 2.00 N = 51┌2 (10, 9, 9, 12, 15, 15) \bigcirc 0 $\overline{\phi}$ N = 70/150 mm (14, 14, 20, 50) 45.27 3.10 AA120066 В 3.00 Obstruction End of Borehole at 3.10 m 4 5 6 HARD STRATA BORING/CHISELLING WATER STRIKE DETAILS Water Casing Sealed Rise Time Time Comments From (m) To (m) Comments Strike Depth То (h) Αt (min) 2.9 3.1 2 No water strike **GROUNDWATER PROGRESS** Hole Casing Depth to Water **INSTALLATION DETAILS** Date Comments Depth Depth Date Tip Depth RZ Top RZ Base Type 12-11-19 End of drilling 3.10 1.30 Nil **REMARKS** CAT scanned location and hand dug inspection pit carried out . Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Samp UT - Undisturbed 100mm Diamete Sample P - Undisturbed Piston Sample ntal Sample (Jar + Vial + Tub) W - Water Sample



REPORT NUMBER

												-	_				
	NTRAC				hnology Ca						55		BORE!		NO.	BH10 Sheet 1 of 1	
		NATES LEVEL (1		698,953 734,939 D)	3.96 E 9.44 N 48.36		EHOL	E DIAMI		mm)	DANDO 1.40	2000	DATE (ED 15/11/2019 ED 15/11/2019	
l	ENT SINEEF		•	Group				MER REI					BORE			W.BUTLER	
	J V.	. , , ,	<u>ч</u> Р										nples			2	
Depth (m)				Desc	ription			pue	Elevation	Depth (m)	Ref. Number	Sample	-		Recovery	Field Test Results	Standpipe Details
		- 0001						Legend		<u> </u>	Ref.	San	Depth	E .	Rec	resuits	Star Deta
_ 0 -		E GROU CRETE	ND C	onsistin	g of reinfo	rced			48.16	0.20							
- - -	MAD	E GROU	ND (C	Compris	sed of angu	ular stone fill)	_ X				AA120072	2 B	0.50	,			
_ - _ 1											AA12007	3 B	0.90	,			
	Dens	e angula	r COE	BBLES	and bould	ers			47.16							(30)	
- - -	Obsti	uction of Boreho						80	46.96	1.40	AA120074	4 В	1.40			(50)	
-																	
_2																	
-																	
-																	
3																	
-																	
-																	
-																	
-																	
4																	
-																	
-																	
_ 5 -																	
- 1																	
6																	
-																	
- 1																	
		To (m)	Tim	ne Co	ELLING omments			Wate		asing	Sealed	Ris		Time		TER STRIKE DETA	AILS
	.4	1.4	<u>(h</u>)					Strike	ם ו	epth	At	To		(min)			
															N	lo water strike	
															GRO	UNDWATER PRO	GRESS
INS	TALLA	TION DE	TAIL	s				Dat	e	Hole	Casing	ı Dé	epth to Vater	Comi			J00
	Date				RZ Base	Туре				Depth	Depth		vater	33,,,,		-	
	:	<u> </u>								1-							
REI	WARKS	S CAT s	canne	ed locati	ion and ha	nd dug inspect	ion pi	t carried	out .	Sam D - Sm	ple Leger	nd)				isturbed 100mm Diameter	
INS										LB - Bull	Disturbed rge Bulk Disturb nvironmental Sa	ed	+ Vial + Tub	F	Sample P - Undis V - Wate	turbed Piston Sample er Sample	



REPORT NUMBER

_	<u> </u>												_			
CO	NTRA	CT Li	ffey Park	k Techn	ology C	ampus							BOREH SHEET		D. BH11 Sheet 1 of 1	
		NATES LEVEL (69 73 (m AOD)	99,080.7 35,011.8 4	79 E 84 N 9.69			PE OLE DIAMI OLE DEPT		mm)	DANDO 2 200 3.50	2000	DATE C	OMME	NCED 08/11/2019	
-	ENT SINEEI		' Flynn G rup	Group				MMER REF (RATIO (%					BORED PROCE		W.BUTLER	
٦									_	ء ا		Sar	nples		200	o o
Depth (m)				Descrip	tion			Legend	Flevation	Depth (m)	Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe
1	MAD					ular ston	e fill)		49.59		AA120059) В	1.00			
2		dark bro	own/blac		Ily CLA\	Y with an	gular		<u>47.69</u>	2.00	AA120060) В	2.00		N = 28 (2, 5, 6, 7, 7, 8)	
3	Ohet	ruction							46.19	3.50	AA120061	В	3.00		N = 50/150 mm (8, 9, 34, 16)	
4 6		o Borer	ole at 3.	50 111												
НА	ARD ST	RATA B	BORING/	CHISEL	LING									v	VATER STRIKE DET	AILS
ror	m (m)	To (m)	Time (h)	Com	ments			Wate Strike		asing epth	Sealed At	Ris To		ime min)	Comments	
			(/					3						-/	No water strike	
														GF	ROUNDWATER PRO	GRE
	TALLA Date	Tip De	ETAILS epth RZ	Top R	Z Base	Ту	pe	Dat	е	Hole Depth	Casing Depth	De W	epth to Vater	Comme	ents	
REI	MARK					ınd dug iı	nspection	pit carried	out .	B - Bulk	ple Legen all Disturbed (tub Disturbed ge Bulk Disturbe			Sam	Undisturbed 100mm Diameter ple Indisturbed Piston Sample	

f -value from field tests Soakaway Design (F2C) IGS Contract: Contract No: 22150 Test No. TPSA01 735156.119 Northing: Client **ARUP** Easting: 698516.401 Date: 06/11/2019 Elevation: 56.203 Summary of ground conditions Description Ground water from to 0.25 TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet 0.00 None observed 0.25 0.40 SUBSOIL: Brown sandy gravelly CLAY. Firm brown mottled grey mottled black sandy gravelly CLAY 0.40 1.50 1.50 2.00 Firm to stiff dark grey mottled black sandy gravelly CLAY Notes: Soakaway located beside trial pit TPSA01 Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.60 (m) (min) m 0.90 0.00 Initial depth to Water = 0.90 m 0.90 1.00 0.88 Final depth to water = m 2.00 0.88 Elapsed time (mins)= 60.00 3.00 0.88 0.87 4.00 Top of permeable soil m 5.00 Base of permeable soil 0.87 0.87 10.00 15.00 0.87 0.87 20.00 25.00 0.88 0.88 30.00 Base area= 0.64 m2 0.88 35.00 *Av. side area of permeable stratum over test period 4.44 m2 0.88 40.00 Total Exposed area = 5.08 m2 0.88 50.00 0.88 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time 0 m/min f= 0 m/sec ór Water level rose during test Depth of water vs Elapsed Time (mins) 70.00 <u>@</u>60.00 **≡**50.00 **.**⊑40.00 **8**30.00 **2**0.00 10.00 0.00 0.87 0.87 0.88 0.88 0.89 0.89 0.90 0.90 0.91 Depth to Water (m)

Soakaway Design f -value from field tests (F2C) IGS Contract: 22150 Contract No: 22150 TPSA02 - Cycle 1 Test No. Northing: 734565.043 Client **ARUP** Easting: 698854.613 Date: 30/10/2019 Elevation: 51.856 Summary of ground conditions from Description Ground water to 0.00 0.30 TOPSOIL: Brown slightly sandy gravelly CLAY 0.30 MADE GROUND comprised of grey brown sandy gravelly CLAY 1.20 with occasional concrete fragments. 1.20 2.00 Firm grey slightly sandy slightly gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.95 0.00 Initial depth to Water = 0.95 m 0.95 1.00 Final depth to water = 0.96 m 0.95 2.00 Elapsed time (mins)= 60.00 0.95 3.00 4.00 0.96 Top of permeable soil m 0.96 5.00 Base of permeable soil 10.00 0.96 15.00 0.96 0.96 20.00 0.96 25.00 0.96 30.00 0.72 Base area= m2 0.96 35.00 4.598 *Av. side area of permeable stratum over test period m2 0.96 40.00 5.318 Total Exposed area = m2 0.96 50.00 0.96 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec ór No fall in water after 4 minutes Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 40.00 **8**30.00 **=**20.00 10.00 0.00 0.95 0.95 0.95 0.95 0.96 0.96 0.96 0.96 Depth to Water (m)

Soakaway Design f -value from field tests (F2C) IGS Contract: 22150 Contract No: 22150 TPSA02 - Cycle 2 Test No. Northing: 734565.043 Client **ARUP** Easting: 698854.613 Date: 30/10/2019 Elevation: 51.856 Summary of ground conditions from Description Ground water to 0.00 0.30 TOPSOIL: Brown slightly sandy gravelly CLAY 0.30 MADE GROUND comprised of grey brown sandy gravelly CLAY 1.20 with occasional concrete fragments. 1.20 2.00 Firm grey slightly sandy slightly gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) 2.00 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.83 0.00 Initial depth to Water = 0.83 m 0.83 1.00 Final depth to water = 0.84 m 0.83 2.00 Elapsed time (mins)= 60.00 3.00 0.84 4.00 0.84 Top of permeable soil m 0.84 5.00 Base of permeable soil 10.00 0.84 15.00 0.84 0.84 20.00 0.84 25.00 0.84 30.00 0.72 Base area= m2 0.84 35.00 5.126 *Av. side area of permeable stratum over test period m2 0.84 40.00 5.846 Total Exposed area = m2 0.84 50.00 0.84 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec ór No fall in water level after 3 mins Depth of water vs Elapsed Time (mins) 70.00 60.00 50.00 40.00 **8**30.00 **=**20.00 10.00 0.00 0.83 0.83 0.83 0.83 0.84 0.84 0.84 0.84 Depth to Water (m)

f -value from field tests Soakaway Design (F2C) IGS Contract: 22150 Contract No: 22150 Test No. TPSA03 - Cycle 1 Northing: 699153.058 Client **ARUP** Easting: 734803.725 Date: 29/10/2019 Elevation: 49.262 Summary of ground conditions from to Description Ground water 0.00 0.20 TOPSOIL: Brown slightly sandy CLAY with occasional rootlets. Seepage in MADE 0.20 0.70 MADE GROUND comprised of brownish grey slightly sandy gravelly CL GROUND at 0.5m 0.70 1.50 Firm brown mottled black sandy gravelly CLAY 1.50 1.80 Firm to stiff dark grey slightly sandy very gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) Depth to Elapsed 1.80 Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.74 0.00 Initial depth to Water = 0.74 m 0.74 1.00 Final depth to water = 0.79 m 0.75 2.00 Elapsed time (mins)= 60.00 0.76 3.00 0.76 4.00 Top of permeable soil m 0.76 5.00 Base of permeable soil 0.77 10.00 15.00 0.77 0.77 20.00 0.77 25.00 0.77 0.72 30.00 Base area= m2 0.78 35.00 *Av. side area of permeable stratum over test period 4.554 m2 5.274 0.78 40.00 Total Exposed area = m2 0.78 50.00 0.79 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f = 0.00011 m/min1.896E-06 m/sec or Depth of water vs Elapsed Time (mins) 70.00 <u> ල</u>60.00 **Ē**50.00 40.00ع **8**30.00 **=**20.00 10.00 0.00 0.76 0.75 0.73 0.74 0.77 0.78 0.79 0.80

Depth to Water (m)

f -value from field tests Soakaway Design (F2C) IGSI Contract: 22150 Contract No: 22150 Test No. TPSA03 - Cycle 2 Northing: 699153.058 Client **ARUP** Easting: 734803.725 Date: 29/10/2019 Elevation: 49.262 Summary of ground conditions from to Description Ground water 0.00 0.20 TOPSOIL: Brown slightly sandy CLAY with occasional rootlets. Seepage in MADE 0.20 0.70 MADE GROUND comprised of brownish grey slightly sandy gravelly CL GROUND at 0.5m 0.70 1.50 Firm brown mottled black sandy gravelly CLAY 1.50 1.80 Firm to stiff dark grey slightly sandy very gravelly CLAY Notes: Field Data Field Test Depth of Pit (D) Depth to Elapsed 1.80 Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.80 (m) (min) m 0.90 0.00 Initial depth to Water = 0.90 m 0.90 1.00 Final depth to water = 0.94 m 0.90 2.00 Elapsed time (mins)= 60.00 0.91 3.00 4.00 0.91 Top of permeable soil m 0.91 5.00 Base of permeable soil 0.92 10.00 15.00 0.92 0.92 20.00 0.93 25.00 0.93 0.72 30.00 Base area= m2 0.93 35.00 *Av. side area of permeable stratum over test period 3.872 m2 0.94 40.00 4.592 Total Exposed area = m2 0.94 50.00 0.94 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time 0.0001 m/min f= 1.742E-06 m/sec or Depth of water vs Elapsed Time (mins) 70.00 <u> ල</u>60.00 **Ē**50.00 40.00ع **8**30.00 **=**20.00 10.00 0.00 0.91 0.89 0.90 0.92 0.93 0.94 0.95 Depth to Water (m)

f -value from field tests Soakaway Design (F2C) IGS Contract: 22150 Contract No: 22150 Test No. TPSA04 - Cycle 1 Northing: 735091.006 Client **ARUP** Easting: 699223.709 Date: 06/11/2019 Elevation: 50.929 Summary of ground conditions Description Ground water from to 0.00 0.30 TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet Water influx at 0.30 0.90 MADE GROUND comprised of brown sandy gravelly CLAY 1.0m 0.90 2.00 MADE GROUND comprised of dark grey to black sandy very gravelly C 2.00 Firm brown mottled grey sandy gravelly CLAY One cycle carried out. Further cycles cancelled by Consulting Engineer due to influx of water Notes: Field Data Field Test Depth of Pit (D) 2.50 Depth to Elapsed Water Time Width of Pit (B) 0.40 m Length of Pit (L) 1.60 (m) (min) m 1.30 0.00 Initial depth to Water = 1.30 m 1.30 1.00 Final depth to water = 1.31 m 1.30 2.00 Elapsed time (mins)= 60.00 1.30 3.00 1.30 4.00 Top of permeable soil m 1.31 5.00 Base of permeable soil 10.00 1.31 15.00 1.31 1.31 20.00 1.31 25.00 1.31 30.00 0.64 Base area= m2 1.31 35.00 *Av. side area of permeable stratum over test period 4.78 m2 1.31 40.00 5.42 Total Exposed area = m2 1.31 50.00 1.31 60.00 Infiltration rate (f) = Volume of water used/unit exposed area / unit time f= 0 m/min 0 m/sec ór No fall in water level after 4 minutes Depth of water vs Elapsed Time (mins) 70.00 <u>e</u>60.00 **Ē**50.00 <u>E</u>40.00 **8**30.00 **=**20.00 10.00 0.00 1.30 1.30 1.30 1.30 1.31 1.31 1.31 1.31 Depth to Water (m)

RECENED. 78/07/20

PLATE T	EST REPORT SHEET (F3.1)		Applied Pressure	/Settlement Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107335 22150 - Liffey Park Technology Campus PT01 Load See Map 0.6m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Load V.Lowe	ling Test	Description of soil unde (natural soil, placed fill, Firm brown mottled gre Easting (m) Northing (m) Ground Level (mOD) Sample Ref No. N/A Depth 0.00	sub-base) y sandy gravelly CLAY 698862.771 735057.67 50.832	I G S L	PO 1 TOOS. NAME TESTIPO TESTI
		Pressure / S	ettlement			
-0.50 -2.50 -3.50 -3.50	50	100	150	200 25	0	300
-4.00		- F	ressure (kN/m2)			
-3.00 -3.50 -4.00 Gradient at 1.25 m Modulus of subgra	nm settlement intersection = 89 de reaction = 58 MPa/m applied = 0.64 as per HD 25-26/10		Pressure (kN/m2) valent CBR value in accordance with NRA	HD25-26/10	10.8 %	

PECENED. 78072

erence No. Rentract 2 st No. Peation Soth Oent Acte Diameter: 4 st Method Behnician Withorised by	ST REPORT SHEET (F 107355 12150 - Liffey Park Technolog 101 Reload 102 Map 103 Map 104 Map 105 Map 105 Map 107 Map 107 Map 107 Map 107 Map 107 Map 107 Map 107 Map 107 Map 108 Map 109	y Campus		· / Settlement	Description of (natural soil, p Firm brown m Easting (m) Northing (m) Ground Level Sample Ref No Depth	o. N/A 0.00	2)	I G S L	IV NAB INTERPORTATION OF THE PROPERTY OF THE
st No. Particular Station Softh Open Art Art Method Behnician Vectorised by	PTO1 Reload See Map 0.6m Arup 150 mm IS 1377: Part 9: 1990 Test4 - In 1.Lowe 17/11/2019	cremental Loading	Pressure		(natural soil, p Firm brown m Easting (m) Northing (m) Ground Level Sample Ref No Depth	placed fill, sub-base nottled grey sandy grey grey sandy grey grey sandy grey grey sandy grey grey sandy grey grey grey grey grey grey grey gre	698862.771 735057.67 50.832		TO THE STATE OF TH
cation Softh On the Control of the C	See Map D.6m Arup ISO mm IS 1377: Part 9: 1990 Test4 - In V.Lowe IT/11/2019		Pressure		Firm brown m Easting (m) Northing (m) Ground Level Sample Ref No Depth	(mOD) o. N/A 0.00	698862.771 735057.67 50.832		IV N AB ICHWO AR SOTT ATT STATES
oth Ö ent Ä te Diameter: 4 st Method B chnician Ü thorised by	0.6m Arup ISO mm IS 1377: Part 9: 1990 Test4 - In /Lowe IT/11/2019		Pressure		Easting (m) Northing (m) Ground Level Sample Ref No	(mOD) o. N/A 0.00	698862.771 735057.67 50.832		SOUTHER SOUTHER STATES
ent A te Diameter: 4 st Method B chnician V thorised by	Arup 150 mm IS 1377: Part 9: 1990 Test4 - In 7.Lowe 17/11/2019		Pressure		Northing (m) Ground Level Sample Ref No Depth	o. N/A 0.00	735057.67 50.832		IVAB CONTROL OF SCOT BY SEALES
te Diameter: 4 st Method B chnician V thorised by	150 mm IS 1377: Part 9: 1990 Test4 - In /Lowe 17/11/2019		Pressure		Northing (m) Ground Level Sample Ref No Depth	o. N/A 0.00	735057.67 50.832		TOTAL STANDAR SOTERIOR SOLUTION
st Method B chnician V thorised by	S 1377: Part 9: 1990 Test4 - Ind /Lowe 		Pressure		Ground Level Sample Ref No Depth	o. N/A 0.00	50.832		granda a gorgi arri saki (134)
chnician V thorised by	/.Lowe 7/11/2019		Pressure		Sample Ref No Depth	o. N/A 0.00			450
thorised by	7/11/2019	00 1			Depth	0.00	m bgl		450
	7/11/2019	00 1			'		m bgl		450
	50 10	00 1							450
	50 10	00 1	150		250				450
0	30 10	10		200		300	350	400	
0.00			130	200	230		330	+00	+30
	-								
-0.50									
:									
-1.50									
<u>.</u>					-				
-1.50	_								
, -1.30									
1		-					*		
-2.00									
2.00								_	
									
-2.50				Pressure (kl	N/m2)				
	n settlement intersection = 20)9							
	reaction = 134 MPa/m plied = 0.64 as per HD 25-26/		F	Equivalent CBR v	alue in accordanc	ce with NRA HD25-26	/10	47.0 %	

PECENED. 78075

PLATE 7	TEST REPORT SHEET (F3.1)		Applied I	Pressure/Settleme	ent Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107336 22150 - Liffey Park Technology Campus PT03 load See Map 0.95m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadi V.Lowe Hugh Byrne 07/11/2019	ing Test	(natural soil,	nOD) No. <u>N/A</u>	698715.377 734959.854 52.928 bgl	I G S L	IVNAB control (15) No. 1905 (1
0 0.00 =	50	Pressure /	Settlement 150	200	250)	300
-0.20							
-0.60 -0.80 -1.00 -1.20 -1.40		•					
-1.40 -1.60 -1.80				•			
-2.00			Pressure (kN/m2)				
odulus of subgr	mm settlement intersection = 132 ade reaction = 85 MPa/m applied = 0.64 as per HD 25-26/10	Eq	uivalent CBR value in accordar	nce with NRA HD25-26/10		21.2 %	

PROPINED. 7807/20

PLATE '	TEST REPORT SHEET (F3.1)		Applied Pr	ressure/Settlemer	nt Curve		.0
eference No.	R107336	"					
Contract	22150 - Liffey Park Technology Campus	;	Description of	soil under test			
est No.	PT03 Reload		(natural soil, p	placed fill, sub-base)			
ocation	See Map		Firm to stiff greyish br	own slightly sandy very gravelly CLAY		(ata	150 17025
epth	0.95m					(IVNAB
lient	Arup		Easting (m)		698715.377	IGSL	TESTING
ate Diameter:	450 mm		Northing (m)		734959.854	Ltd.	W SCORE HITE NO. 1331
est Method	BS 1377: Part 9: 1990 Test4 - Incremental I	Loading Test	Ground Level		52.928		
echnician	V.Lowe		Sample Ref No				
Authorised by Date	07/11/2019		Depth	0.00 m b	gl		
		Pressure / Settl	ement				
		110000107 0000	omone .				
0	50	100	150	200	250)	300
0.00	_						
-0.20							
-0.20							
-0.40							
Ē l							
5 -0.60							
-0.60 -0.80 -1.00 -1.00							
-0.80		-					
₹ -1.00							
-1.20							
-1.40		_					
-1.60		Press	sure (kN/m2)				
	mm settlement intersection = 173 rade reaction = 111 MPa/m	Equivalen	nt CBR value in accordance	th NDA LID2E 20/10		33.8 %	
Millie At cliba							

PROFILED. 7807 SO

PLATE T	TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve
Reference No. Contract Test No. Location Depth Client Test Method Technician Authorised by Date	R107337 22150 - Liffey Park Technology Campus PT04 Load See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadir V.Lowe	g Test	Description of soil under test (natural soil, placed fill, sub-base) Firm brown mottled grey sandy very gravelly CLAY Easting (m) 698808.795 Northing (m) 734863.887 Ground Level (mOD) 51.555 Sample Ref No. N/A Depth 0.00 m bgl
0.00	50	Pressure / Settle	150 200 250 300
-0.40 -0.60 -0.80 -1.20 -1.20 -1.40			
-1.60 -1.80 -2.00		Press	sure (kN/m2)
Modulus of subgra	mm settlement intersection = 119 ade reaction = 76 MPa/m applied = 0.64 as per HD 25-26/10	Equivaler	nt CBR value in accordance with NRA HD25-26/10 17.6 %

PROPINED. 7807/20

PLATE 7	TEST REPORT SHEET ((F3.1)			Applied Pr	essure/Settle	ment Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107337 22150 - Liffey Park Technolo PT04 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - V.Lowe 07/11/2019		ng Test		(natural soil, p	. <u>N/A</u>	698808.795 734863.887 51.555	I G S L	NAB NAB NAB NAB TESTAGO STAGO OF STAGO OF STAGO STAGO OF STAGO OF
0 0.00 	50 1	100	Pressure	e / Settlement	250	300	350	400	450
-0.20 -0.40 -0.60 -0.80									
-0.60 -0.80 -1.20 -1.40	•	-							
-1.60 -1.80 -2.00				Pressure (kN/	m2)				
Modulus of subgra	mm settlement intersection = 2 ade reaction = 176 MPa/m applied = 0.64 as per HD 25-2			Equivalent CBR val	ue in accordance	with NRA HD25-26/1	0	74.9 %	

PECENED. 78/07/20

PLATE 7	TEST REPORT SHEET (F3.1)		Applied Pressure	e/Settlement Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter:	R1073358 22150 - Liffey Park Technology Campus PT05 Load See Map 0.6m Arup 450 mm		Description of soil under (natural soil, placed fill, Firm brownish grey san Easting (m) Northing (m)	, sub-base)	I G S L	ISO 17025 NAB ACCOUNTED TESTING
Test Method Technician Authorised by Date	BS 1377: Part 9: 1990 Test4 - Incremental Loa S.Cunningham	ding Test	Ground Level (mOD) Sample Ref No. N/A Depth 0.00	55.965	Liu	
		Pressure / Settl	ement			
0.00	50	100	150	200 250	0	300
-1.00						
-3.00 -4.00	1	•				
-3.00			•			
-5.00	_					
-6.00		Pres	sure (kN/m2)			
dulus of subgr	mm settlement intersection = 50 rade reaction = 32 MPa/m rapplied = 0.64 as per HD 25-26/10	Equivale	nt CBR value in accordance with NRA	A HD25-26/10	4.0 %	

PECENED. 7807/20

PLATE '	TEST REPORT SHEE	T (F3.1)		Ar	plied Pressu	re/Settlem	ent Curve		.0
eference No.	R107338				•				
Contract	22150 - Liffey Park Ted	chnology Campus		Des	cription of soil un	der test			
est No.	PT05 Reload				tural soil, placed f				
ocation	See Map			Firr	n brownish grey sa	andy very grave	elly CLAY	(ala)	150 17025
epth	0.6m								IVNAB
lient	Arup				ting (m)		698522.695	I G S L	TESTING
late Diameter:	450 mm				thing (m)		734945.924	Ltd.	GETAILED IN SCORE HITE NO. 1231
est Method	BS 1377: Part 9: 1990 Te	est4 - Incremental Lo	pading Test		und Level (mOD)		55.965		
echnician	S.Cunningham				nple Ref No. N/				
uthorised by	4 Ryan			Dep	oth <u>0.0</u>	00 n	n bgl		
ate	04/11/2019								
0	50	100		Settlement 200	250	300	350	400	450
0.00									
-0.50									
-1.00									
E 150									
5 -1.50 달			1						
2.00 −					-				
-2.50 -2.50 -2.50				1					
ري -3.00									
	_								
-3.50	•					_		──	
-3.50				Pressure (kN/m2)			———	
		-		Pressure (kN/m2)				
-3.50 -4.00	mm settlement intersection adde reaction = 65 MPa/m			· • • • • • • • • • • • • • • • • • • •) accordance with N			13.2 %	

PROFILED. 7807 SO

PLATE 1	TEST REPORT SHEET (F3.1)	Applied Pressure/Settlement Curve	***
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R107339 22150 - Liffey Park Technology Campus PT06 Load See Map 0.6m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadir V.Lowe 01/11/2019	Description of soil under test (natural soil, placed fill, sub-base) Firm light brown mottled grey sandy gravelly CLAY Easting (m) 698561.485 Northing (m) 734805.081 Ground Level (mOD) 54.489 Sample Ref No. N/A Depth 0.00 m bgl	I NAB NAB NOBELE STREET STAND AS STORY ASSESSED.
0 0.00	50	Pressure / Settlement 100 150 200 250	300
-0.60 -0.80 -1.00 -1.20 -1.40			
-1.60 -1.80 -2.00		Pressure (kN/m2)	
Modulus of subgra	mm settlement intersection = 115 ade reaction = 74 MPa/m applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10 16.7 %	

PLATE 1	TEST REPORT SHEET (F3.1)		Applied Pressure/Se	ettlement Curve		.0
Reference No. Contract Fest No. Location Depth Client Plate Diameter:	R107339 22150 - Liffey Park Technology Campus PT06 Reload See Map 0.6m Arup 450 mm		Description of soil under tes (natural soil, placed fill, sub- Firm light brown mottled gre Easting (m) Northing (m)	t base) ey sandy gravelly CLAY 698561.485 734805.081	I G S L	IV NOT THE STATE OF THE STATE O
Test Method Technician Authorised by Date	BS 1377: Part 9: 1990 Test4 - Incremental Load V.Lowe 01/11/2019	ding Test	Ground Level (mOD) Sample Ref No. N/A Depth 0.00	54.489 m bgl		
		Pressure / Sett	lement			
0.00	50 100	150	200 250	300	350	400
-0.40 -0.60 -0.80 -0.80						
-1.20		-				
-1.40		Pres	sure (kN/m2)			I
lodulus of subgra	mm settlement intersection = 294 ade reaction = 189 MPa/m applied = 0.64 as per HD 25-26/10	Equivale	nt CBR value in accordance with NRA HD2	5-26/10	84.8 %	

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PLATE	TEST REPORT SHEET (F3.1)		Applied Pressure/Set	tlement Curve		.0
eference No.	R107340					
Contract	22150 - Liffey Park Technology Campus		Description of soil under test			
est No.	PT07 Load		(natural soil, placed fill, sub-ba			
ocation	See Map		Brown mottled grey sandy gra	velly CLAY		150 1707
epth	0.5m				(<u>₹</u> • • • • • • • • • • • • • • • • • • •	IVNAB
lient	Arup		Easting (m)	698495.699	IGSL	TESTING
late Diameter:	450 mm		Northing (m)	734757.261	IGSL	QETAILER IN SCORE HITS NO. 1231
est Method	BS 1377: Part 9: 1990 Test4 - Incremental Lo	ading Test	Ground Level (mOD)	54.554		
echnician	S.Cunningham		Sample Ref No. N/A			
uthorised by	4 Byon		Depth <u>0.00</u>	m bgl		
ate	04/11/2019					
0	50	Pressure / Settl	150 200	250)	300
0.00						
-0.50						
E						
<u>E</u> _1.00						
ੂ ^{-1.00} ਜ						
-1.00 -1.50 -1.50 -1.50						
ቜ -1.50 ├──						
Š 💺			•			
]						
-2.00						
		_				
-2.50	_	Pres	sure (kN/m2)			
-2.30	·			·		
adient at 1 25	mm settlement intersection = 103					
	rade reaction = 66 MPa/m	Equivale	nt CBR value in accordance with NRA HD25-2	26/10	13.8 %	
	applied = 0.64 as per HD 25-26/10	Equitare				

PECENED. 7807/20

PLATE 7	TEST REPORT SHEET	(F3.1)		,	Applied Pr	essure/Settle	ment Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R1073341 22150 - Liffey Park Technol PT07 Reload See Map 0.5m Arup 450 BS 1377: Part 9: 1990 Test4 - S.Cunningham 04/11/2019		g Test	(<u>)</u> E E N (<u>)</u> S	natural soil, p		y CLAY 698495.699 734757.261 54.554	I G S L	BO I YOUR IN A COUNTY OF THE PARTY OF T
0 0.00 -0.20 -0.40	50	100	Pressure	e / Settlement	250	300	350	400	450
-0.60 -0.80 -1.20 -1.20 -1.40 -1.20 -1.40					-				
	mm settlement intersection = ade reaction = 141 MPa/m	219		Pressure (kN/r		e with NRA HD25-26/	10	51.1 %	

PROPINED. 780720

PLATE 7	TEST REPORT SHEET (F3.1)		Applied Pres	sure/Settlem	ent Curve		.0
eference No.	R107341						
Contract	22150 - Liffey Park Technology Campus		Description of soi				
est No.	PT09 Load		(natural soil, place				
ocation	See Map		Firm to stiff light	brown mottled gre	ey sandy gravelly CL	AY	150 17025
)epth	0.5m					(L	IVNAB
Client	Arup		Easting (m)		698835.693	IGSL	TESTING
Plate Diameter:	450 mm		Northing (m)		734298.251	Ltd.	W SCORE HILL NO. 133
est Method	BS 1377: Part 9: 1990 Test4 - Incremental Loadin	ng Test	Ground Level (mC		51.023		
echnician	V.Lowe			N/A			
Authorised by Date	US/11/2019		Depth	0.00 r	n bgl		
		Pressure / Sett	lement				
0	50	100	150	200	250		300
0.00	_						
-0.20	~						
-0.20							
-0.40							
E -0.60	•						
E	1						
-0.80							
필 -1.00 		`\.					
± -1.20 -1.20							
1.20							
· -1.40							
-1.60			-				
-1.80		_					
-2.00		Pres	sure (kN/m2)		-		
-2.00	mm settlement intersection = 98	Pres	sure (kN/m2)				
	rade reaction = 63 MPa/m	Equivale	nt CBR value in accordance wit	th NRA HD25-26/10	1	12.7 %	
	applied = 0.64 as per HD 25-26/10						

PECENED. 78/07/20

PLATE 1	TEST REPORT SHEET (F3	.1)			Applied Pro	essure/Settlem	ent Curve		.0
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R1073341 22150 - Liffey Park Technology PT09 Reload See Map 0.5m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incre V.Lowe 05/11/2019		t		Description of (natural soil, pl from to stiff light brown mottled gre Easting (m) Northing (m) Ground Level (Sample Ref No. Depth	aced fill, sub-base) y sandy gravelly CLAY mOD) N/A	698835.693 734298.251 51.023	I G S L	IVA ABOUTS
0 0.00	50 100	150		' Settlement	250	300	350	400	450
-0.40 -0.60 -0.80 -1.20									
-1.40 -1.60 -1.80				Pressure (kN/	/m2)				
Modulus of subgr	mm settlement intersection = 270 ade reaction = 174 MPa/m applied = 0.64 as per HD 25-26/1		Ec	juivalent CBR val	ue in accordance	with NRA HD25-26/10		73.3 %	

PROPINED. 7807/20

PLATE ⁻	TEST REPORT SHEET (F3.1)		Applied Pres	sure/Settleme	ent Curve		.0
eference No. Contract Test No. Cocation Depth Client Clate Diameter: Test Method Technician Suthorised by Date	R107342 22150 - Liffey Park Technology Campus PT10 Load See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loadi S.Cunningham	ng Test		ed fill, sub-base) gravelly CLAY	699053.493 734505.499 48.577 bgl	I G S L	IVAB NAB NOVEMBER NATIONAL STATE OF THE PARTY AND THE PART
0	50	Pressure / S	Settlement 150	200	250)	300
-0.50							
-2.50 -2.50 -3.00 -3.00							
-2.50 -3.00 -3.00							
-3.50	•	-					
-4.50			Pressure (kN/m2)				
odulus of subgr	mm settlement intersection = 74 rade reaction = 47 MPa/m rapplied = 0.64 as per HD 25-26/10	Equi	ivalent CBR value in accordance wit	th NRA HD25-26/10		7.7 %	

PECENED. 78/07/20

TEST REPORT	SHEET (F3.	1)			Applied Pr	essure/Settlen	nent Curve		.0
PT10 Reload See Map 0.4m Arup 450 BS 1377: Part 9: S.Cunningham	mm 1990 Test4 - Incren		Test		(natural soil, p Firm brown sai Easting (m) Northing (m) Ground Level (laced fill, sub-base) ndy gravelly CLAY (mOD) o. N/A	699053.493 734505.499 48.577 m bgl	I G S L	TWA NOT THE PROPERTY OF THE PR
			Pressu	re / Settlement			·		
50	100		150	200	250	300	350	400	450
				-					
				Pressure (kh	/m2)				
	22150 - Liffey F PT10 Reload See Map 0.4m Arup 450 BS 1377: Part 9: S.Cunningham	22150 - Liffey Park Technology C PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Increr S.Cunningham	22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading S.Cunningham	22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test S.Cunningham 31/10/2019 Pressu	22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test S.Cunningham 31/10/2019 Pressure / Settlement	22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test S.Cunningham 31/10/2019 Pressure / Settlement	22150 - Liffey Park Technology Campus PT10 Reload See Map 0.4m Arup 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test S.Cunningham 31/10/2019 Pressure / Settlement Description of soil under test (natural soil, placed fill, sub-base) Firm brown sandy gravelly CLAY Easting (m) Northing (m) Ground Level (mOD) Sample Ref No. N/A Depth 0.00	Description of soil under test (natural soil, placed fill, sub-base)	Description of soil under test (natural soil, placed fill, sub-base)



REPORT NUMBER

CON	TRACT	Liffey Park Technology Camp	ous					TRIAL, P	IT NO.	TP0 Shee	1 et 1 of 1	_
LOG	GED BY	Victoria Lowe	CO-ORDINAT		735,05	62.77 E 57.67 N		DATE ST	TARTED OMPLETE		1/2019 1/2019	
CLIEI	NT NEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	50.83			EXCAVA METHOD		JCB	8T	
									Samples	5	a) a)	neter
		Geotechnical Descript	ion	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer
0.0	MADE (GROUND: TARMACADAM GROUND comprised of medium clayey GRAVEL. Sand is mediur	m to fine. Gravel is		0.10	50.73						
-	MADE	ular to subrounded, fine to med GROUND comprised of medium GRAVEL. Sand is fine to mediur	n dense dark grey		0.40	50.43						
\	Geome Firm bro	ular, fine to medium. mbrane own mottled grey sandy gravelly content. Sand is fine to medium	/ CLAY with a high		0.55	50.28		AA123646	В	0.50		
1.0	subang subang Geome		subrounded to		4.00	40.50		AA123647	В	1.10		
	with a n content Sand is coarse. rounded	ey mottled black slightly sandy vertiled black slightly sandy vertiled to medium cobble content and a mean with occasional very large bout fine to medium. Gravel is subated to angulated to subrounded. Trial Pit at 1.50m	edium boulder lders >600mm. ngular, fine to		1.30	49.53 49.33	(Rapid)	AA123648	В	1.40		
2.0												
3.0												
	ndwater inflow at	Conditions 1.5mbgl										<u> </u>
Stabi Unsta	lity able at 1.	4mbgl										
Gene	ral Rema	arks										



REPORT NUMBER

/10	33L/								22	150	
CON	NTRACT Liffey Park Technology Campus	1					TRIAL, PI	IT NO.	TP0	2 et 1 of 1	
LOG	GGED BY Victoria Lowe	CO-ORDINATI	ORDINATES 698,897.79 E 734,973.03 N				DATE ST		D 31/10/2019		
CLIE	ENT O' Flynn Group	GROUND LEV	/EL (m)	50.03			<u> </u>			JCB 8T	
	·	1						Samples	120))	neter
	Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL: Brown slightly sandy clay with oc and rootlets. MADE GROUND comprised of medium den sandy clayey GRAVEL. Sand is medium to f subangular to subrounded, fine to medium. Firm to stiff dark brown mottled grey slightly gravelly CLAY with a low cobble content and boulders. Sand is fine to medium. Gravel is to subangular, fine to coarse. Cobbles are subangular. Boulders are rounded to subrou Stiff black slightly sandy gravelly CLAY with and medium boulder content. Sand is fine to Gravel is subrounded to subangular, fine to Cobbles are subrounded to subangular. Bou rounded to subrounded.	se black ine. Gravel is sandy d occasional subrounded ubrounded to unded. a high cobble o coarse. coarse.		0.30 0.40 0.55	49.73 49.63 49.48		AA118621 AA118622 AA118623		0.15 0.70 0.70		
- 2.0 - 2.0 	End of Trial Pit at 1.70m	 0	1.70	48.33		AA118624 AA118625	B B	1.70			
Gro u	undwater Conditions										
Stab Stab											
Gen	eral Remarks										



REPORT NUMBER

CON	TRACT	Liffey Park Technology Camp	ous					TRIAL PIT NO. TP03 SHEET Sheet 1 of 1					
LOG	GED BY	Sean Cunningham	CO-ORDINAT		734,9	15.38 E 59.85 N		DATE S	TARTED OMPLETE	01/1	1/2019 1/2019		
CLIE	NT INEER	O' Flynn Group Arup	GROUND LEV	VEL (m) 52.93				EXCAVATION JCB 8T METHOD					
									Samples	1	ال الم	neter	
		Geotechnical Descript	ion	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
0.0		GROUND: TARMACADAM GROUND comprised of a comp	act light grev		0.10	52.83							
-	clayey s	sandy GRAVEL. Sand is fine to ular to subrounded, fine to med	coarse. Gravel is		0.25	52.68		AA108753	В	0.20			
-	MADE (sandy c subang	GROUND comprised of mediun layey GRAVEL. Sand is mediun ular to subrounded, fine to med	m to fine. Gravel is ium. /		0.50	52.43		AA108754	В	0.40			
-	rounded Firm to	GROUND comprised of coarse diclayey GRAVEL. stiff greyish brown slightly sand	y very gravelly		0.85	52.08		AA108755	В	0.70			
- 1.0 	CLAY wand occidence occide	rith a high cobble and a mediun asional large boulders. Sand is s subangular to subrounded, fii s are subrounded to subangula d to subrounded.	n boulder content fine to medium. ne to coarse.		2.50	50.43		AA108756		2.30			
Dry Stab	ility												
Sligh		ole in made ground.											
Gene	eral Rema	rks											



REPORT NUMBER

CON	TRACT	Liffey Park Technology Campus						TRIAL, P	IT NO.	TP0	4 et 1 of 1		
LOG	GED BY	Victoria Lowe	CO-ORDINAT	ES		08.80 E 63.89 N		DATE S	TARTED OMPLETE		1/2019 1/2019		
CLIE	NT NEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	51.56			EXCAVATION JCB 8T METHOD					
									Samples	5	ay ay	neter	
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)	
0.0		GROUND: TARMACADAM	ana blank		0.10	51.46							
-	sandy c subangı	GROUND comprised of medium der layey GRAVEL. Sand is medium to ular to subrounded, fine to medium.	fine. Gravel is		0.30	51.26		AA123642	? В	0.20			
-	cobble a Gravel i subroun subroun		ine to medium. de is						_				
-	Geomer	mbrane			0.90	50.66		AA123643	8 B	0.70			
1.0	with a m content. fine to c	ey mottled black slightly sandy very predium cobble content and a mediu. Sand is fine to medium. Gravel is spoarse. Cobbles are rounded to anguald to a subspirate of the company of the c	m boulder subangular,		0.90	30.00							
-	are rour	nded to subrounded.						AA123644	В	1.20			
- - -	and med Gravel i	ck sandy very gravelly CLAY with a dium boulder content. Sand is fine t s subangular, fine to coarse. Cobblelar. Boulders are rounded to subrou	o medium. es are rounded		1.60	49.96 49.76	,	AA123645	5 В	1.70			
2.0		Γrial Pit at 1.80m											
- - - 3.0													
- -													
	ındwater (Conditions				<u> </u>							
Stabi Sligh		ole to 0.3m. Stable below											
Gan	-												
Gene	eral Rema	IRS											
Stabi Sligh Gene													



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Campus	1						TRIM, PIT NO. SHEET					
LOG	GED BY	Sean Cunningham	CO-ORDINAT		734,9	22.70 E 45.92 N		DATE S	TARTED OMPLETE	04/1	et 1 of 1 1/2019 1/2019			
CLIE	NT INEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	55.97			EXCAVATION JCB 8T METHOD						
									Samples	₹	Se Se	meter		
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)		
0.0	TOPSO and roo	IL: Brown slightly sandy clay with octlets.	casional roots		0.25	FF 70								
-	SUBSO	IL: Brown sandy gravelly CLAY.				55.72								
1.0	Sand is	Firm to stiff brownish grey sandy very gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium.			0.60	55.37								
-	Firm to	stiff brownish grev sandy very grave	llv CL AY with		1.70	54.27		AA116285	В	1.10				
2.0	medium subrour	stiff brownish grey sandy very grave Band is fine to coarse. Gravel is suded, fine to medium.	ibangular to				(Seepage)	AA116286	з В	2.20				
-	End of	Frial Pit at 2.60m		<u> </u>	2.60	53.37								
3.0														
Grou Grou		Conditions at 2.1mbgl												
Stab	ility													
Sligh	itly unstab													
Gene	eral Rema	rks												



REPORT NUMBER

CON	TRACT	Liffey Park Technology Cam	npus					TRIAL, P	IT NO.	TP0 Shee	6 et 1 of 1	
LOG	GED BY	Victoria Lowe	CO-ORDINAT		698,50 734,80	61.49 E 05.08 N		DATE S	TARTED OMPLETE		1/2019 1/2019	
CLIE	NT INEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	54.49			EXCAVA METHOI		JCB:	8T	
									Samples	3	ار ال	meter
		Geotechnical Descrip	otion	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	GRAVE subroun	GROUND comprised of loose L. Sand is medium to fine. Graded, fine to medium.	avel is subangular to		0.25	54.24		AA108758	В	0.20		
-	fine to c coarse.	GROUND comprised of sandy oarse. Gravel is subangular to onto the brown mottled grey sandy g	subrounded, fine to	<u></u>	0.55	53.94		AA108759	В	0.40		
- - - 1.0	nigh cot subangi subangi	oble content. Sand is fine to mular, fine to medium. Cobble is ular.	ledium. Gravel is a subrounded to					AA103760 AA108760		0.80 0.80		
- - - -	cobble a	stiff black slightly sandy grave and boulder content <350mm. . Gravel is subangular, fine to ded to subangular. Boulders a ded.	Sand is fine to medium. Cobble is		1.40	53.09 52.59		AA103761 AA108761	B B	1.70 1.70		
2.0	End of 1	Frial Pit at 1.90m			1.50	32.33						
3.0												
Grou Seep		Conditions ade ground		1	I	ı		<u> </u>				
Stab Unst		ade ground. Stable below.										
Stab Unst	eral Rema	rks										



REPORT NUMBER

CON	TRACT	Liffey Park Technology Camp						TRIAL, PI SHEET		TP0	7 t 1 of 1	
LOG	GED BY	Sean Cunningham	CO-ORDINAT		734,7	95.70 E 57.26 N		DATE ST	ARTED		1/2019 1/2019	
CLIE ENGI	NT NEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	54.55			EXCAVA METHOD	ATION /	JCB:	8T	
								:	Samples	· ~))	neter
		Geotechnical Description	on	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	sandy c subang	GROUND comprised of medium layey GRAVEL. Sand is mediun ular to subrounded, fine to medi	n to fine. Gravel is um.		0.30	54.25		AA116287	В	0.20		
	Firm bro	GROUND comprised of subroun GRAVEL. own mottled grey sandy gravelly and a low boulder content. Sand is subangular, fine to medium. Onded to subangular. Boulders are	CLAY with a high I is fine to medium.		0.40	54.15		AA116288	В	0.40		
- - 1.0 - -	subrour	naea.						AA116289	В	1.00		
2.0 - - - - - -	End of ⁻	Trial Pit at 1.60m		<u></u>	1.60	52.95						
3.0												
Grou Dry	ndwater	Conditions										<u> </u>
Stabi Unsta		ade ground.										
Gene	eral Rema	arks										



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Camp	us					TRIAL PIT NO. TP08 SHEET Sheet 1 of 1				
LOG	OGGED BY Sean Cunningham		CO-ORDINAT		734,5	57.13 E 28.32 N		DATE S	TARTED OMPLETE	05/1	1/2019 1/2019	
CLIE ENGI	NT INEER	O' Flynn Group Arup	GROUND LEV	/EL (M)	54.11			EXCAV/ METHO		JCB	8T	
									Samples	· ~	S) Se	neter
		Geotechnical Descripti	on	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	and roof	ROLIND comprised of brown s	andy gravelly	*	0.25	53.86						
-	CLAY with occasional plastic and iron pipes, red bricks and plastic fragments. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.) ר; ×Q; > Ø; > Ø;				AA116273	8 B	0.50		
1.0 - - -				[xð x x x x x x x x x x x x x x x x x x			(Moderate)	AA116274	В	1.00		
- - - - 2.0	Firm to : CLAY w	stiff brown mottled grey slightly ith medium cobble and boulder	sandy gravelly content		1.50	52.61		AA116276 AA116276	B B	1.50 1.50		
-	a high c medium	stiff brown mottled grey sandy g obble and a low boulder conten . Gravel is subangular, fine to n	t. Sand is fine to nedium. Cobble is		2.30	51.81		AA116277 AA116278	В В В	2.30 2.30		
-	subroun	nded to subangular. Boulders ar nded. Frial Pit at 2.60m	e rounded to		2.60	51.51						
3.0 - -												
		Conditions age at 1.2m		1		ı	1	ı			ı	
Stabi Stabi												
Stabi Stabi	eral Rema	rks										



REPORT NUMBER

22150

TRIAL PIT NO. **TP09** CONTRACT Liffey Park Technology Campus SHEET Sheet 1 of 1 **CO-ORDINATES** 698,835.69 E DATE STARTED 05/11/2019 **LOGGED BY** Victoria Lowe 734,298.25 N DATE COMPLETED 05/11/2019 GROUND LEVEL (m) 51.02 **EXCAVATION** JCB 8T **CLIENT** O' Flynn Group **METHOD ENGINEER** Arup Hand Penetrometer (KPa) Samples /ane Test (KPa Water Strike Geotechnical Description Elevation Sample Ref Legend Depth (m) Depth Type 711. 111 TOPSOIL: Brown slightly sandy clay with occasional roots and rootlets. 1/ 1/1/ 1 0.20 50.82 <u>-</u> SUBSOIL: Brown sandy gravelly CLAY. ō 0.45 50.57 Firm to stiff light brown mottled grey sandy gravelly CLAY with a medium cobble and a low boulder content. Sand is fine to medium. Gravel is subangular, fine to medium. 0 Cobble is subrounded to subangular. Boulders are AA116279 0.70 В rounded to subrounded. ō AA116280 0.70 _-__ 1.0 ___ (Rapid) 2.0 AA116281 2.00 2.00 ВВ AA116282 2.40 48.62 Stiff dark grey to black sandy very gravelly CLAY with a medium cobble and boulder content. Sand is fine to ____ AA116283 2.50 В medium. Gravel is subangular, fine to medium. Cobble is AA116284 2.50 <u>---</u> subrounded to subangular. Boulders are rounded to 2.70 48.32 subrounded. End of Trial Pit at 2.70m 3.0 **Groundwater Conditions** 25/11/19 Medium seepage at 1.1m. Fast inflow at 1.3m

Stability

IGSL.GDT

22150.GPJ

IGSL TP LOG

Unstable at 1.1m



REPORT NUMBER

22150

TRIAL PIT NO. **TP10** CONTRACT Liffey Park Technology Campus SHEET Sheet 1 of 1 **CO-ORDINATES** 699,053.49 E DATE STARTED 29/10/2019 **LOGGED BY** Sean Cunningham 734,505.50 N DATE COMPLETED 29/10/2019 GROUND LEVEL (m) 48.58 **EXCAVATION** JCB 8T CLIENT O' Flynn Group **METHOD ENGINEER** Arup Hand Penetrometer (KPa) Samples /ane Test (KPa) Nater Strike Geotechnical Description Elevation Sample Ref Depth (m) Type MADE GROUND comprised of dark grey sandy GRAVEL with a low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is 0.25 AA118605 В 0.20 48.33 subrounded to subrounded. SUBSOIL: Light grey sandy CLAY. 0.35 48.23 Firm brown mottled grey sandy gravelly CLAY with low 0.45 48.13 cobble content and occasional boulders <450mm. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular. Boulders are rounded to subrounded. Firm greyish brown sandy gravelly CLAY with a medium cobble content and occasional boulders. Sand is fine to AA118606 В 0.80 coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders 1.0 are rounded to subrounded. 1.45 47.13 Firm to stiff brown sandy gravelly CLAY with a medium cobble and low boulder content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. AA118607 1.60 Cobble is subrounded to subangular. Boulders are rounded to subrounded. 2.0 -nage) AA118608 2.60 В 2.70 45.88 End of Trial Pit at 2.70m 3.0 **Groundwater Conditions** 25/11/19 Moist at 2.5m. Seepage at 2.6m.

Stability

IGSL.GDT

22150.GPJ

IGSL TP LOG

Slightly unstable to 0.25m. Stable after 0.25m



REPORT NUMBER

22150

TRIAL PIT NO. **TP11** CONTRACT Liffey Park Technology Campus SHEET Sheet 1 of 1 **CO-ORDINATES** 699.023.51 E DATE STARTED 31/10/2019 **LOGGED BY** Sean Cunningham 734,676.58 N DATE COMPLETED 31/10/2019 **GROUND LEVEL (m)** 50.00 **EXCAVATION** JCB 8T CLIENT O' Flynn Group **METHOD ENGINEER** Arup Hand Penetrometer (KPa) Samples /ane Test (KPa) Nater Strike Geotechnical Description Elevation Sample Ref Legend Depth (m) Depth Type 711. 111 TOPSOIL: Brown slightly sandy CLAY 1/ 1/1/ 0.25 49.75 MADE GROUND comprised of dark grey to black sandy gravelly CLAY with a low cobble content and boulder ר content (<500mm) with occasional plastic wire, wood fragments, breeze blocks and large pieces of polystyrene. AA118614 В 0.50 (Reworked black boulder CLAY) ×Q ר ר ר ×Q 1.0 .×Q .×Q AA118615 В 1.00 (Q, y,), Q , Q , y Reinforced concrete and polystyrene ×Õ 1.50 48.50 MADE GROUND comprised of loose to medium dense AA118616 В 1.50 clayey very gravelly SAND with occasional polystyrene fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium. 2.0 2.10 47.90 Stiff black sandy gravelly CLAY with a medium cobble and boulders content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded. AA118617 2.60 В AA118618 2.60 3.0 3.20 46.80 End of Trial Pit at 3.20m AA118619 3.20 В Ē 3.20 AA118620 **Groundwater Conditions** 25/11/19 Dry

Stability

GDT.

50.GPJ

221

IGSL TP LOG

Very unstable at 1.1m

General Remarks

Reinforced concrete and polystyrene at 1.3m



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Camp	ous					TRIAL PIT NO. TPSA01 SHEET Sheet 1 of 1				
LOG	GED BY	Sean Cunningham	CO-ORDINAT		735,1	16.40 E 56.12 N		DATE S	TARTED OMPLETE	06/1	1/2019 1/2019	
CLIE	NT INEER	O' Flynn Group Arup	GROUND LE	VEL (m)	56.20			EXCAV/ METHO		JCB	8T	
									Samples	₹	S) Se	meter
		Geotechnical Descript	ion	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSO roots an	IL: Brown slightly sandy CLAY d rootlets.	with occasional	1/ 2/1/ 7/								
-	SUBSO	IL: Brown sandy gravelly CLAY		0	0.25	55.95						
- - - -	Firm brown mottled grey mottled black sandy gravelly CLAY with a medium cobble and a low boulder content. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular. Boulders are rounded to subrounded.				0.40	55.80		AA128606	В	0.50		
1.0								AA128607	В	1.00		
2.0	fine to n Cobble rounded	stiff dark grey mottled black sai hedium cobble and a low bould hedium. Gravel is subangular, f is subrounded to subangular. E I to subrounded.	ar, fine to medium.			53.75		AA128608 AA128609		2.00		
3.0												
Grou Dry Stab Stab	I Indwater (Conditions			I	I		l	l		I	
Stab Stab												
Gene	eral Rema	rks										
!												



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Campus	3					TRIAL, P	IT NO.	TPS Shee		
LOG	DGGED BY Sean Cunningham LIENT O' Flynn Group NGINEER Arup		CO-ORDINAT		734,5	54.61 E 65.04 N		DATE S	DATE STARTED DATE COMPLETE		0/2019 0/2019	
		O' Flynn Group Arup	GROUND LEV	/EL (m)	51.86			EXCAVA METHOI	JCB	JCB 8T		
									Samples	1	a)	neter
		Geotechnical Description	1	Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL: Brown slightly sandy gravelly CLAY MADE GROUND comprised of grey brown sandy gravelly CLAY with occasional concrete fragments. Sand is fine to medium. Gravel is subangular, fine to coarse. Firm grey slightly sandy slightly gravelly CLAY. Sand is			0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 ×	0.30	51.56	₹ (Seepage)	AA118609	В	0.60		
- - - -	Firm to s	oarse. Gravel is subangular to su stiff brown mottled grey slightly sa ith a medium cobble content and s <500mm. Sand is fine to coarse	htly gravelly CLAY. Sand is pangular to subrounded. If ey slightly sandy gravelly exponent and occasional fine to coarse. Gravel is fine to coarse. Cobble is		1.20	50.66		AA118610	В	1.30		
2.0	subroun subroun	ded to subangular. Boulders are						AA118611 AA118612	В	2.60		
- - 3.0 - -	End of 1	Frial Pit at 2.90m			2.90	48.96						
	age at 1.0	Conditions Om and 1.2m										
Gene	eral Rema	rks										



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Campus						TRIAL, P	IT NO.		6A03 et 1 of 1	
LOG	GED BY	Sean Cunningham	CO-ORDINAT		734,8	53.06 E 03.73 N		DATE STARTED 29/10/2019 DATE COMPLETED 29/10/2019				
CLIE ENGI	NT NEER	O' Flynn Group Arup	GROUND LEV	/EL (m)	49.26			EXCAVATION JCB 8T METHOD				
									Samples	1))e	neter
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSO rootlets.	IL: Brown slightly sandy CLAY with o	occasional	* O * O	0.00	40.00						
	sandy g fragmen subroun	GROUND comprised of brownish gravelly CLAY with rare plastic and wits. Sand is fine to coarse. Gravel is ded, fine to coarse. Cobble is subroular. Boulders are rounded to subroular.	ic and wood Gravel is subangular to is subrounded to o subrounded.		0.20	49.06	(Seepage)	AA118601	В	0.30		
1.0	medium <450mn subroun	own mottled black sandy gravelly CL cobble content and occasional bou n. Sand is fine to coarse. Gravel is s ded, fine to coarse. Cobble is subroular. Boulders are rounded to subrou	lders subangular to ounded to		0.60	48.66		AA118602	! В	0.80		
- 2.0	with a m Sand is subroun	stiff dark grey slightly sandy very gra ledium cobble content and occasior fine to coarse. Gravel is subangular ded, fine to coarse. Cobble is subroular. Boulders are rounded to subrou	nal boulders. r to ounded to		1.50	47.76		AA118603	3 B	1.70		
	End of 1	rial Pit at 2.90m			2.90	46.36		AA118604	. В	2.80		
	age at 0.	Conditions 5m										
Gene	eral Rema	rks										



REPORT NUMBER

22150

CON	TRACT	Liffey Park Technology Campus						TRIAL, P SHEET	IT NO.		SA04 et 1 of 1				
LOG	GED BY	Victoria Lowe	CO-ORDINAT		735,0	23.71 E 91.01 N		DATE STARTED 06/11/2019 DATE COMPLETED 06/11/2019							
CLIE	NT INEER	O' Flynn Group Arup	GROUND LEV	/EL (M)	50.93			EXCAVA METHOI		JCB	8T				
									Samples	· ~	a) a)	meter			
		Geotechnical Description		Legend	Depth (m)	Elevation	Water Strike	Sample Ref	Туре	Depth	Vane Test (KPa)	Hand Penetrometer (KPa)			
0.0		IL: Brown slightly sandy CLAY with d rootlets.	occasional	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				AA128601	В	0.20					
- - - -	MADE GROUND comprised of brown sandy gravelly CLAY with geomembrane and occasional brick fragments. Sand is fine to coarse. Gravel is subangular subrounded, fine to coarse. MADE GROUND comprised of dark grey to black sandy		rick	* % % % % % % % % % % % % % % % % % % %	0.30	50.63		AA128602		0.60					
- - - - - -	very gra	GROUND comprised of dark grey to velly CLAY with a medium cobble a with concrete and plastic fragments bulder CLAY)	black sandy and boulder s. (Reworked	*	0.90	50.03	(Seepage)	AA128603	В	1.40					
2.0	cobble of fine to m	own mottled grey sandy gravelly CL content and occasional boulders <4 nedium. Gravel is subangular, fine t is subrounded to subangular. Bould to subrounded.	50mm. Sand is o medium.		1.90	49.03		AA128604	В	2.20					
- - -	content coarse. coarse.	ck sandy gravelly CLAY with a medi and a medium boulder content. Sa Gravel is subangular to subrounder Cobble is subrounded to subangulanded to subrounded.	nd is fine to d, fine to		2.70	48.43		AA128605	В	2.60					
3.0	End of T	Frial Pit at 2.70m													
	indwater (page at 0.9	Conditions 9m													
Stab Stab															
Gene	eral Rema	rks													