

RECEIVED: 18/07/2023

Appendix 4
Infiltration Test Records

Soakaway Design f -value from field tests (F2C) IGSL

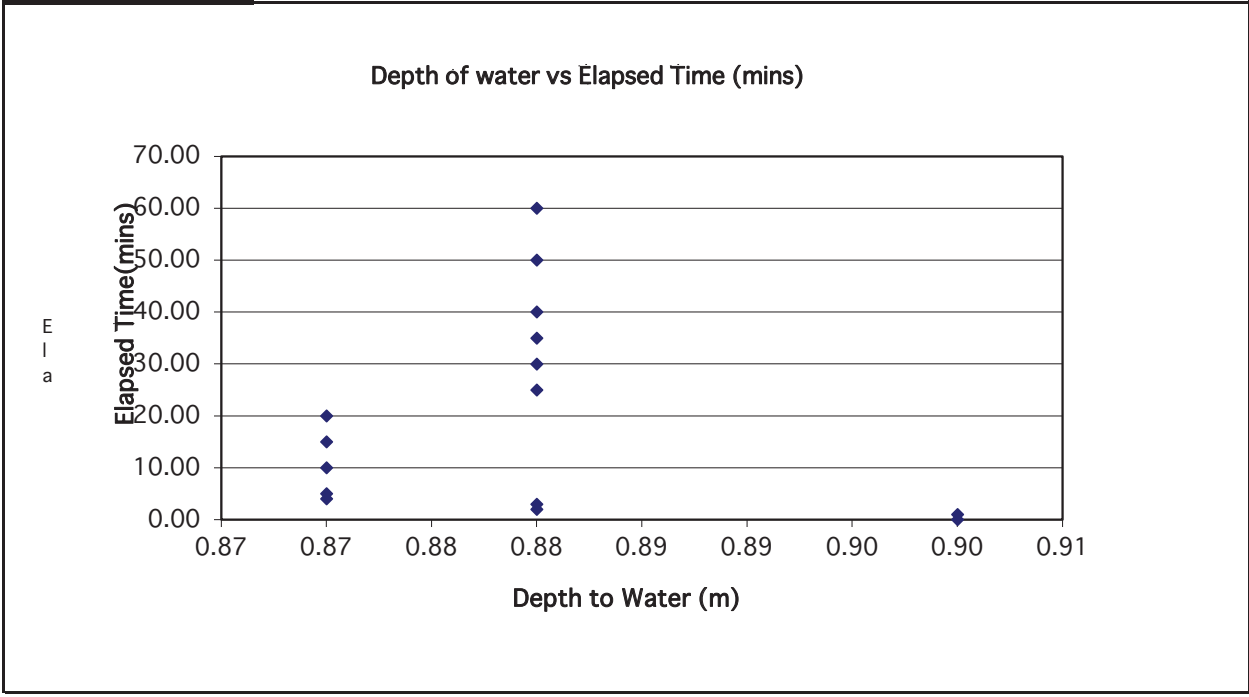
Contract: 22150	Contract No: 22150
Test No. TPSA01	Northing: 735156.119
Client ARUP	Easting: 698516.401
Date: 06/11/2019	Elevation: 56.203

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet	None observed
0.25	0.40	SUBSOIL: Brown sandy gravelly CLAY.	
0.40	1.50	Firm brown mottled grey mottled black sandy gravelly CLAY	
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																																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Depth to Water (m)</th> <th style="width: 50%;">Elapsed Time (min)</th> </tr> </thead> <tbody> <tr><td>0.90</td><td>0.00</td></tr> <tr><td>0.90</td><td>1.00</td></tr> <tr><td>0.88</td><td>2.00</td></tr> <tr><td>0.88</td><td>3.00</td></tr> <tr><td>0.87</td><td>4.00</td></tr> <tr><td>0.87</td><td>5.00</td></tr> <tr><td>0.87</td><td>10.00</td></tr> <tr><td>0.87</td><td>15.00</td></tr> <tr><td>0.87</td><td>20.00</td></tr> <tr><td>0.88</td><td>25.00</td></tr> <tr><td>0.88</td><td>30.00</td></tr> <tr><td>0.88</td><td>35.00</td></tr> <tr><td>0.88</td><td>40.00</td></tr> <tr><td>0.88</td><td>50.00</td></tr> <tr><td>0.88</td><td>60.00</td></tr> </tbody> </table>	Depth to Water (m)	Elapsed Time (min)	0.90	0.00	0.90	1.00	0.88	2.00	0.88	3.00	0.87	4.00	0.87	5.00	0.87	10.00	0.87	15.00	0.87	20.00	0.88	25.00	0.88	30.00	0.88	35.00	0.88	40.00	0.88	50.00	0.88	60.00	<p>Depth of Pit (D) = 2.00 m</p> <p>Width of Pit (B) = 0.40 m</p> <p>Length of Pit (L) = 1.60 m</p> <p>Initial depth to Water = 0.90 m</p> <p>Final depth to water = 0.88 m</p> <p>Elapsed time (mins) = 60.00</p> <p>Top of permeable soil = m</p> <p>Base of permeable soil = m</p> <p>Base area = 0.64 m²</p> <p>*Av. side area of permeable stratum over test period = 4.44 m²</p> <p>Total Exposed area = 5.08 m²</p> <p>Infiltration rate (f) = Volume of water used/unit exposed area / unit time</p> <p style="text-align: center;">f = 0 m/min or 0 m/sec</p> <p style="text-align: center; color: red;">Water level rose during test</p>
Depth to Water (m)	Elapsed Time (min)																																
0.90	0.00																																
0.90	1.00																																
0.88	2.00																																
0.88	3.00																																
0.87	4.00																																
0.87	5.00																																
0.87	10.00																																
0.87	15.00																																
0.87	20.00																																
0.88	25.00																																
0.88	30.00																																
0.88	35.00																																
0.88	40.00																																
0.88	50.00																																
0.88	60.00																																



Soakaway Design f -value from field tests (F2C) IGSL

Contract: 22150	Contract No: 22150
Test No. TPSA02 - Cycle 1	Northing: 734565.043
Client ARUP	Easting: 698854.613
Date: 30/10/2019	Elevation: 51.856

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy gravelly CLAY	Dry
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

Depth to Water (m)	Elapsed Time (min)
0.95	0.00
0.95	1.00
0.95	2.00
0.95	3.00
0.96	4.00
0.96	5.00
0.96	10.00
0.96	15.00
0.96	20.00
0.96	25.00
0.96	30.00
0.96	35.00
0.96	40.00
0.96	50.00
0.96	60.00

Field Test

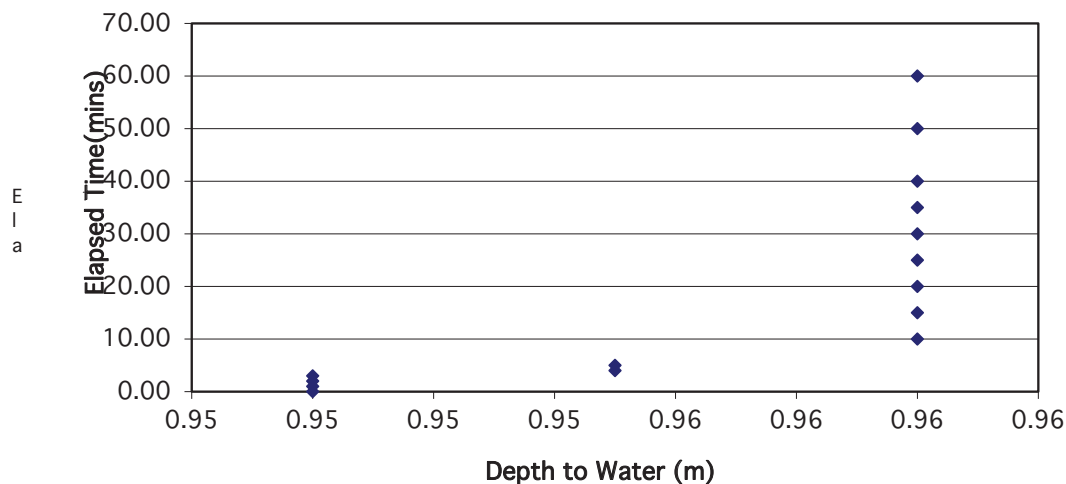
Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.95	m
Final depth to water =	0.96	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	4.598	m ²
Total Exposed area =	5.318	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec
No fall in water after 4 minutes

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: 22150	Contract No: 22150
Test No. TPSA02 - Cycle 2	Northing: 734565.043
Client ARUP	Easting: 698854.613
Date: 30/10/2019	Elevation: 51.856

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy gravelly CLAY	Dry
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

Depth to Water (m)	Elapsed Time (min)
0.83	0.00
0.83	1.00
0.83	2.00
0.84	3.00
0.84	4.00
0.84	5.00
0.84	10.00
0.84	15.00
0.84	20.00
0.84	25.00
0.84	30.00
0.84	35.00
0.84	40.00
0.84	50.00
0.84	60.00

Field Test

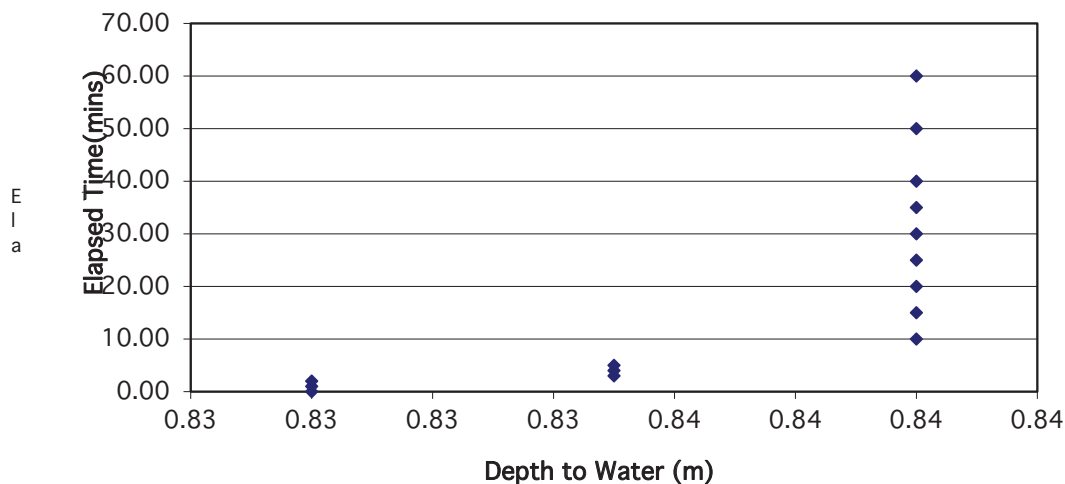
Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.83	m
Final depth to water =	0.84	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	5.126	m ²
Total Exposed area =	5.846	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec
No fall in water level after 3 mins

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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 GROUND at 0.5m
0.20	0.70	MADE GROUND comprised of brownish grey slightly sandy gravelly CLAY	
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

Depth to Water (m)	Elapsed Time (min)
0.74	0.00
0.74	1.00
0.75	2.00
0.76	3.00
0.76	4.00
0.76	5.00
0.77	10.00
0.77	15.00
0.77	20.00
0.77	25.00
0.77	30.00
0.78	35.00
0.78	40.00
0.78	50.00
0.79	60.00

Field Test

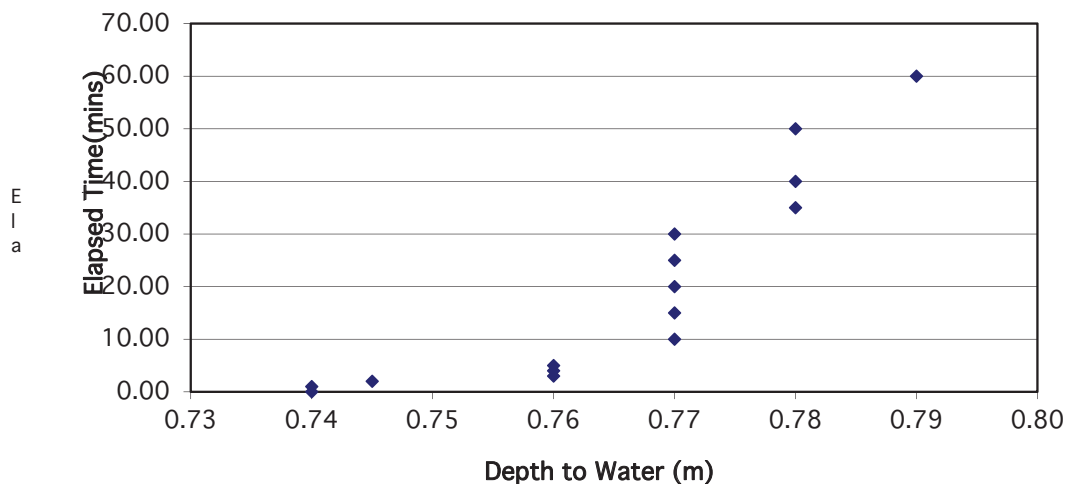
Depth of Pit (D)	1.80	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.74	m
Final depth to water =	0.79	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	4.554	m ²
Total Exposed area =	5.274	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00011 m/min or 1.896E-06 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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 GROUND at 0.5m
0.20	0.70	MADE GROUND comprised of brownish grey slightly sandy gravelly CLAY	
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

Depth to Water (m)	Elapsed Time (min)
0.90	0.00
0.90	1.00
0.90	2.00
0.91	3.00
0.91	4.00
0.91	5.00
0.92	10.00
0.92	15.00
0.92	20.00
0.93	25.00
0.93	30.00
0.93	35.00
0.94	40.00
0.94	50.00
0.94	60.00

Field Test

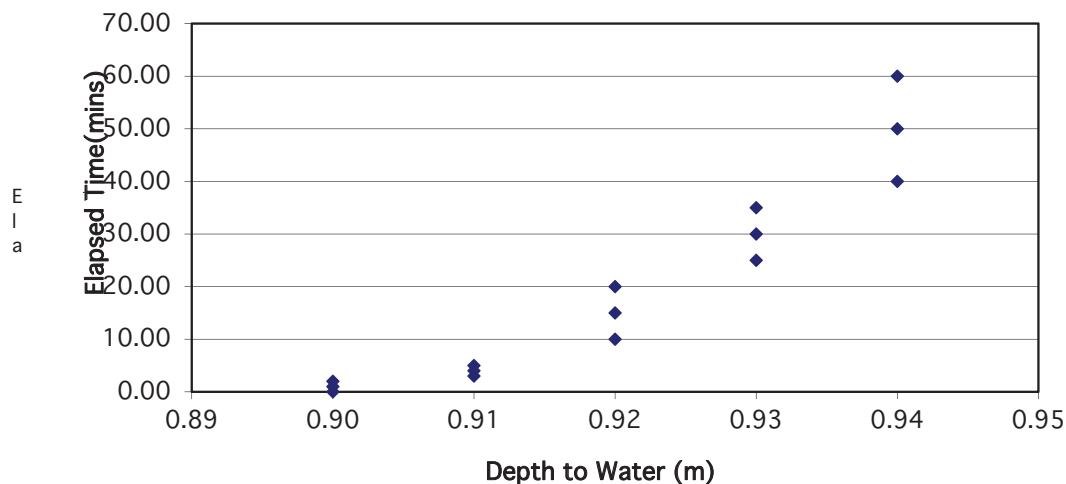
Depth of Pit (D)	1.80	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.90	m
Final depth to water =	0.94	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	3.872	m ²
Total Exposed area =	4.592	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.0001 m/min or 1.742E-06 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet	Water Influx at 1.0m
0.30	0.90	MADE GROUND comprised of brown sandy gravelly CLAY	
0.90	2.00	MADE GROUND comprised of dark grey to black sandy very gravelly C	
2.00	2.50	Firm brown mottled grey sandy gravelly CLAY	

Notes: One cycle carried out. Further cycles cancelled by Consulting Engineer due to influx of water

Field Data

Depth to Water (m)	Elapsed Time (min)
1.30	0.00
1.30	1.00
1.30	2.00
1.30	3.00
1.30	4.00
1.31	5.00
1.31	10.00
1.31	15.00
1.31	20.00
1.31	25.00
1.31	30.00
1.31	35.00
1.31	40.00
1.31	50.00
1.31	60.00

Field Test

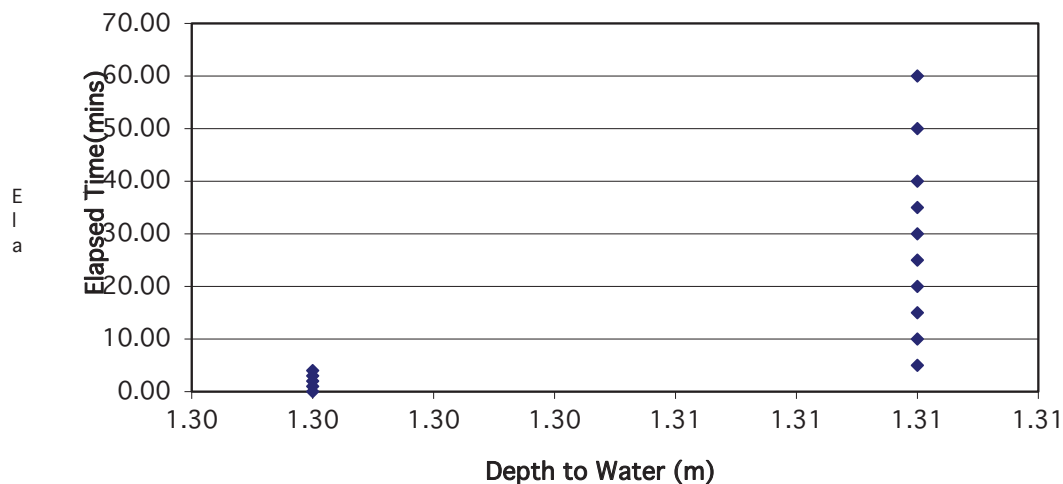
Depth of Pit (D)	2.50	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.60	m
Initial depth to Water =	1.30	m
Final depth to water =	1.31	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.64	m ²
*Av. side area of permeable stratum over test period	4.78	m ²
Total Exposed area =	5.42	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water level after 4 minutes

Depth of water vs Elapsed Time (mins)



TPSA01

RECEIVED: 18/07/2023



TPSA02

RECEIVED: 18/07/2023





RECEIVED: 18/07/2023



TPSA03

RECEIVED: 18/07/2023





RECEIVED: 18/07/2023

TPSA04




RECEIVED: 18/07/2023



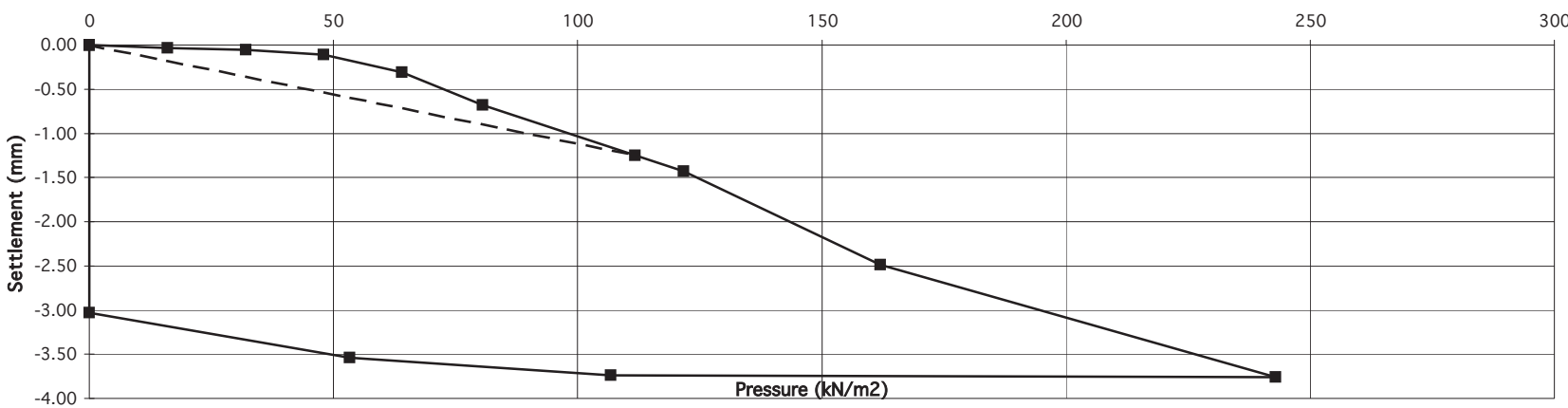
RECEIVED: 18/07/2023

Appendix 5
Plate Bearing Tests

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107335	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT01 Load	Firm brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698862.771
Depth	0.6m	Northing (m)	735057.67
Client	Arup	Ground Level (mOD)	50.832
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	07/11/2019		

Pressure / Settlement

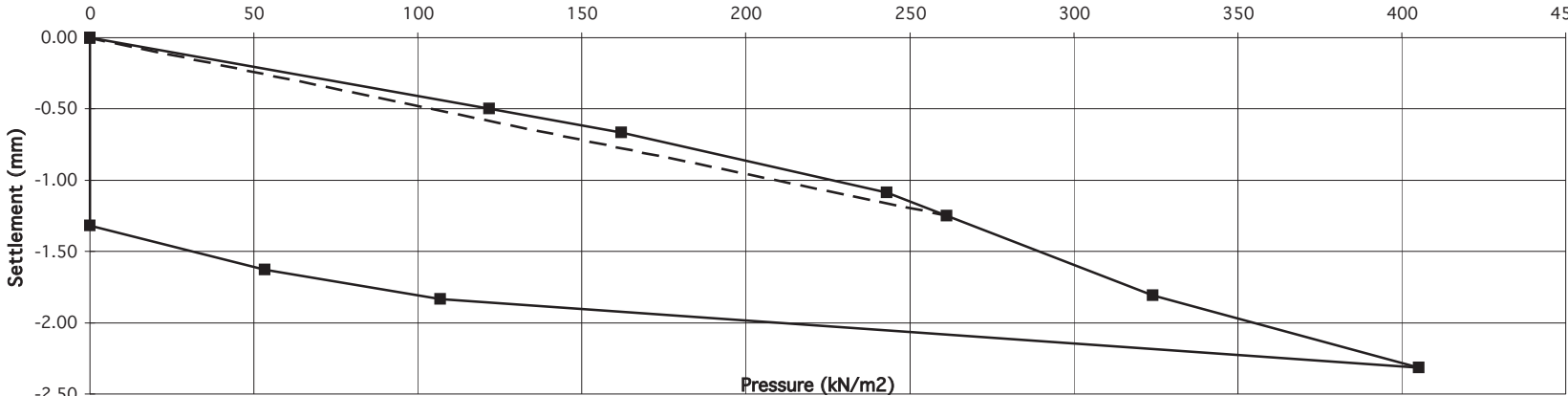


Gradient at 1.25 mm settlement intersection = 89		
Modulus of subgrade reaction = 58 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	10.8 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107355	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT01 Reload	Firm brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698862.771
Depth	0.6m	Northing (m)	735057.67
Client	Arup	Ground Level (mOD)	50.832
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	07/11/2019		



Pressure / Settlement



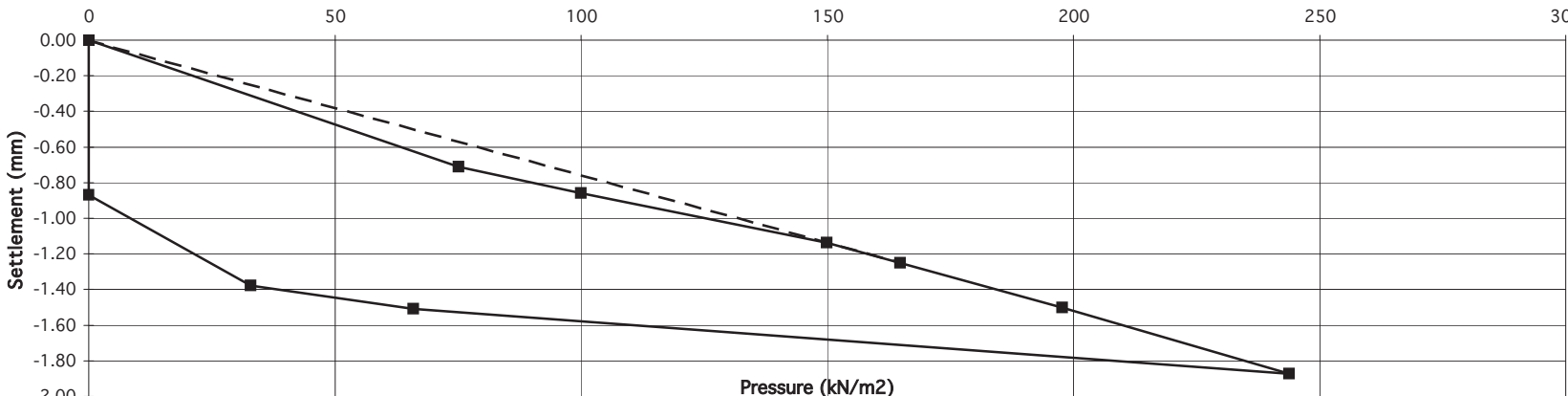
Pressure (kN/m ²)	Settlement (mm) - Curve 1 (Dashed)	Settlement (mm) - Curve 2 (Solid)	Settlement (mm) - Curve 3 (Solid with markers)
0	0.00	0.00	0.00
50	-0.20	-0.25	-0.60
100	-0.40	-0.50	-1.00
150	-0.60	-0.70	-1.30
200	-0.80	-0.90	-1.60
250	-1.00	-1.10	-1.80
300	-1.20	-1.30	-2.00
350	-1.40	-1.50	-2.20
400	-1.60	-1.70	-2.30
450	-1.80	-1.80	-2.40

Gradient at 1.25 mm settlement intersection = 209		
Modulus of subgrade reaction = 134 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	47.0 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107336	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT03 load	Firm to stiff greyish brown slightly sandy very gravelly CLAY	
Location	See Map	Easting (m)	698715.377
Depth	0.95m	Northing (m)	734959.854
Client	Arup	Ground Level (mOD)	52.928
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	Hugh Byrne		
Date	07/11/2019		

Pressure / Settlement

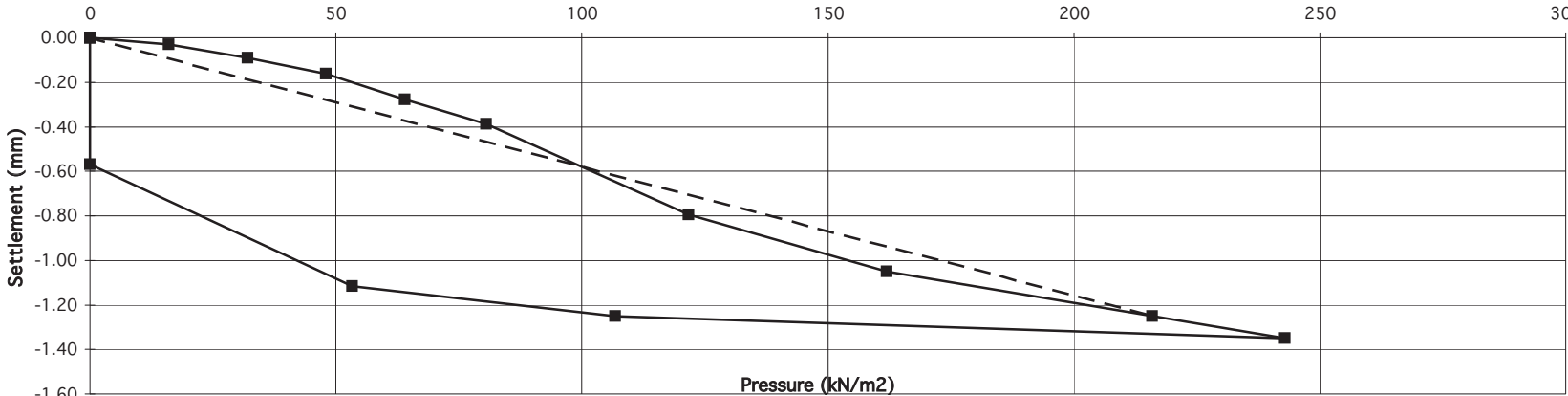


Gradient at 1.25 mm settlement intersection = 132	Equivalent CBR value in accordance with NRA HD25-26/10	21.2 %
Modulus of subgrade reaction = 85 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107336	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT03 Reload	Firm to stiff greyish brown slightly sandy very gravelly CLAY	
Location	See Map	Easting (m)	698715.377
Depth	0.95m	Northing (m)	734959.854
Client	Arup	Ground Level (mOD)	52.928
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	07/11/2019		



Pressure / Settlement



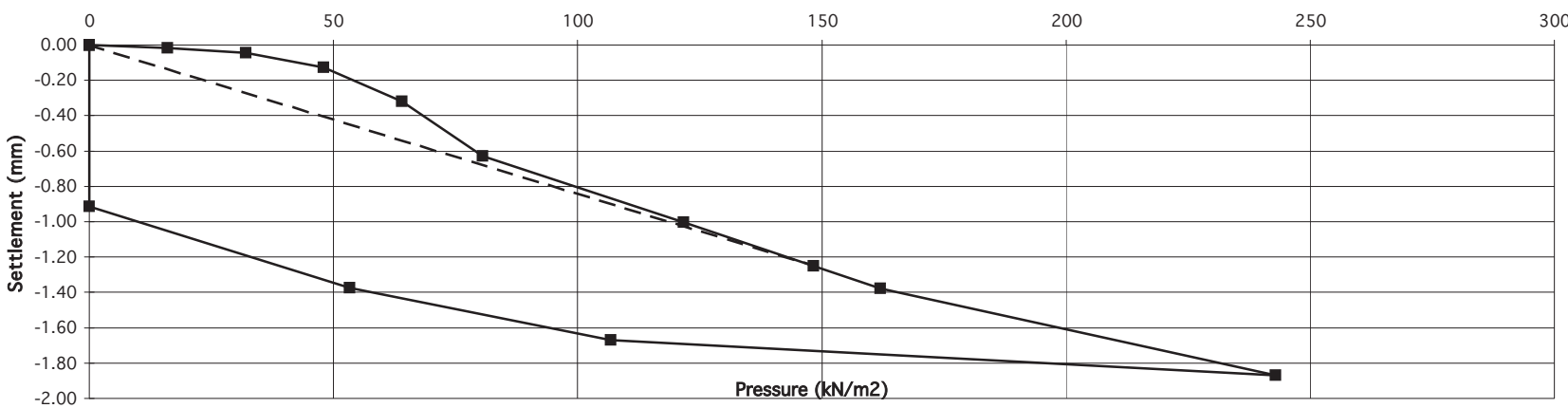
Pressure (kN/m ²)	Settlement (mm) - Series 1 (Solid, Squares)	Settlement (mm) - Series 2 (Dashed)	Settlement (mm) - Series 3 (Solid, Squares)
0	0.00	0.00	0.00
50	-0.15	-0.30	-0.55
100	-0.35	-0.55	-0.80
150	-0.60	-0.75	-1.05
200	-0.85	-0.95	-1.25
250	-1.15	-1.25	-1.35

Gradient at 1.25 mm settlement intersection = 173	Equivalent CBR value in accordance with NRA HD25-26/10	33.8 %
Modulus of subgrade reaction = 111 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107337	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT04 Load	Firm brown mottled grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698808.795
Depth	0.4m	Northing (m)	734863.887
Client	Arup	Ground Level (mOD)	51.555
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	07/11/2019		

Pressure / Settlement



Gradient at 1.25 mm settlement intersection = 119	Equivalent CBR value in accordance with NRA HD25-26/10	17.6 %
Modulus of subgrade reaction = 76 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		



RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107337	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT04 Reload	Firm brown mottled grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698808.795
Depth	0.4m	Northing (m)	734863.887
Client	Arup	Ground Level (mOD)	51.555
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	07/11/2019		

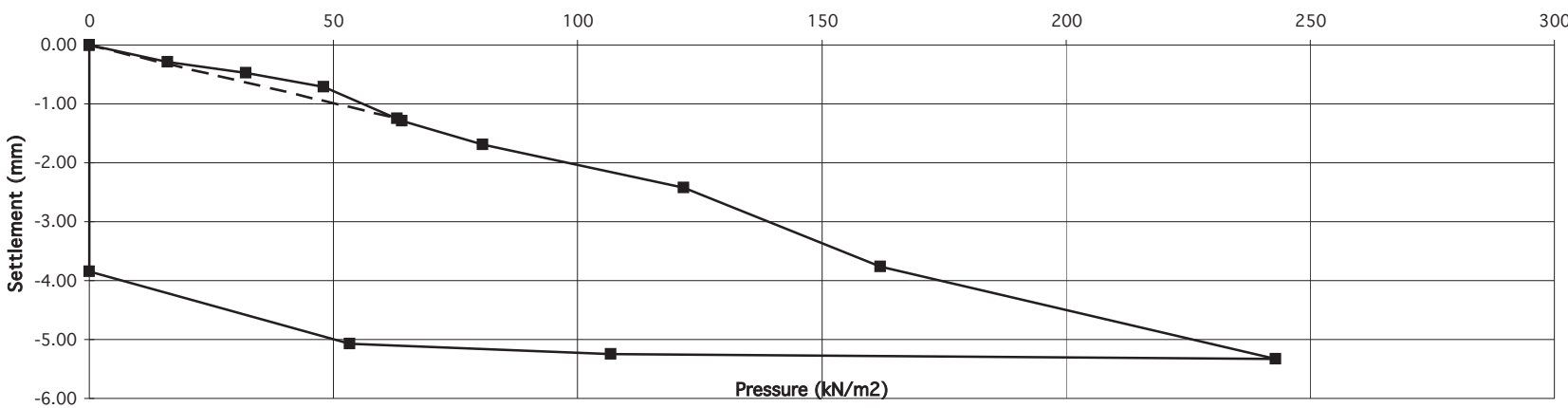
Pressure / Settlement

Gradient at 1.25 mm settlement intersection = 273	Equivalent CBR value in accordance with NRA HD25-26/10	74.9 %
Modulus of subgrade reaction = 176 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073358	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT05 Load	Firm brownish grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698522.695
Depth	0.6m	Northing (m)	734945.924
Client	Arup	Ground Level (mOD)	55.965
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		

Pressure / Settlement



Gradient at 1.25 mm settlement intersection = 50	Equivalent CBR value in accordance with NRA HD25-26/10	4.0 %
Modulus of subgrade reaction = 32 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107338	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT05 Reload	Firm brownish grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698522.695
Depth	0.6m	Northing (m)	734945.924
Client	Arup	Ground Level (mOD)	55.965
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		

Pressure / Settlement

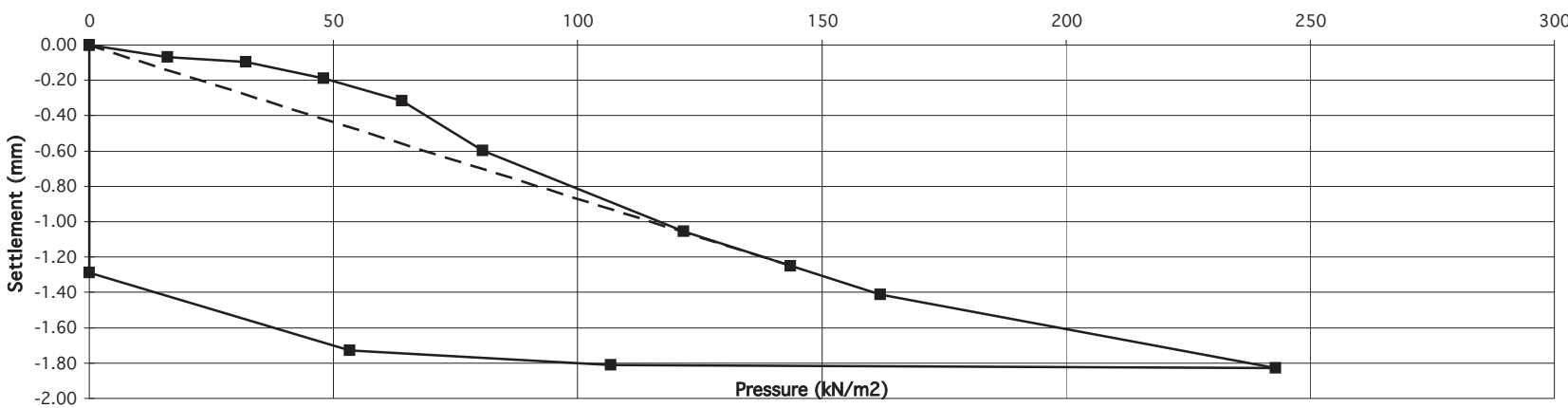
Pressure (kN/m ²)	Settlement (mm) - Upper Series	Settlement (mm) - Lower Series
0	0.00	-2.30
50	-0.50	-3.30
100	-1.00	-3.65
125	-1.25	-3.65
150	-1.65	-3.65
250	-2.30	-3.65
320	-2.60	-3.65
400	-3.65	-3.65

Gradient at 1.25 mm settlement intersection = 101	Equivalent CBR value in accordance with NRA HD25-26/10	13.2 %
Modulus of subgrade reaction = 65 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107339	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT06 Load	Firm light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698561.485
Depth	0.6m	Northing (m)	734805.081
Client	Arup	Ground Level (mOD)	54.489
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	01/11/2019		




Pressure / Settlement



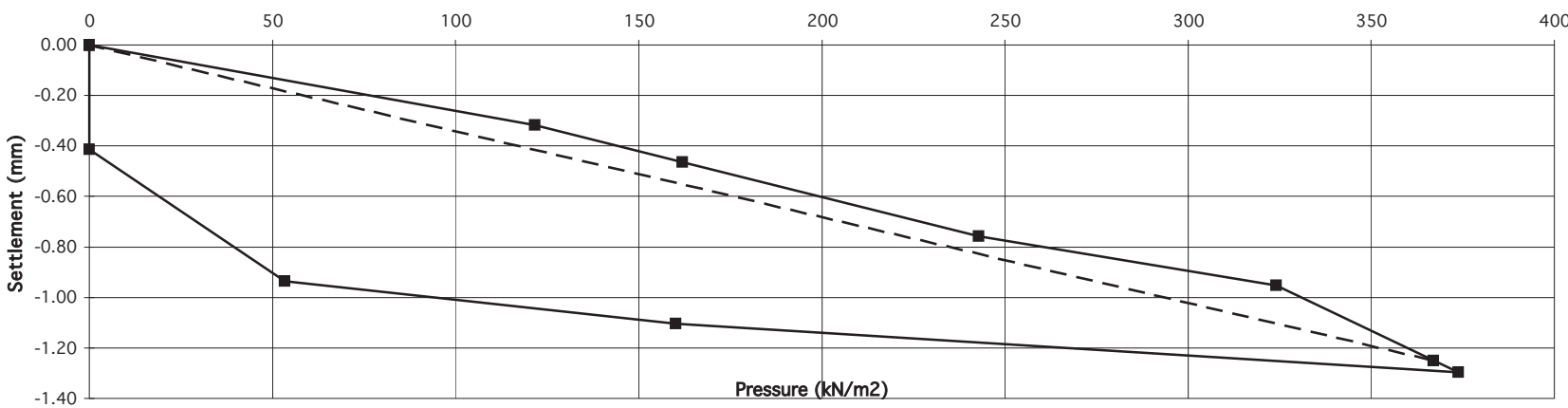
Pressure (kN/m ²)	Settlement (mm) - Series 1 (Solid)	Settlement (mm) - Series 2 (Dashed)	Settlement (mm) - Series 3 (Solid)
0	0.00	0.00	0.00
25	-0.10	-0.15	-0.10
50	-0.20	-0.30	-0.20
75	-0.35	-0.50	-0.35
100	-0.60	-0.70	-0.60
125	-1.00	-0.90	-1.00
150	-1.25	-1.10	-1.25
175	-1.45	-1.25	-1.45
200	-1.65	-1.35	-1.65
225	-1.80	-1.45	-1.80
250	-1.85	-1.55	-1.85

Gradient at 1.25 mm settlement intersection = 115	Equivalent CBR value in accordance with NRA HD25-26/10	16.7 %
Modulus of subgrade reaction = 74 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107339	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT06 Reload	Firm light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698561.485
Depth	0.6m	Northing (m)	734805.081
Client	Arup	Ground Level (mOD)	54.489
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	01/11/2019		



Pressure / Settlement



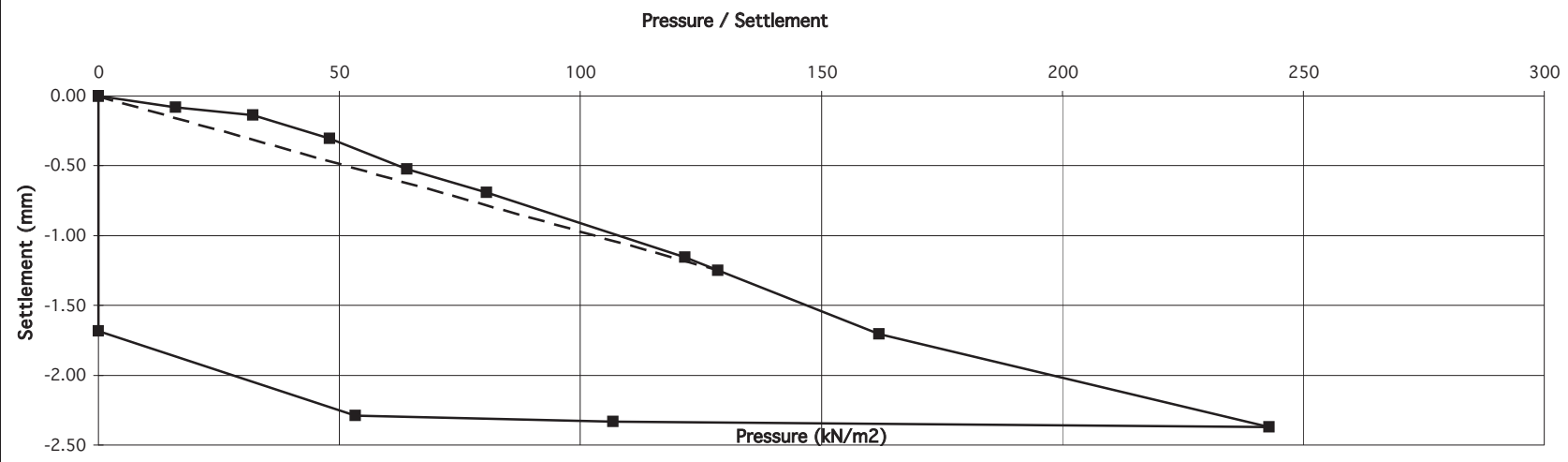
Pressure (kN/m ²)	Settlement (mm) - Solid Line 1	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line 2
0	0.00	0.00	0.00
50	-0.15	-0.20	-0.95
100	-0.30	-0.40	-1.00
150	-0.45	-0.55	-1.10
200	-0.60	-0.70	-1.15
250	-0.75	-0.85	-1.20
300	-0.90	-1.00	-1.25
350	-1.10	-1.15	-1.30
400	-1.30	-1.35	-1.35

Gradient at 1.25 mm settlement intersection = 294	Equivalent CBR value in accordance with NRA HD25-26/10	84.8 %
Modulus of subgrade reaction = 189 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107340	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT07 Load	Brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698495.699
Depth	0.5m	Northing (m)	734757.261
Client	Arup	Ground Level (mOD)	54.554
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>S.Cunningham</i>		
Date	04/11/2019		



Pressure / Settlement



Pressure (kN/m ²)	Settlement (mm)
0	0.00
10	-0.10
20	-0.15
30	-0.25
40	-0.35
50	-0.45
60	-0.55
70	-0.65
80	-0.75
90	-0.85
100	-0.95
110	-1.05
120	-1.15
130	-1.25
140	-1.35
150	-1.45
160	-1.55
170	-1.65
180	-1.75
190	-1.85
200	-1.95
210	-2.05
220	-2.15
230	-2.25
240	-2.35
250	-2.45
260	-2.50

Gradient at 1.25 mm settlement intersection = 103	Equivalent CBR value in accordance with NRA HD25-26/10	13.8 %
Modulus of subgrade reaction = 66 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073341	Description of soil under test (natural soil, placed fill, sub-base)	Brown mottled grey sandy gravelly CLAY
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT07 Reload	Easting (m) 698495.699 Northing (m) 734757.261 Ground Level (mOD) 54.554	 
Location	See Map		
Depth	0.5m	Sample Ref No.	N/A
Client	Arup	Depth	0.00 m bgl
Plate Diameter:	450 mm		
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test		
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		

Pressure / Settlement

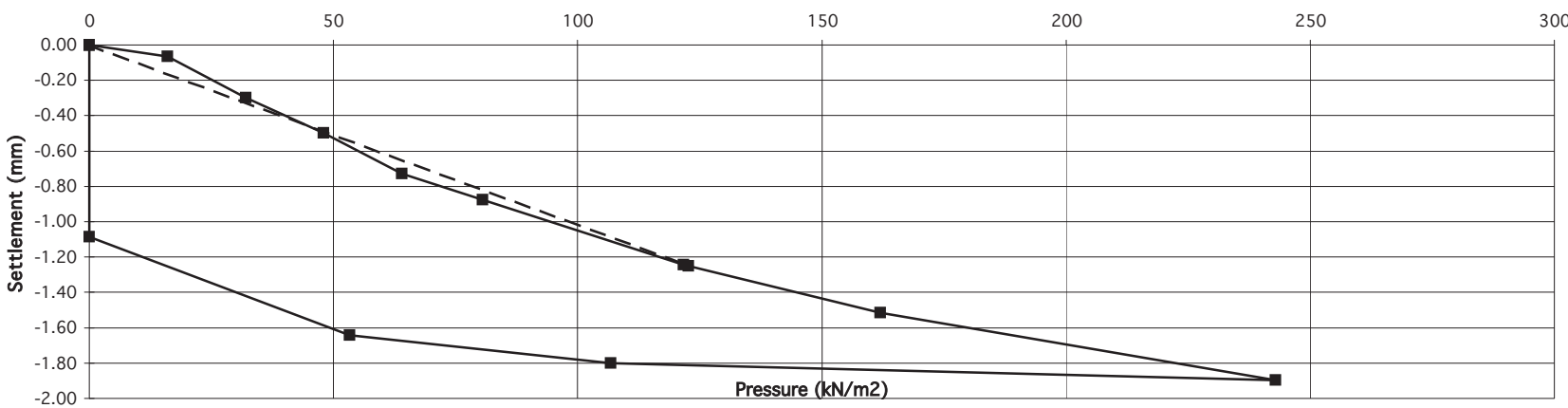
Pressure (kN/m ²)	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line
0	0.00	-0.85
50	-0.25	-1.35
100	-0.45	-1.55
150	-0.65	-1.65
200	-0.85	-1.75
219	-1.25	-1.25
250	-1.45	-1.85
300	-1.65	-1.95
350	-1.85	-2.00
400	-2.00	-2.00
450	-2.00	-2.00

Gradient at 1.25 mm settlement intersection = 219	Equivalent CBR value in accordance with NRA HD25-26/10	51.1 %
Modulus of subgrade reaction = 141 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107341	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT09 Load	Firm to stiff light brown mottled grey sandy gravelly CLAY	Easting (m) 698835.693
Location	See Map		
Depth	0.5m	Northing (m) 734298.251	Ground Level (mOD) 51.023
Client	Arup	Sample Ref No. N/A	Depth 0.00 m bgl
Plate Diameter:	450 mm		
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test		
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	05/11/2019		

Pressure / Settlement

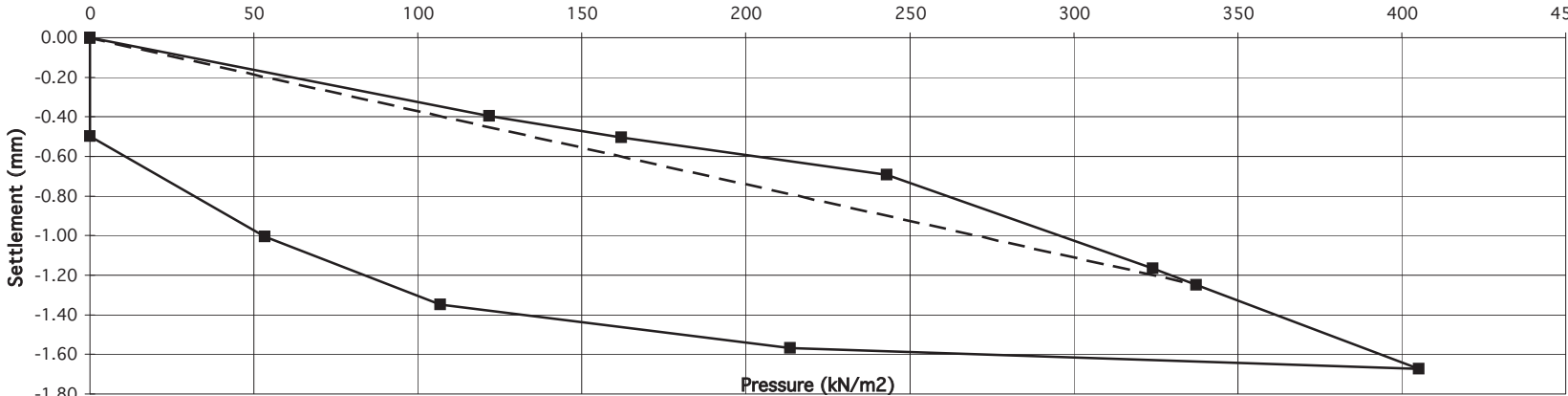


Gradient at 1.25 mm settlement intersection = 98		
Modulus of subgrade reaction = 63 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	12.7 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073341	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT09 Reload	Firm to stiff light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698835.693
Depth	0.5m	Northing (m)	734298.251
Client	Arup	Ground Level (mOD)	51.023
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	05/11/2019		




Pressure / Settlement



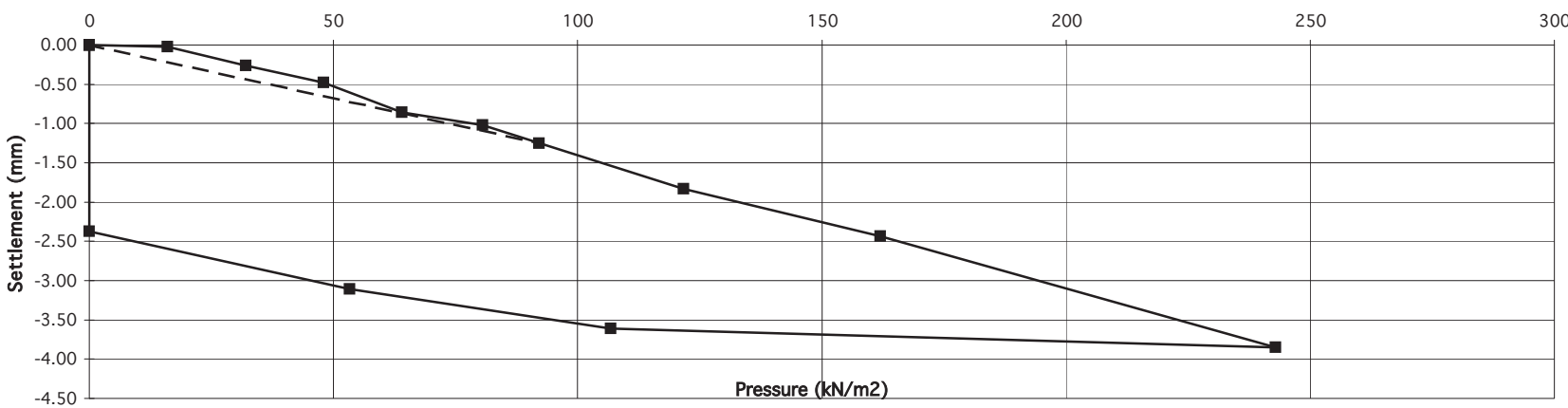
Pressure (kN/m ²)	Settlement (mm) - Solid Line	Settlement (mm) - Dashed Line
0	0.00	0.00
50	-0.95	-0.20
100	-1.35	-0.40
150	-1.55	-0.55
200	-1.65	-0.75
250	-1.70	-0.90
300	-1.72	-1.10
350	-1.73	-1.25
400	-1.74	-1.40
450	-1.75	-1.55

Gradient at 1.25 mm settlement intersection = 270	Equivalent CBR value in accordance with NRA HD25-26/10	73.3 %
Modulus of subgrade reaction = 174 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107342	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT10 Load	Firm brown sandy gravelly CLAY	
Location	See Map	Easting (m)	699053.493
Depth	0.4m	Northing (m)	734505.499
Client	Arup	Ground Level (mOD)	48.577
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by			
Date	31/10/2019		

Pressure / Settlement

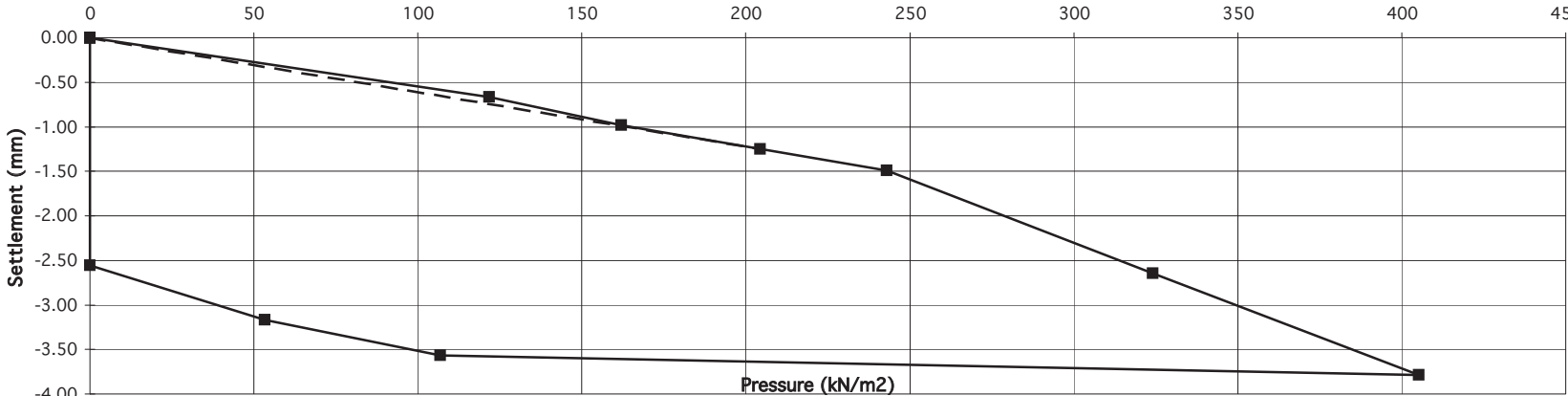


Gradient at 1.25 mm settlement intersection = 74		
Modulus of subgrade reaction = 47 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	7.7 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107342	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT10 Reload	Firm brown sandy gravelly CLAY	
Location	See Map	Easting (m)	699053.493
Depth	0.4m	Northing (m)	734505.499
Client	Arup	Ground Level (mOD)	48.577
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	31/10/2019		

Pressure / Settlement



Pressure (kN/m ²)	Settlement (mm) - Upper Curve	Settlement (mm) - Lower Curve
0	0.00	-2.50
50	-0.40	-3.20
100	-0.60	-3.60
125	-0.70	-3.65
160	-1.00	-3.70
200	-1.30	-3.75
250	-1.60	-3.80
420	-	-3.85

Gradient at 1.25 mm settlement intersection = 163	Equivalent CBR value in accordance with NRA HD25-26/10	30.7 %
Modulus of subgrade reaction = 105 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

Appendix 6
TRL DCP Probe Records

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)



Contract Liffey Park Technology Campus
 Client Arup
 Contract No. 22150

Date: 19/11/2019

Test No. PC01

DCP Zero Reading 255 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

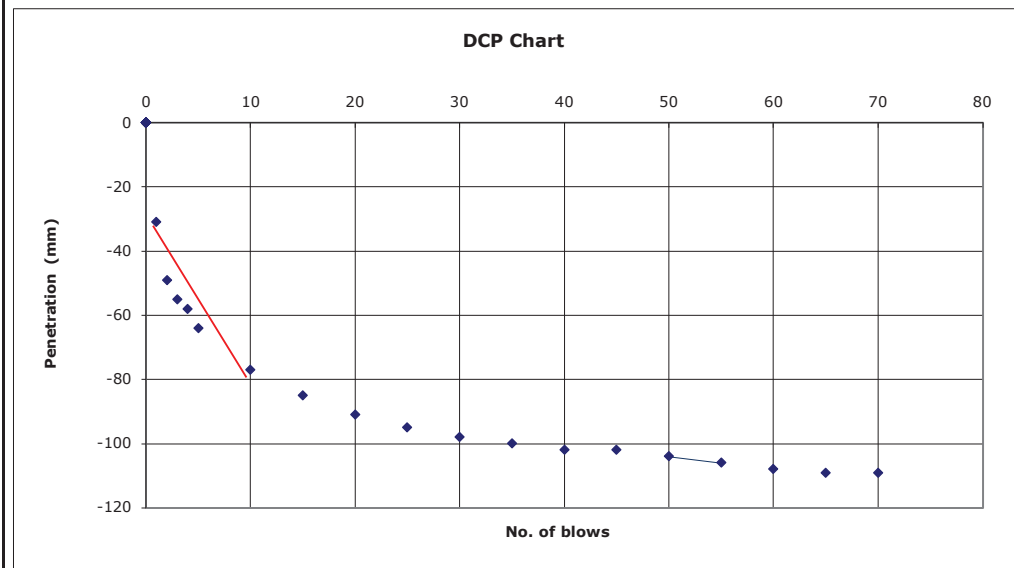
Layer No: 1

Co ordinates: E: 698398.96 N: 735199.588 Elv: 56.555

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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						
5	70	364						

RECEIVED: 18/07/2023



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
	31	77	46	5
Blows	1	10	9	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 1.731$

CBR = 53.8

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)



Contract Liffey Park Technology Campus
 Client Arup
 Contract No. 22150

Date: 19/11/2019

Test No. PC02

DCP Zero Reading 270 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

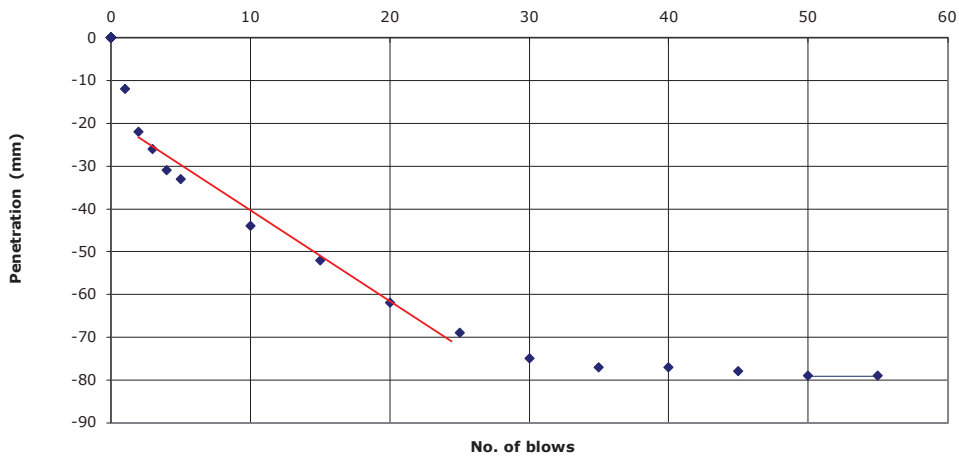
Layer No: 1

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

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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	50	349						
5	55	349						

DCP Chart



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
	22	69	47	2
Blows	2	25	23	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 2.152$

CBR = 141.9

RECEIVED: 18/07/2023

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)



Contract Liffey Park Technology Campus
 Client Arup
 Contract No. 22150

Date: 19/11/2019

Test No. PC03

DCP Zero Reading 267 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

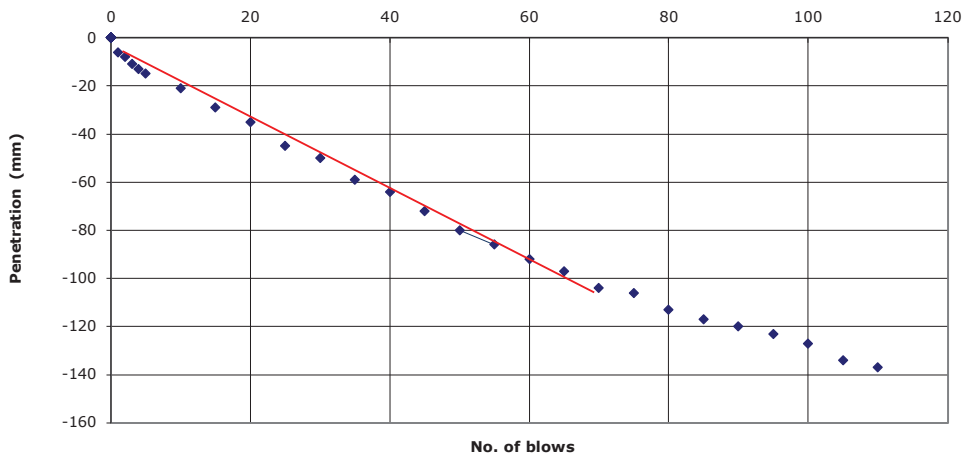
Layer No: 1

Co ordinates: E: 698807.659 N: 735053.219 Elev: 51.137

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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						

DCP Chart



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
	8	104	96	1
Blows	2	70	68	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 2.322$

CBR = 209.7

RECEIVED: 18/07/2023

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)



Contract Liffey Park Technology Campus
 Client Arup
 Contract No. 22150

Date: 19/11/2019

Test No. PC74A

DCP Zero Reading 297 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

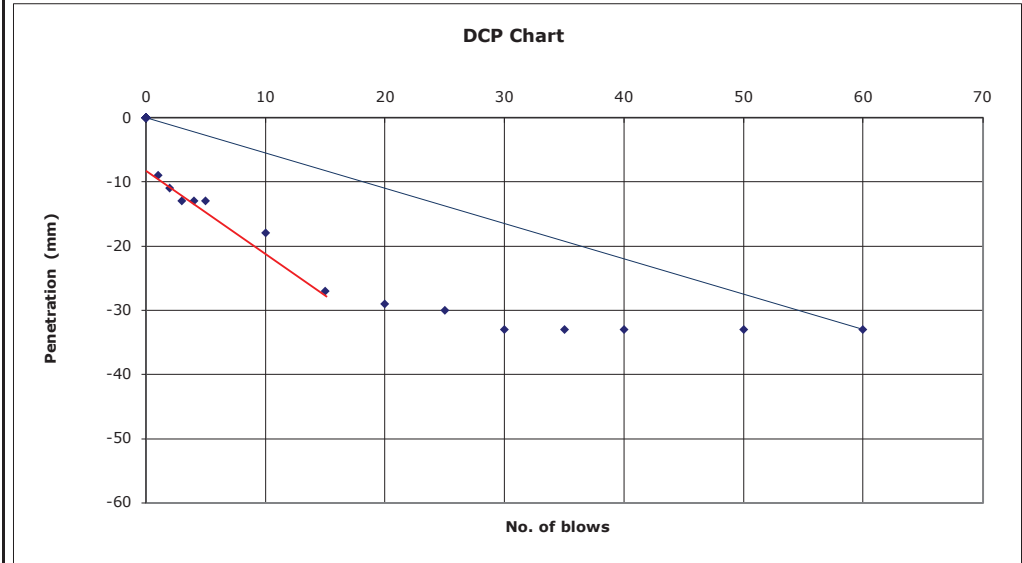
Layer No: 1

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

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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						

RECEIVED: 18/07/2023



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
	9	27	18	1
Blows	1	15	14	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 2.365$

CBR = 231.5

Dynamic Cone Penetrometer

IGSL Field Records and Temps (F20)



Contract Liffey Park Technology Campus
 Client Arup
 Contract No. 22150

Date: 19/11/2019

Test No. PC74B

DCP Zero Reading 293 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

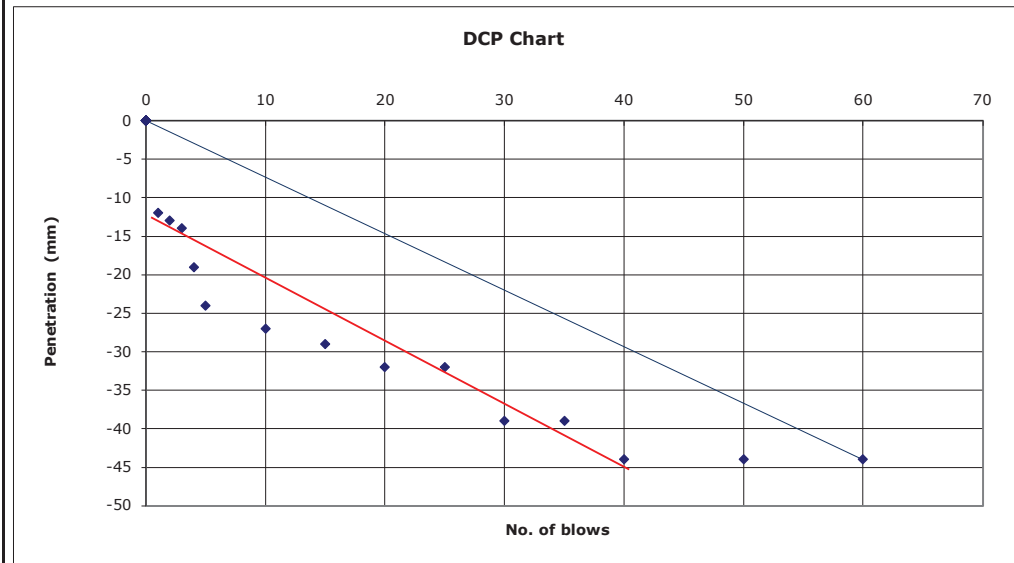
Layer No: 1

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

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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						

RECEIVED: 18/07/2023



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
Blows	12	44	32	1
	1	40	39	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 2.571$

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

Test No. PC05

DCP Zero Reading 153 mm

Location : See map (road)

Start of Test at: 0.0 m bgl

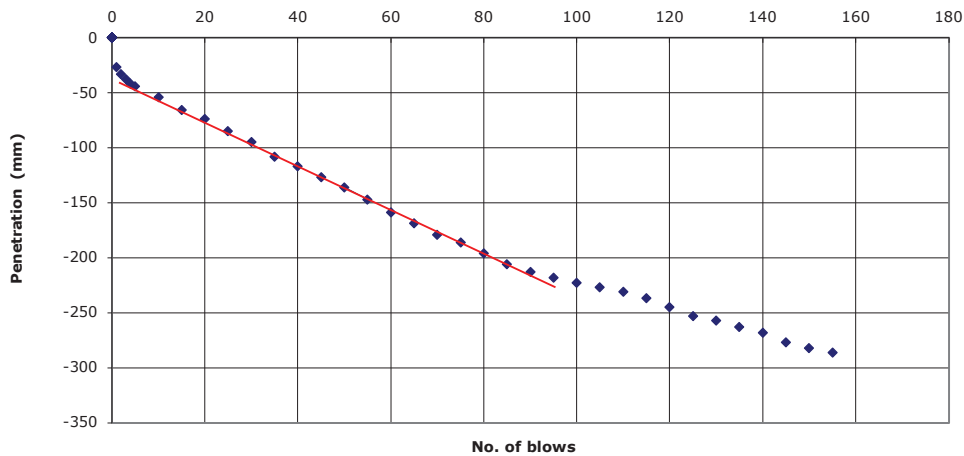
Layer No: 1

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

Soil Description: Grey sandy GRAVEL (roadbase)

No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading mm	No of Blows	Total Blows	Reading 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						

DCP Chart



Start Depth 0.0 m bgl

* Penetration range (mm)	** From	to	Penetration	mm / blow
	42	218	176	2
Blows	4	95	91	

TRRL RN8 $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 * \text{Log}_{10}(\text{mm/blow})$

$\text{Log}_{10}(\text{CBR}) = 2.177$

CBR = 150.4

RECEIVED: 18/07/2023

RECEIVED: 18/07/2023

Appendix 7
Groundwater Monitoring

RECEIVED: 18/07/2023

Appendix 8
Geotechnical Laboratory Testing

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



RECEIVED: 18/01/2023

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 Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
BH05	AA120053	1.0	A19/5945	B	18								Brown sandy gravelly SILT/CLAY
BH05	AA120054	2.0	A19/5946	B	17								Brown sandy gravelly SILT/CLAY
BH07	AA120063	1.5	A19/5947	B	13								Brown sandy gravelly SILT/CLAY
BH11	AA120060	2.0	A19/5948	B	16								Grey/brown sandy gravelly SILT/CLAY
BH11	AA120061	3.0	A19/5949	B	24								Grey/brown sandy gravelly SILT/CLAY
BH08	AA120069	2.0	A19/5950	B	9.1								Grey/black very gravelly SILT/CLAY
BH10	AA120074	1.4	A19/5951	B	13								Brown sandy gravelly SILT/CLAY

Notes: Preparation: WS - Wet sieved Sample Type: B - Bulk Disturbed Remarks: Results apply to the sample as received.
 AR - As received U - Undisturbed
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 4.4 Cone Penetrometer one point method
 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	Approved by	Date	Page
	H Byrne (Laboratory Manager)		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



RECEIVED: 18/01/2023

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	B	11	33	17	16	60	WS	4.4	C L	Grey/brown sandy gravelly CLAY
TP01	AA123648	1.4	A19/5953A	B	13	33	15	18	58	WS	4.4	C L	Grey/brown sandy gravelly CLAY
TP02	AA118622	0.7	A19/5953B	B	16								Grey/black sandy gravelly SILT/CLAY
TP02	AA118624	1.7	A19/5954	B	17								Dark brown very gravelly sandy SILT/CLAY
TP03	AA108755	0.7	A19/5955	B	6.0								Black/grey slightly clayey/silty, sandy, GRAVEL
TP03	AA108756	1.5	A19/5956	B	15	36	22	14	23	WS	4.4	C I	Dark grey sandy gravelly CLAY
TP04	AA123643	0.7	A19/5957	B	15	28	16	12	63	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
TP04	AA123644	1.2	A19/5958	B	14	32	17	15	56	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
TP04	AA123645	1.7	A19/5959	B	11	31	16	15	45	WS	4.4	C L	Black/brown slightly sandy, gravelly, CLAY
TP05	AA116285	1.1	A19/5960	B	13	33	17	16	57	WS	4.4	C L	Brown sandy gravelly CLAY
TP05	AA116286	2.2	A19/5961	B	15	37	25	12	31	WS	4.4	M I	Grey/brown sandy gravelly SILT
TP06	AA108760	0.8	A19/5962	B	13	28	14	14	50	WS	4.4	C L	Brown slightly sandy, slightly gravelly, CLAY
TP06	AA108761	1.7	A19/5963	B	15	33	19	14	54	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
TP07	AA116289	1.0	A19/5965	B	21								Brown sandy gravelly SILT/CLAY
TP08	AA116275	1.5	A19/5966	B	12	35	18	17	50	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY

Notes: Preparation: WS - Wet sieved Sample Type: B - Bulk Disturbed Remarks: Results apply to the sample as received.
 AR - As received U - Undisturbed
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 4.4 Cone Penetrometer one point method
 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	Approved by	Date	Page
	H Byrne (Laboratory Manager)		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



RECEIVED: 18/01/2023

Report No. **R108604** 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
TP08	AA116277	2.3	A19/5962	B	9.4	30	15	15	52	WS	4.4	C L	Dark brown slightly sandy, gravelly, CLAY
TP09	AA116279	0.7	A19/5968	B	14	29	17	12	40	WS	4.4	C L	Grey/brown sandy gravelly CLAY
TP09	AA116283	2.5	A19/5969	B	13	26	14	12	35	WS	4.4	C L	Grey/brown sandy gravelly CLAY
TP10	AA118606	0.8	A19/5970	B	19	34	18	16	63	WS	4.4	C L	Brown slightly sandy, slightly gravelly, CLAY
TP10	AA118607	1.6	A19/5971	B	10	35	20	15	51	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY with many cobbles
TP11	AA118616	1.5	A19/5972	B	25								Brown very sandy, slightly gravelly, SILT/CLAY
TP11	AA118617	2.6	A19/5973	B	14	36	20	16	58	WS	4.4	C I	Dark brown sandy gravelly CLAY
TPSA01	AA128606	0.5	A19/5974	B	31	49	23	26	74	WS	4.4	C I	Brown slightly sandy, slightly gravelly, CLAY
TPSA01	AA128608	1.5	A19/5975	B	25	46	22	24	70	WS	4.4	C I	Mottled brown slightly sandy, slightly gravelly, CLAY
TPSA02	AA118610	1.3	A19/5976	B	33	50	30	20	86	WS	4.4	M I	Brown slightly sandy, slightly gravelly, SILT
TPSA02	AA118611	1.8	A19/5977	B	12	33	17	16	60	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
TPSA03	AA118602	0.8	A19/5978	B	12	33	17	16	59	WS	4.4	C L	Brown slightly sandy, slightly gravelly, CLAY
TPSA03	AA118603	1.7	A19/5979	B	17	34	18	16	67	WS	4.4	C L	Brown slightly sandy, gravelly, CLAY
TPSA04	AA128602	0.6	A19/5980	B	24								Brown slightly sandy, slightly gravelly, SILT/CLAY
TPSA04	AA128604	2.2	A19/5981	B	14	42	21	21	61	WS	4.4	C I	Brown slightly sandy, gravelly, CLAY

Notes: Preparation: WS - Wet sieved
 AR - As received
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 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	Approved by	Date	Page
	H Byrne (Laboratory Manager)		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



RECEIVED: 18/10/2023

Report No. **R108605** 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: 09/01/20

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
TPSA04	AA128605	2.6	A19/5982	B	17	34	20	14	92	WS	4.4	C L	Dark brown slightly sandy, gravelly, CLAY

Notes: Preparation: WS - Wet sieved Sample Type: B - Bulk Disturbed Remarks: Results apply to the sample as received.
 AR - As received U - Undisturbed
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 4.4 Cone Penetrometer one point method
 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	Approved by	Date	Page
	H Byrne (Laboratory Manager)		24/01/20	1 of 1

TEST REPORT

Determination of Particle Size Distribution

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

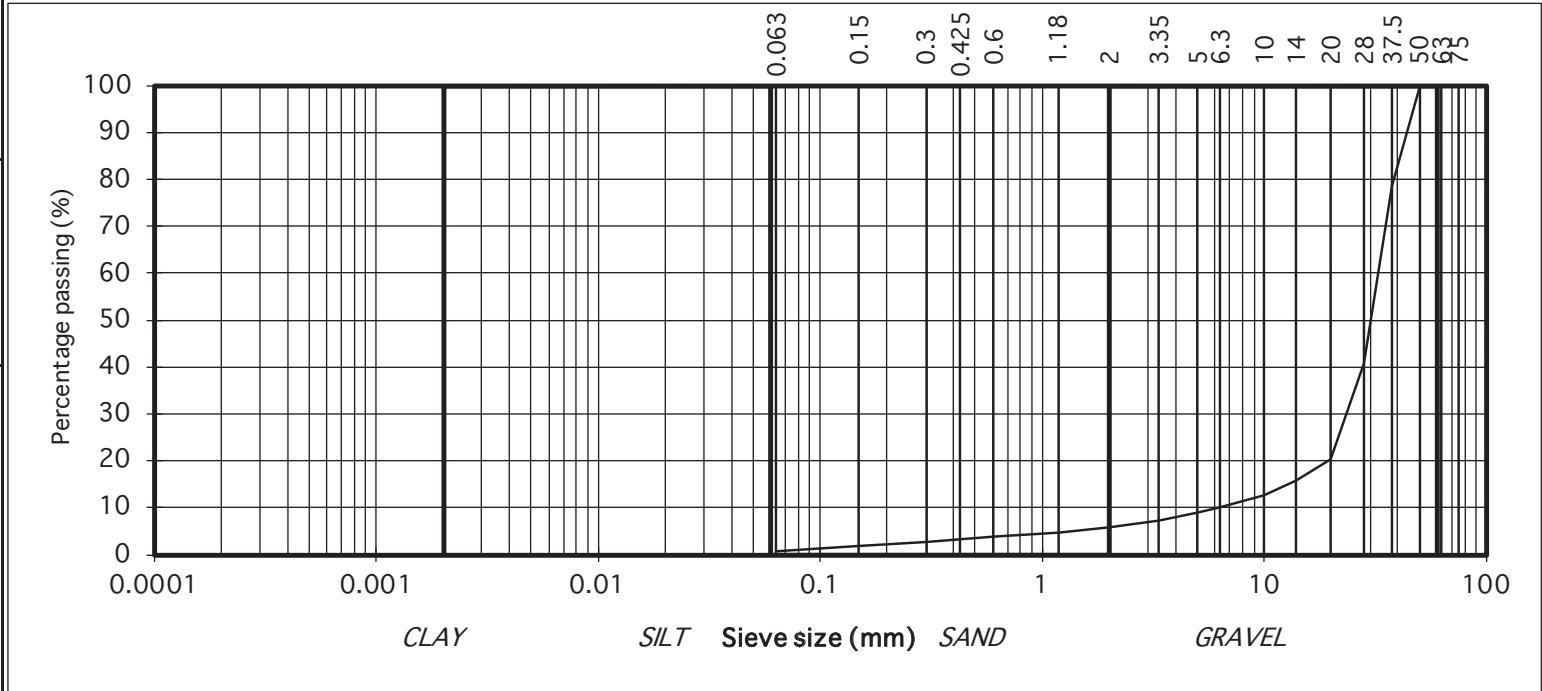


RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	79	
28	41	GRAVEL
20	20	
14	16	
10	13	
6.3	10	
5	9	
3.35	7	
2	6	
1.18	5	
0.6	4	
0.425	3	SAND
0.3	3	
0.15	2	
0.063	1	SILT/CLAY

Contract No: 22150 Report No. R108675
 Contract: Liffey Park Technology Park
 BH/TP : TPO3
 Sample No. AA108755 Lab. Sample No. A19/5955
 Sample Type: B
 Depth (m) 0.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Black/grey slightly clayey/silty, sandy, GRAVEL

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377: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



TEST REPORT

Determination of Particle Size Distribution

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



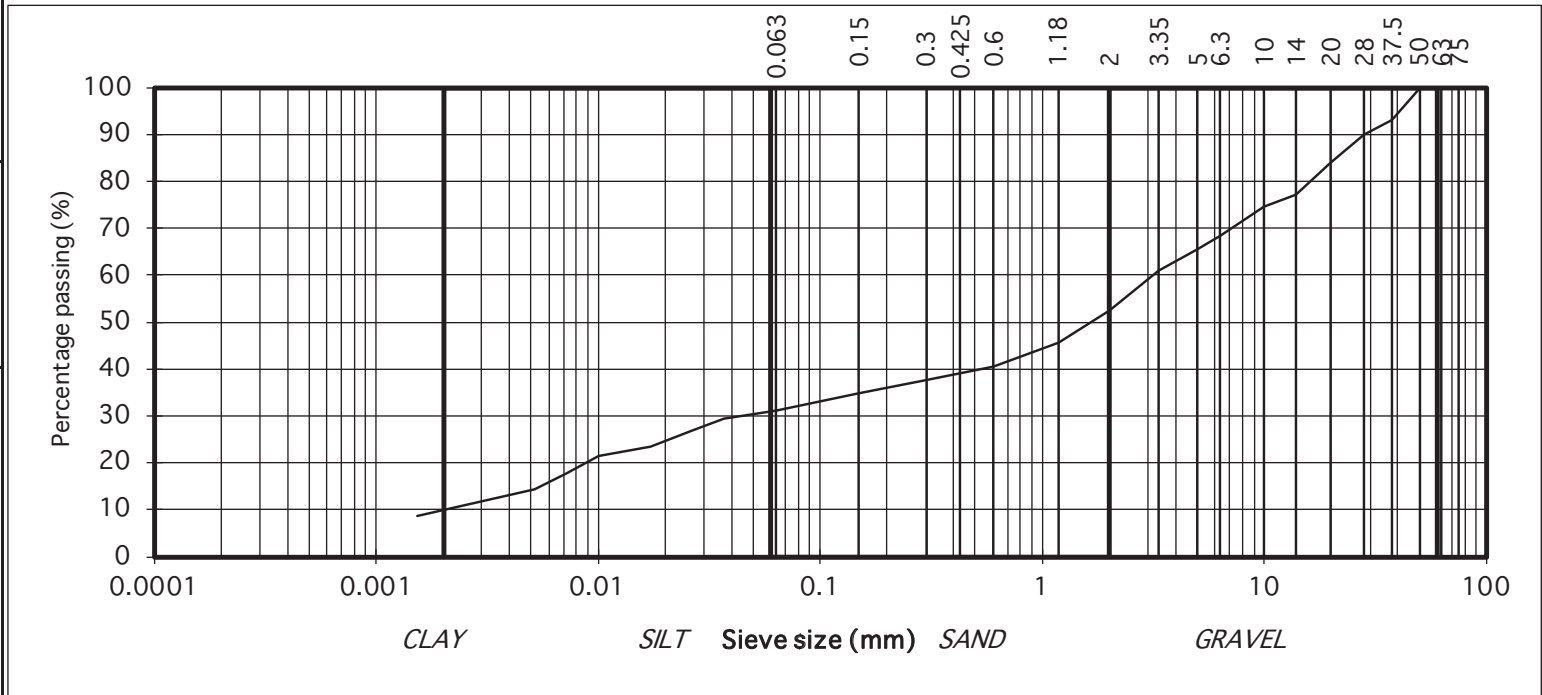
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	93	GRAVEL
28	90	
20	84	
14	77	
10	75	
6.3	68	
5	66	
3.35	61	
2	52	
1.18	46	
0.6	40	SAND
0.425	39	
0.3	38	
0.15	35	SILT/CLAY
0.063	31	
0.037	29	
0.027	27	
0.017	24	
0.010	21	
0.007	18	
0.005	14	
0.002	9	

Contract No: 22150 Report No. R109127
 Contract: Liffey Park Technology Park
 BH/TP : TP04
 Sample No. AA123643 Lab. Sample No. A19/5957
 Sample Type: B
 Depth (m) 0.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



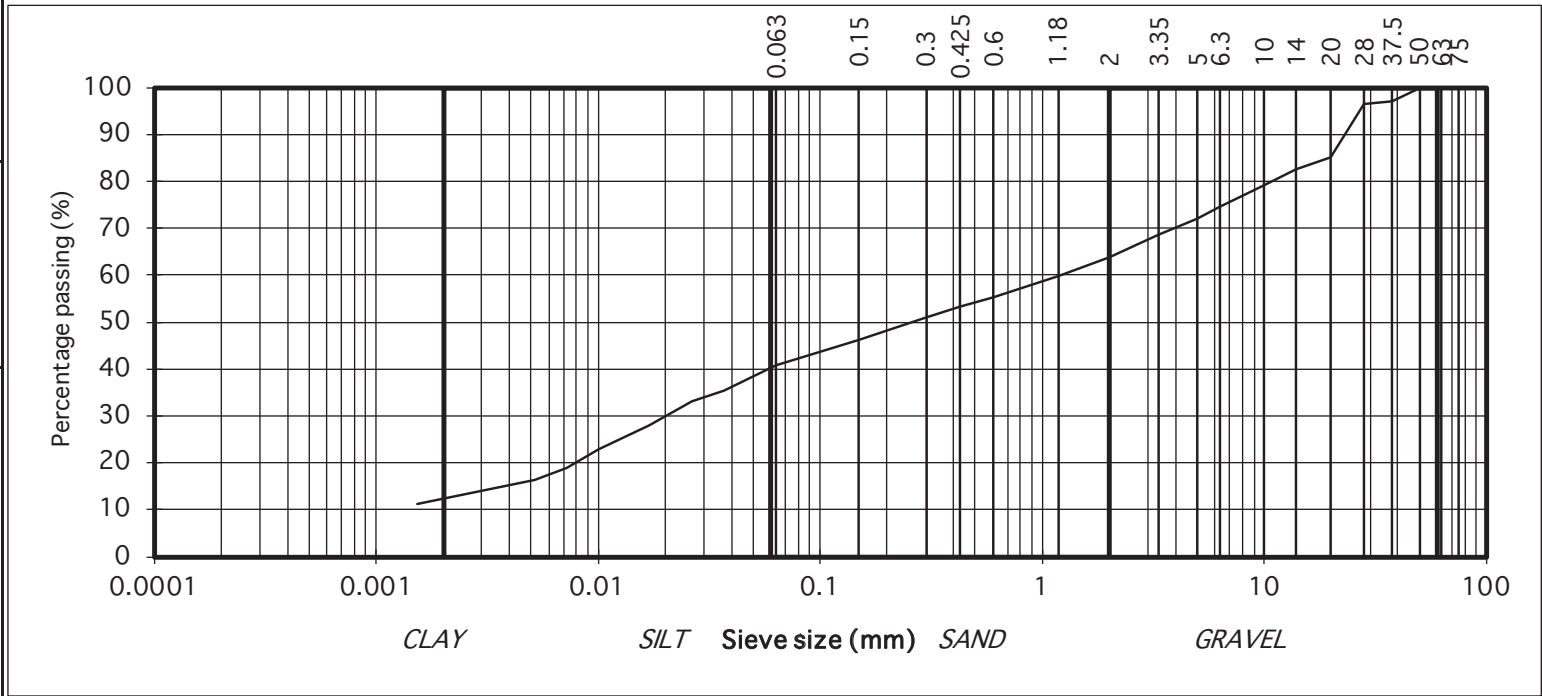
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	97	
28	97	
20	85	GRAVEL
14	83	
10	79	
6.3	75	
5	72	
3.35	69	
2	64	
1.18	60	SAND
0.6	55	
0.425	53	
0.3	51	
0.15	46	
0.063	41	SILT/CLAY
0.037	35	
0.026	33	
0.017	28	
0.010	23	
0.007	19	
0.005	16	
0.002	11	

Contract No: 22150 Report No. R108653
 Contract: Liffey Park Technology Park
 BH/TP : TP04
 Sample No. AA123644 Lab. Sample No. A19/5958
 Sample Type: B
 Depth (m) 1.20 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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

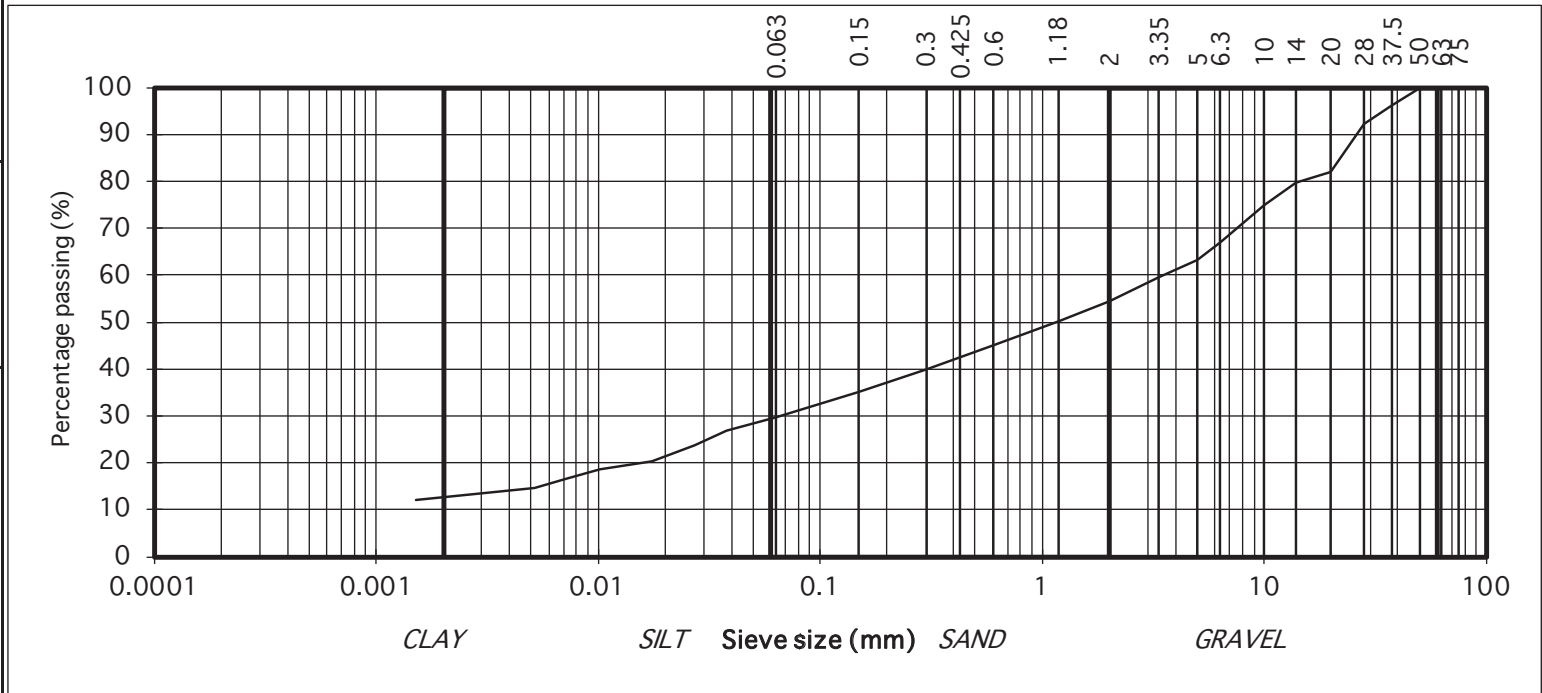


RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	96	
28	92	
20	82	GRAVEL
14	80	
10	75	
6.3	67	
5	63	
3.35	60	
2	54	
1.18	50	SAND
0.6	45	
0.425	43	
0.3	40	
0.15	35	
0.063	30	SILT/CLAY
0.038	27	
0.027	24	
0.018	20	
0.010	18	
0.007	17	
0.005	15	
0.002	12	

Contract No: 22150 Report No. R108676
 Contract: Liffey Park Technology Park
 BH/TP : TP04
 Sample No. AA123645 Lab. Sample No. A19/5959
 Sample Type: B
 Depth (m) 1.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Black/brown slightly sandy, gravelly, CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



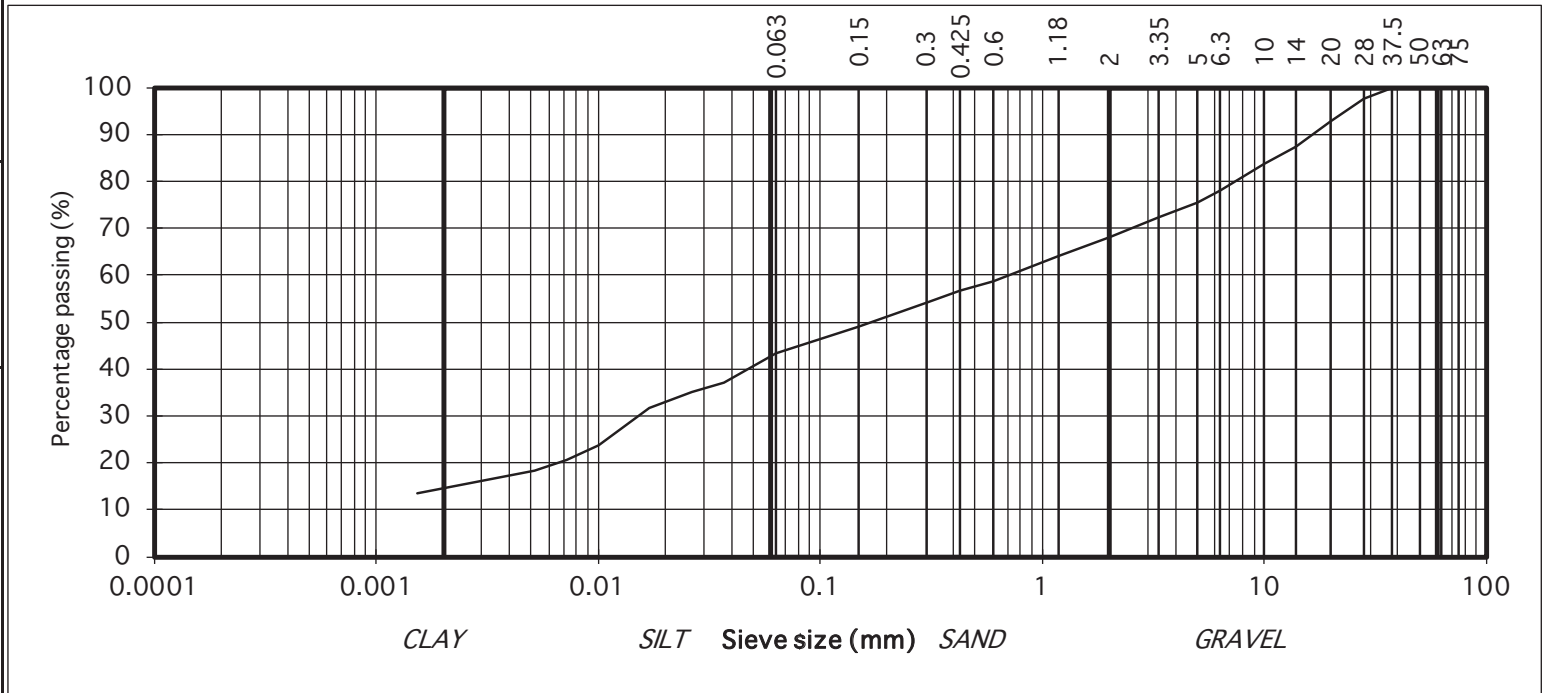
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	98	
20	93	GRAVEL
14	87	
10	84	
6.3	78	
5	75	
3.35	72	
2	68	
1.18	64	SAND
0.6	59	
0.425	57	
0.3	54	
0.15	49	
0.063	43	SILT/CLAY
0.037	37	
0.026	35	
0.017	32	
0.010	24	
0.007	20	
0.005	18	
0.002	14	

Contract No: 22150 Report No. R108714
 Contract: Liffey Park Technology Park
 BH/TP : TPO6
 Sample No. AA108760 Lab. Sample No. A19/5962
 Sample Type: B
 Depth (m) 0.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



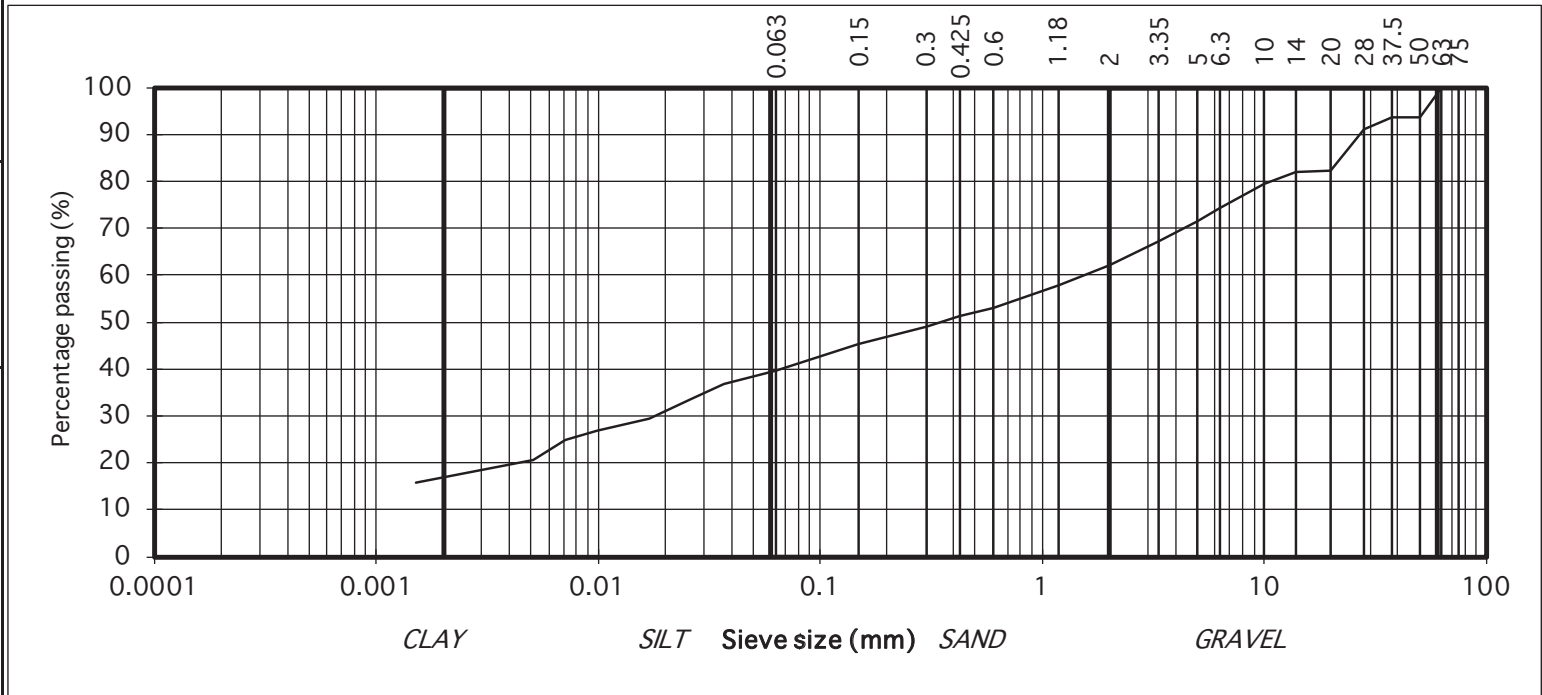
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	94	
37.5	94	GRAVEL
28	91	
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	
0.3	49	
0.15	45	SILT/CLAY
0.063	40	
0.037	37	
0.027	34	
0.017	29	
0.010	27	
0.007	25	
0.005	21	
0.002	16	

Contract No: 22150 Report No. R108654
 Contract: Liffey Park Technology Park
 BH/TP : TPO6
 Sample No. AA108761 Lab. Sample No. A19/5963
 Sample Type: B
 Depth (m) 1.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



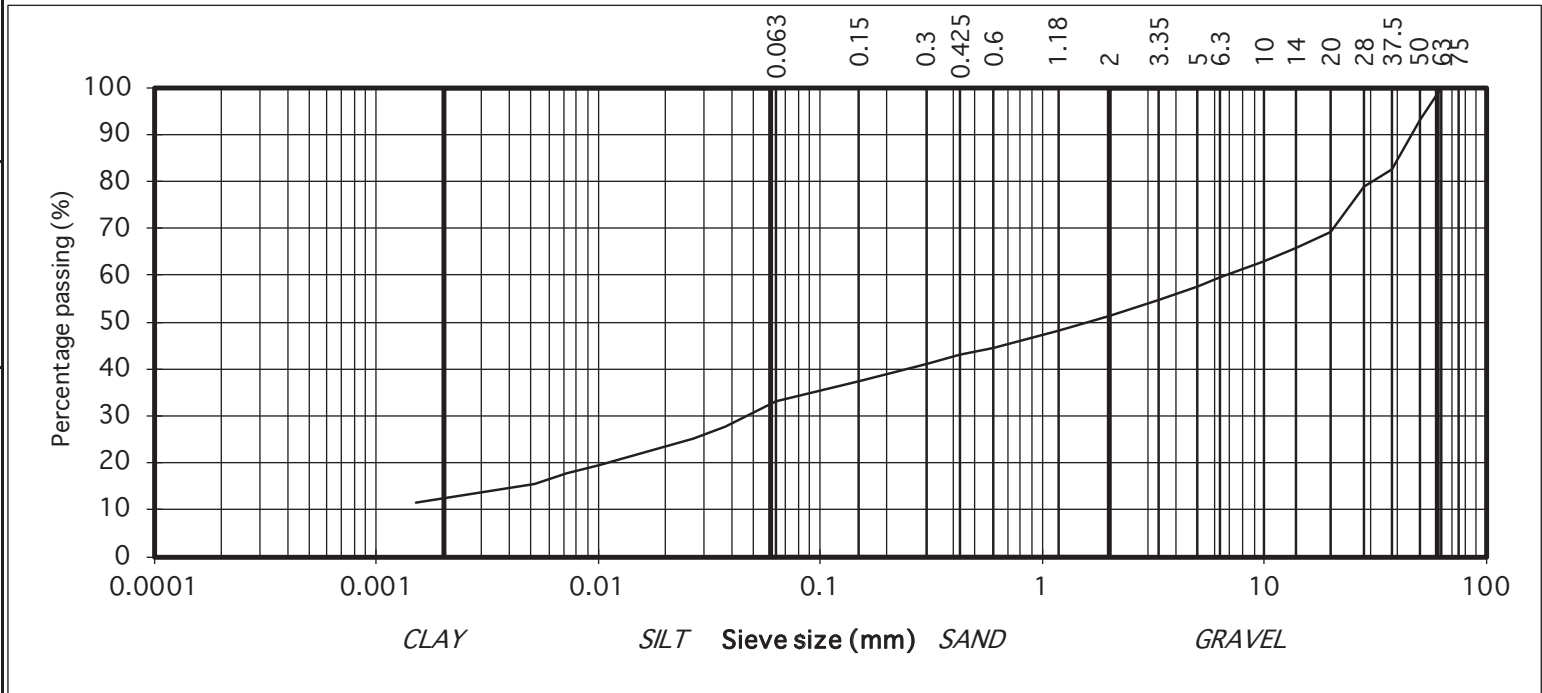
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	93	GRAVEL
37.5	83	
28	79	
20	69	
14	66	
10	63	
6.3	59	
5	58	
3.35	55	
2	51	
1.18	48	SAND
0.6	45	
0.425	43	
0.3	41	
0.15	37	SILT/CLAY
0.063	33	
0.038	28	
0.027	25	
0.017	23	
0.010	20	
0.007	18	
0.005	15	
0.002	12	

Contract No: 22150 Report No. R108655
 Contract: Liffey Park Technology Park
 BH/TP : TP08
 Sample No. AA116275 Lab. Sample No. A19/5966
 Sample Type: B
 Depth (m) 1.50 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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

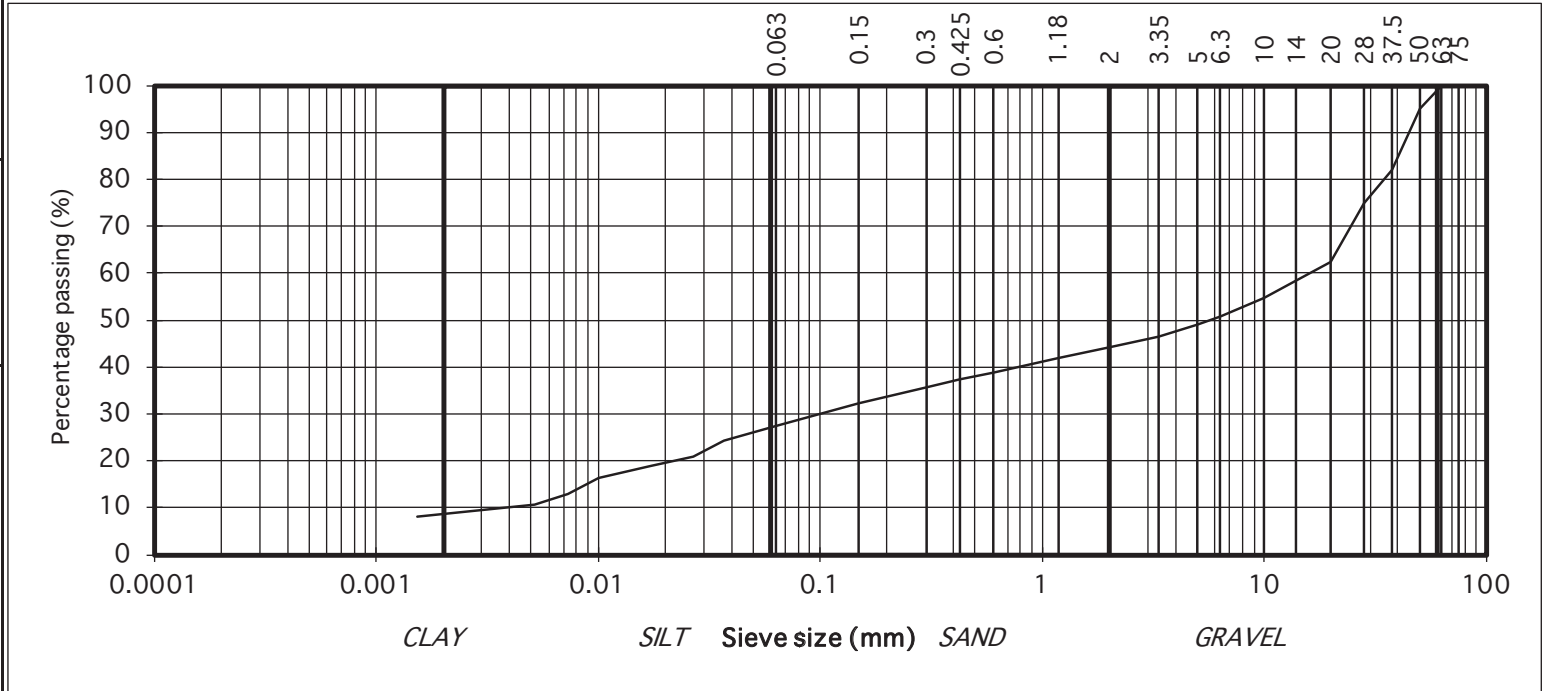


RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	95	
37.5	82	
28	75	
20	62	GRAVEL
14	58	
10	55	
6.3	51	
5	49	
3.35	47	SAND
2	44	
1.18	42	
0.6	39	
0.425	37	
0.3	36	SILT/CLAY
0.15	32	
0.063	27	
0.037	24	
0.027	21	
0.017	19	
0.010	16	
0.007	13	
0.005	11	
0.002	8	

Contract No: 22150 Report No. R108677
 Contract: Liffey Park Technology Park
 BH/TP : TP08
 Sample No. AA116277 Lab. Sample No. A19/5967
 Sample Type: B
 Depth (m) 2.30 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Dark brown slightly sandy, gravelly, CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



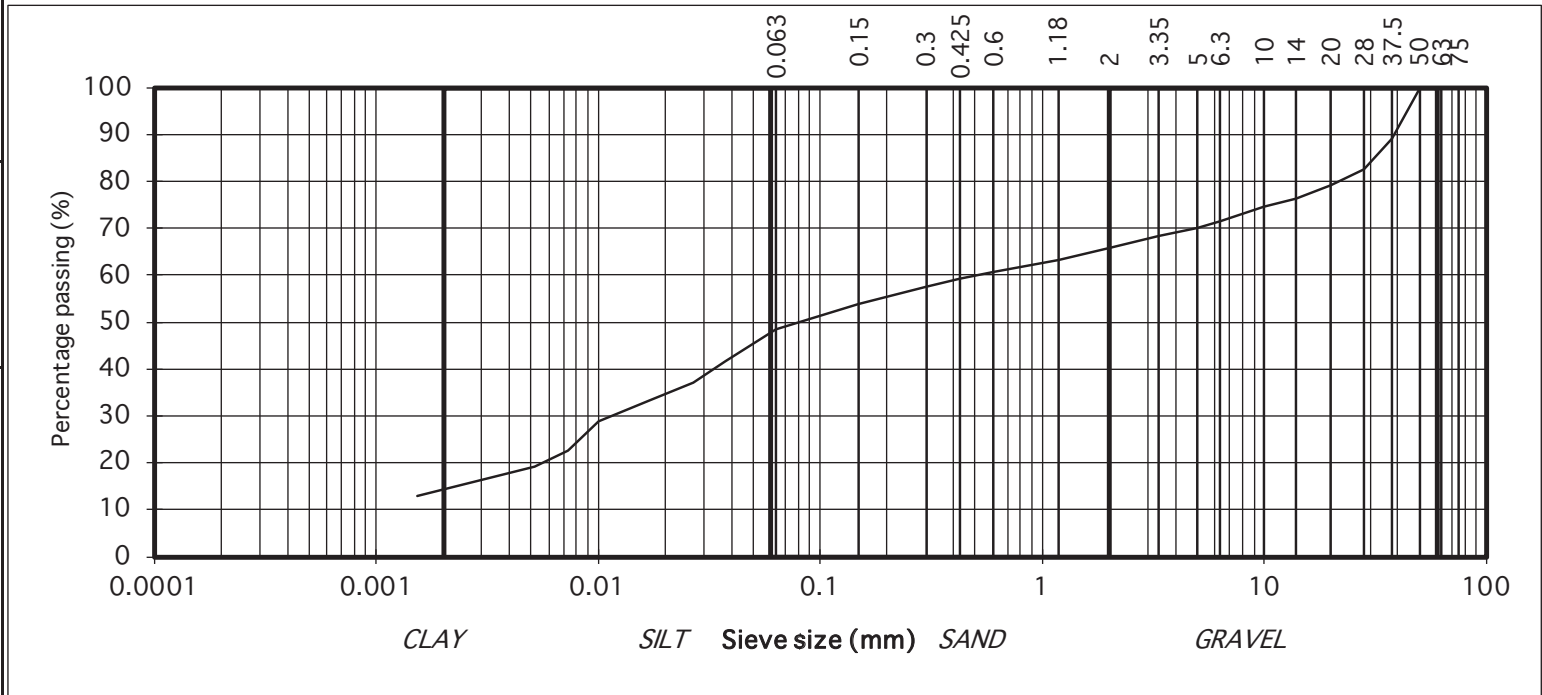
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	89	GRAVEL
28	83	
20	79	
14	76	
10	75	
6.3	71	
5	70	
3.35	68	
2	66	
1.18	63	
0.6	61	SAND
0.425	59	
0.3	58	
0.15	54	
0.063	49	SILT/CLAY
0.037	42	
0.027	37	
0.017	33	
0.010	29	
0.007	23	
0.005	19	
0.002	13	

Contract No: 22150 Report No. R108678
 Contract: Liffey Park Technology Park
 BH/TP : TP10
 Sample No. AA118606 Lab. Sample No. A19/5970
 Sample Type: B
 Depth (m) 0.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377: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:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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

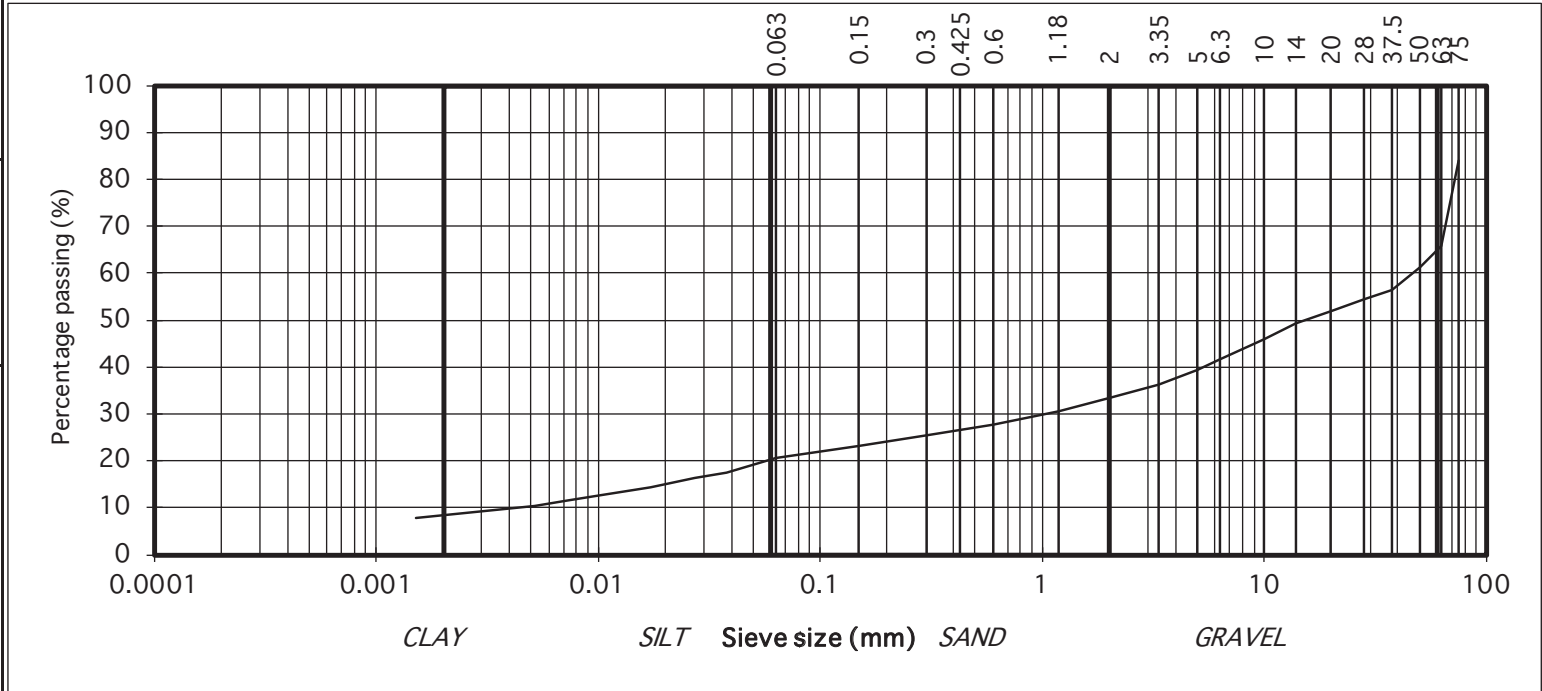


RECEIVED: 18/07/2023

particle size	% passing	
75	84	COBBLES
63	66	
50	61	
37.5	56	
28	54	
20	52	GRAVEL
14	49	
10	46	
6.3	42	
5	39	
3.35	36	SAND
2	33	
1.18	31	
0.6	28	
0.425	26	
0.3	25	SILT/CLAY
0.15	23	
0.063	20	
0.038	18	
0.027	16	
0.017	14	
0.010	13	
0.007	12	
0.005	10	
0.002	8	

Contract No: 22150 Report No. R108679
 Contract: Liffey Park Technology Park
 BH/TP : TP10
 Sample No. AA118607 Lab. Sample No. A19/5971
 Sample Type: B
 Depth (m) 1.60 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, gravelly, CLAY with many cobbles

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377: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



TEST REPORT

Determination of Particle Size Distribution

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



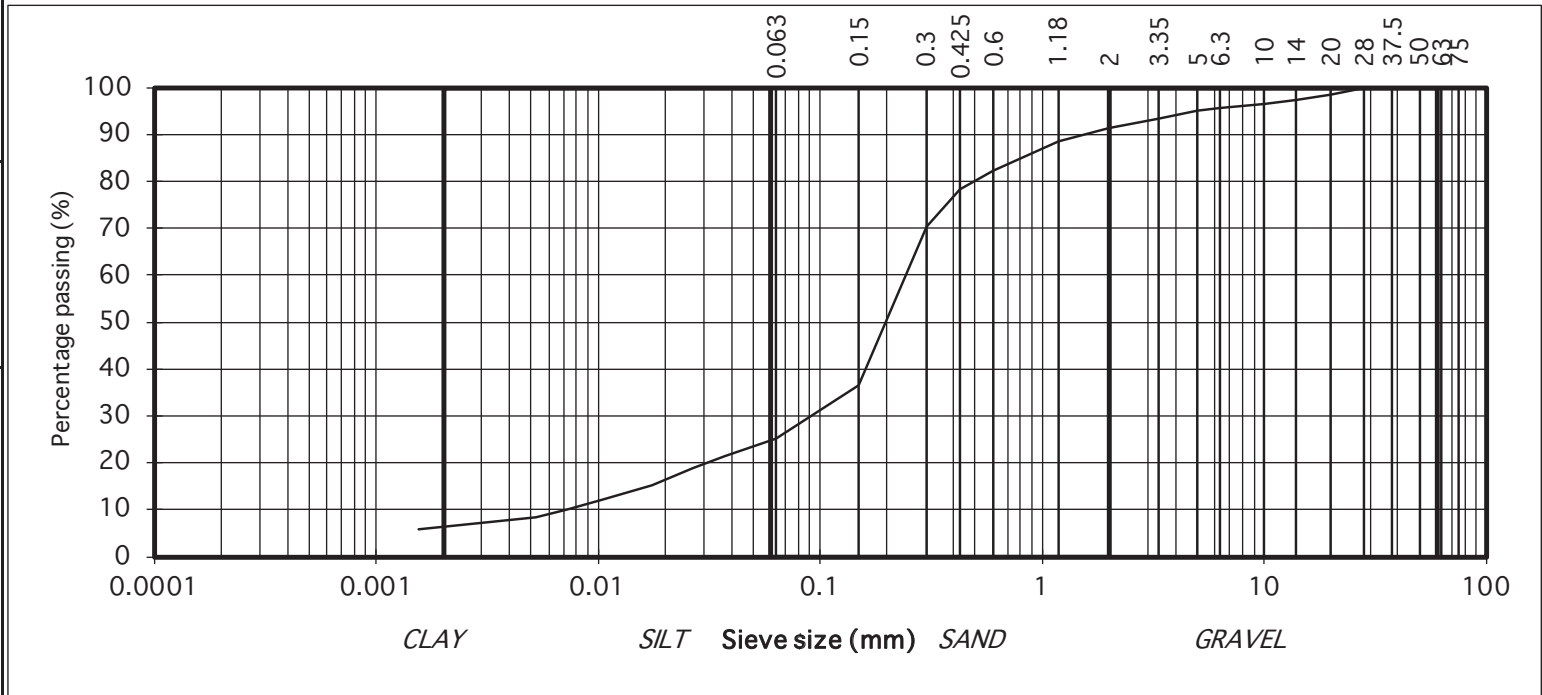
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	99	GRAVEL
14	97	
10	96	
6.3	96	
5	95	
3.35	94	
2	91	
1.18	89	SAND
0.6	82	
0.425	78	
0.3	71	
0.15	36	
0.063	25	SILT/CLAY
0.037	21	
0.027	19	
0.017	15	
0.010	12	
0.007	10	
0.005	8	
0.002	6	

Contract No: 22150 Report No. R108922
 Contract: Liffey Park Technology Park
 BH/TP : TP11
 Sample No. AA118616 Lab. Sample No. A19/5972
 Sample Type: B
 Depth (m) 1.50 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 17/01/2020
 Description: Brown very sandy, slightly gravelly, SILT/CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



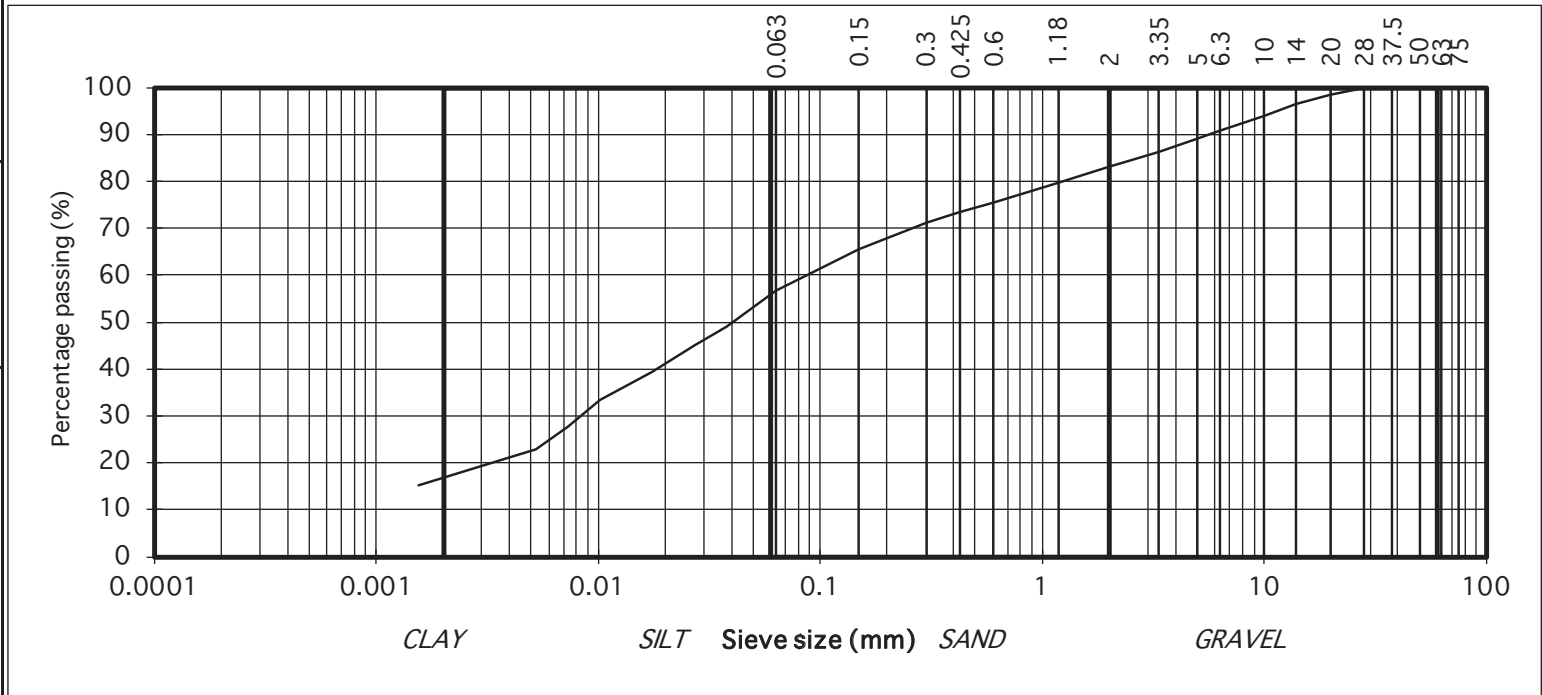
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	99	GRAVEL
14	97	
10	94	
6.3	91	
5	89	
3.35	86	
2	83	
1.18	80	SAND
0.6	76	
0.425	74	
0.3	71	
0.15	65	
0.063	57	SILT/CLAY
0.038	49	
0.027	45	
0.017	39	
0.010	33	
0.007	28	
0.005	23	
0.002	15	

Contract No: 22150 Report No. R108715
 Contract: Liffey Park Technology Park
 BH/TP : TPSA01
 Sample No. AA128608 Lab. Sample No. A19/5975
 Sample Type: B
 Depth (m) 1.50 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Mottled brown slightly sandy, slightly gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



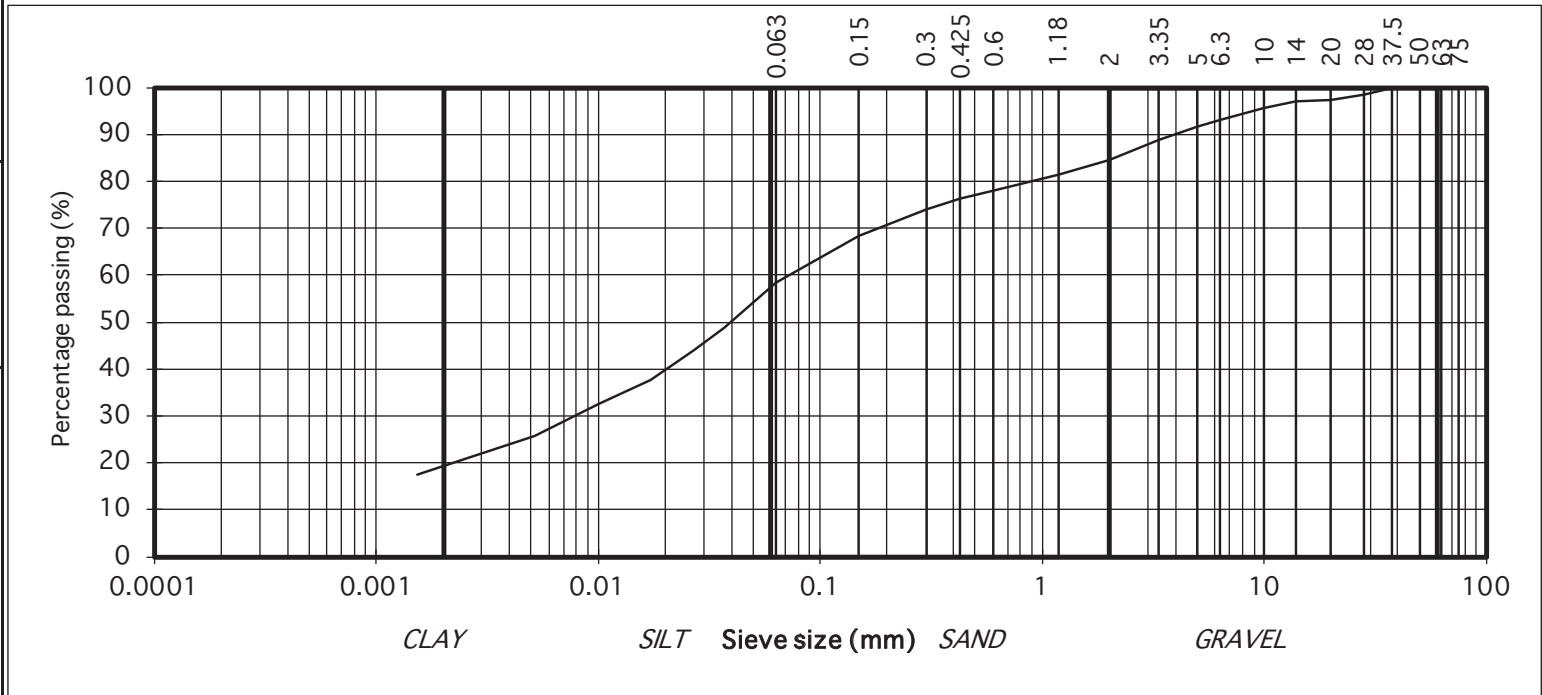
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	98	GRAVEL
20	97	
14	97	
10	96	
6.3	93	
5	92	
3.35	89	
2	85	SAND
1.18	81	
0.6	78	
0.425	76	
0.3	74	SILT/CLAY
0.15	68	
0.063	58	
0.037	49	
0.027	44	
0.017	38	
0.010	32	
0.007	29	
0.005	26	
0.002	17	

Contract No: 22150 Report No. R108680
 Contract: Liffey Park Technology Park
 BH/TP : TPSA01
 Sample No. AA128606 Lab. Sample No. A19/5974
 Sample Type: B
 Depth (m) 0.50 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



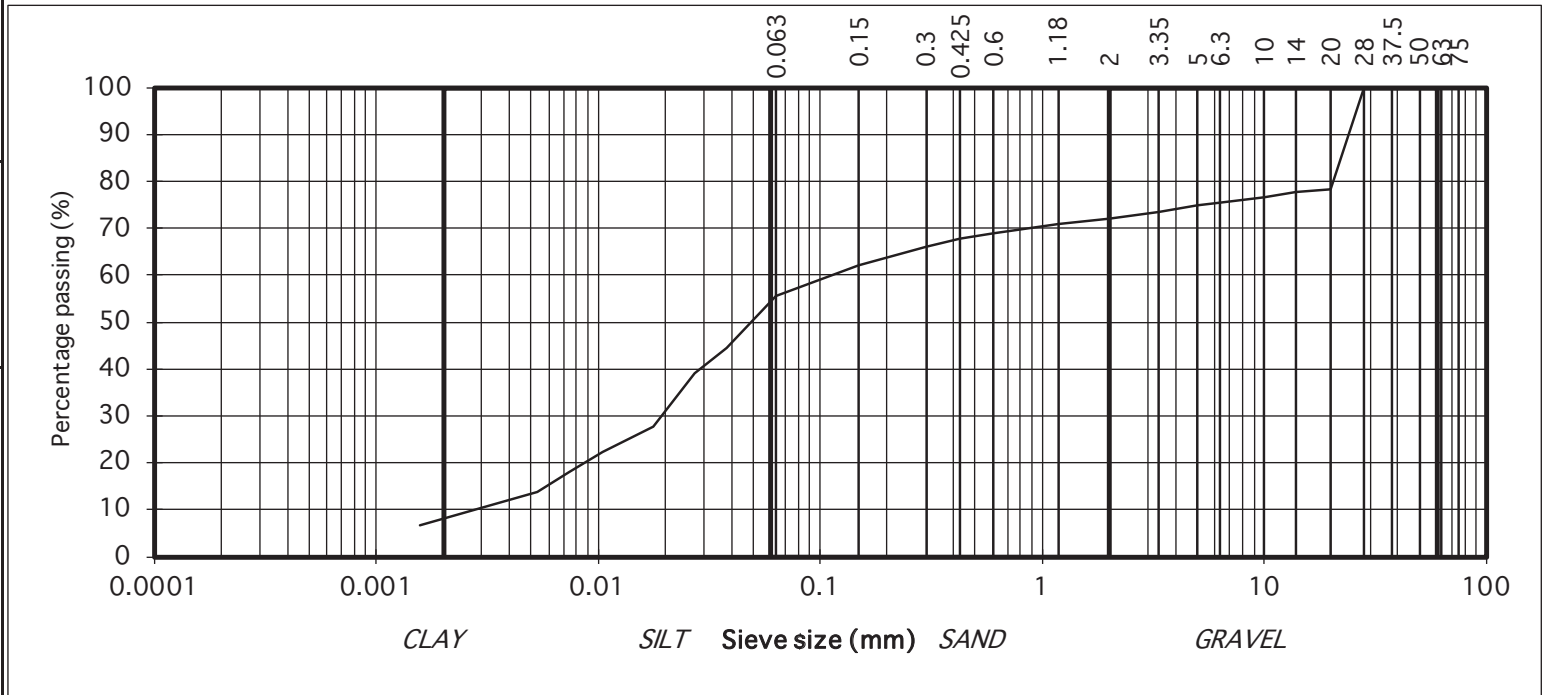
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	100	
28	100	
20	78	GRAVEL
14	78	
10	77	
6.3	76	
5	75	
3.35	74	SAND
2	72	
1.18	71	
0.6	69	
0.425	68	
0.3	66	SILT/CLAY
0.15	62	
0.063	56	
0.038	44	
0.027	39	
0.018	28	
0.010	22	
0.007	18	
0.005	14	
0.002	7	

Contract No: 22150 Report No. R108681
 Contract: Liffey Park Technology Park
 BH/TP : TPSA02
 Sample No. AA118610 Lab. Sample No. A19/5976
 Sample Type: B
 Depth (m) 1.30 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, slightly gravelly, SILT

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377: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:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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

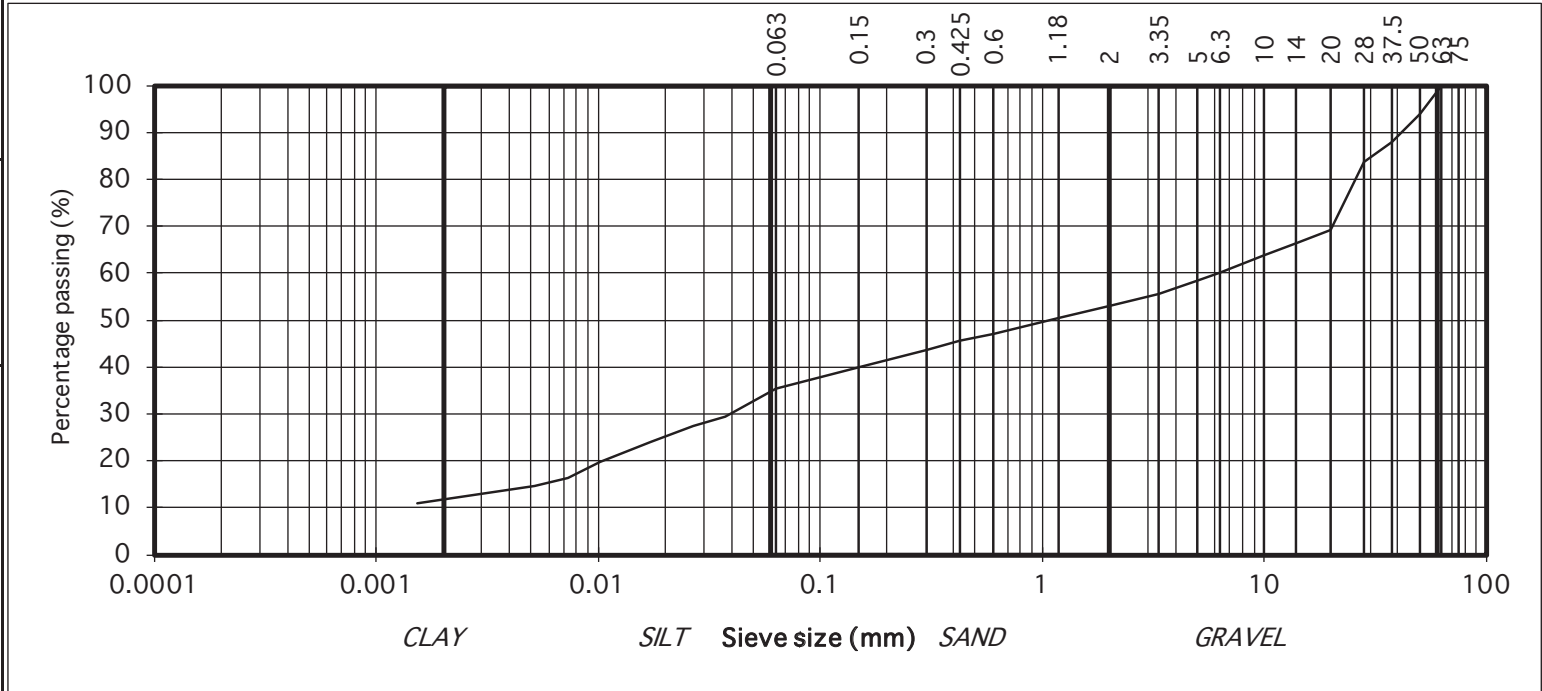


RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	94	
37.5	88	GRAVEL
28	84	
20	69	
14	67	
10	64	
6.3	60	
5	58	
3.35	56	
2	53	
1.18	51	
0.6	47	SAND
0.425	46	
0.3	44	
0.15	40	SILT/CLAY
0.063	35	
0.037	29	
0.027	27	
0.017	24	
0.010	20	
0.007	16	
0.005	15	
0.002	11	

Contract No: 22150 Report No. R108682
 Contract: Liffey Park Technology Park
 BH/TP : TPSA02
 Sample No. AA118611 Lab. Sample No. A19/5977
 Sample Type: B
 Depth (m) 1.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



TEST REPORT

Determination of Particle Size Distribution

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

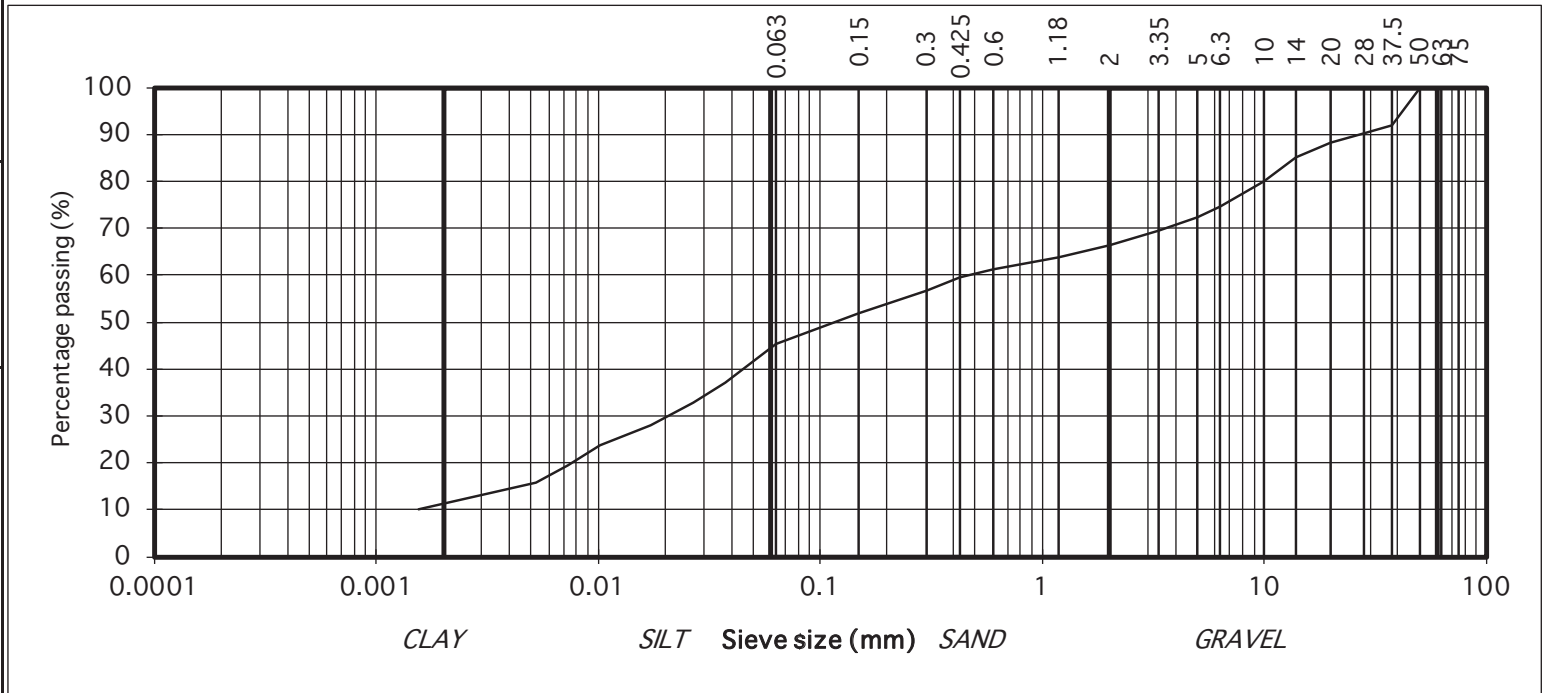


RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	92	
28	90	
20	88	GRAVEL
14	85	
10	80	
6.3	75	
5	72	
3.35	69	
2	66	
1.18	64	SAND
0.6	61	
0.425	60	
0.3	57	
0.15	52	
0.063	45	SILT/CLAY
0.037	37	
0.027	33	
0.017	28	
0.010	24	
0.007	20	
0.005	16	
0.002	10	

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
 Depth (m) 0.80 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, slightly gravelly, CLAY

Remarks Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



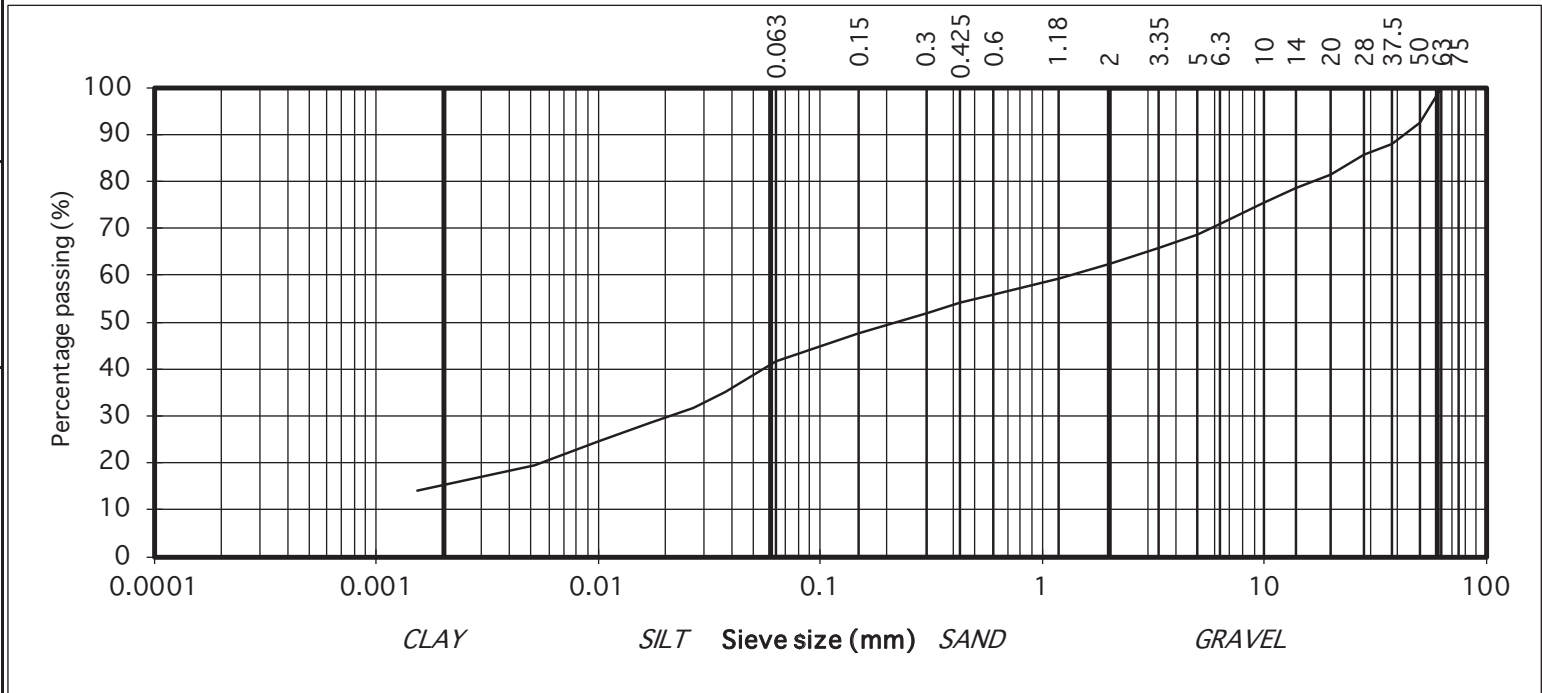
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	93	
37.5	88	GRAVEL
28	86	
20	81	
14	79	
10	75	
6.3	71	
5	69	
3.35	66	
2	62	
1.18	59	
0.6	56	
0.425	54	
0.3	52	
0.15	48	SILT/CLAY
0.063	42	
0.037	35	
0.027	32	
0.017	29	
0.010	25	
0.007	22	
0.005	19	
0.002	14	

Contract No: 22150 Report No. R108717
 Contract: Liffey Park Technology Park
 BH/TP : TPSA03
 Sample No. AA118603 Lab. Sample No. A19/5979
 Sample Type: B
 Depth (m) 1.70 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



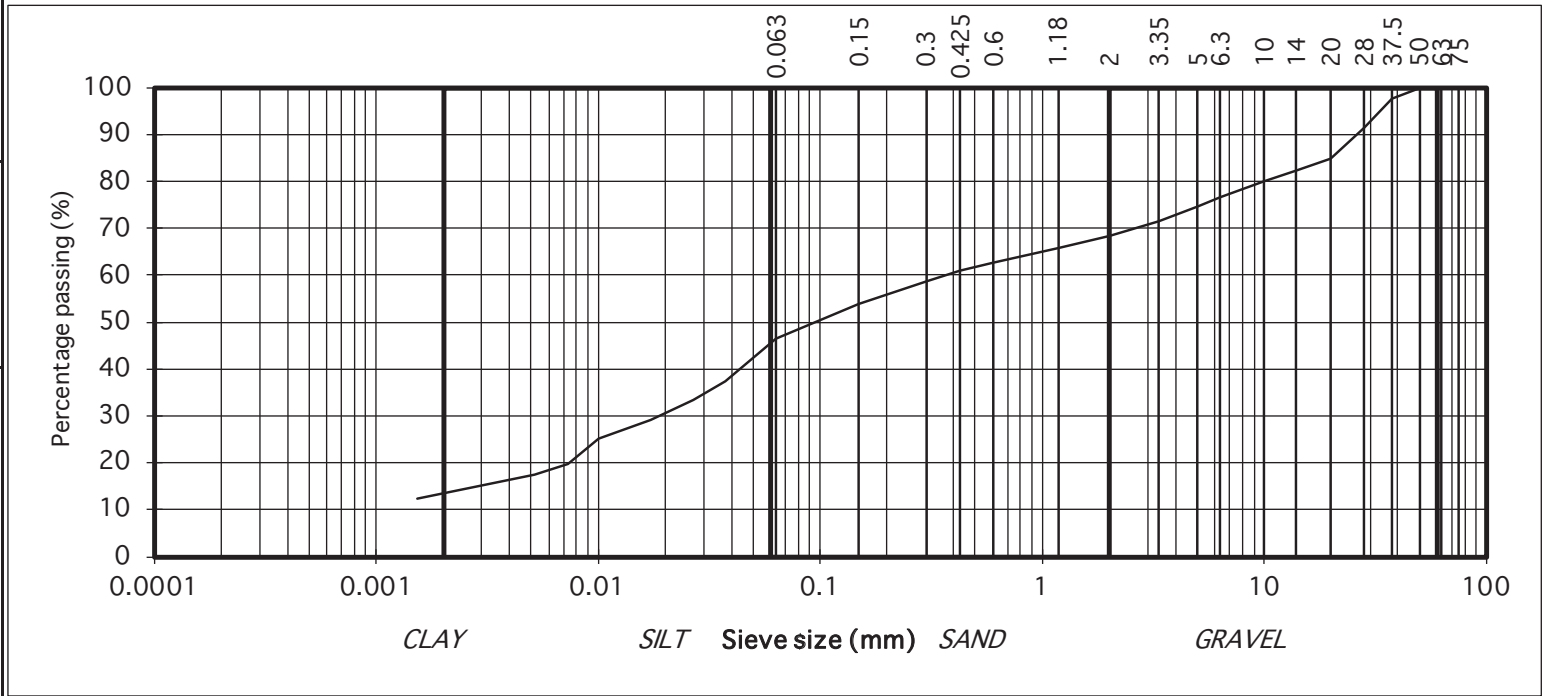
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	100	
37.5	98	
28	91	
20	85	GRAVEL
14	82	
10	80	
6.3	77	
5	75	
3.35	72	
2	68	
1.18	66	SAND
0.6	63	
0.425	61	
0.3	59	
0.15	54	
0.063	46	SILT/CLAY
0.037	37	
0.027	33	
0.017	29	
0.010	25	
0.007	20	
0.005	18	
0.002	13	

Contract No: 22150 Report No. R108683
 Contract: Liffey Park Technology Park
 BH/TP : TPSA04
 Sample No. AA128602 Lab. Sample No. A19/5980
 Sample Type: B
 Depth (m) 0.60 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Brown slightly sandy, slightly gravelly, SILT/CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



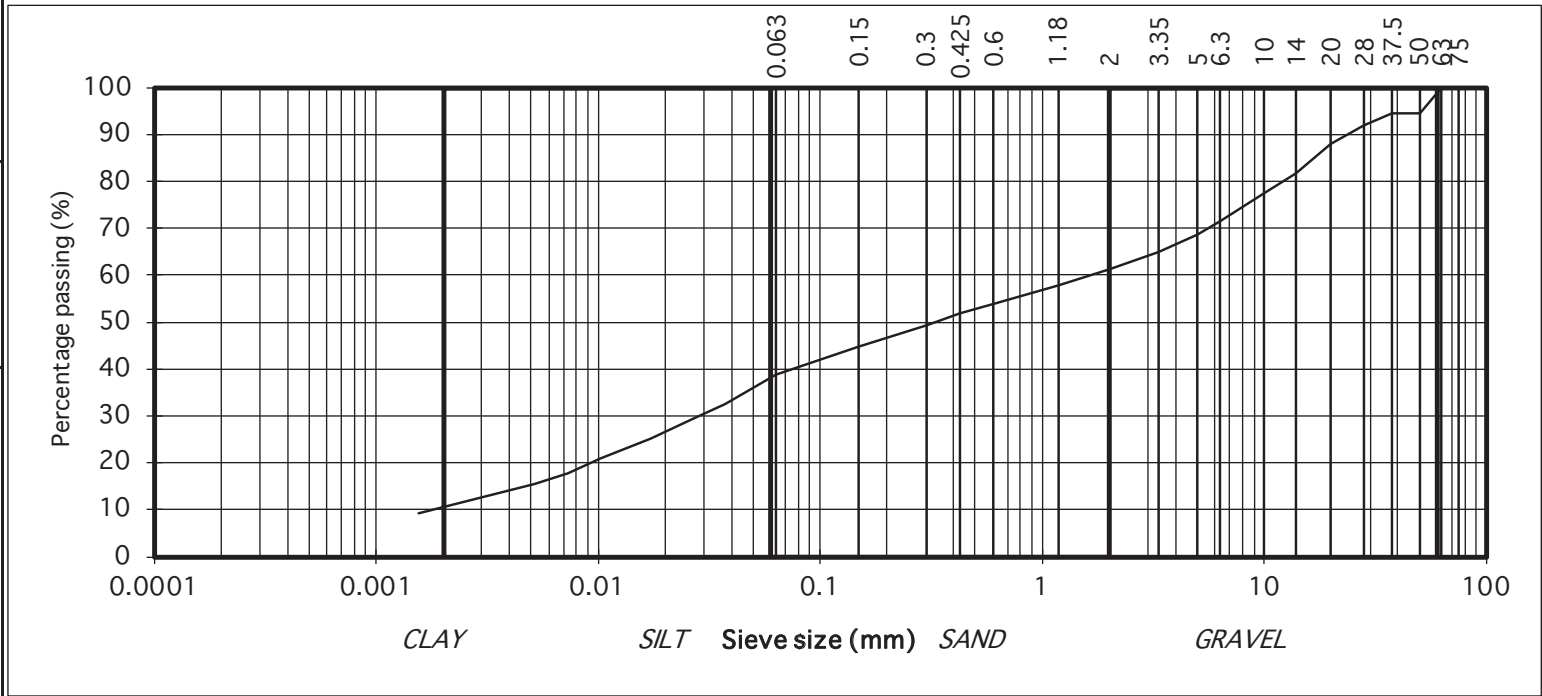
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	95	
37.5	95	GRAVEL
28	92	
20	88	
14	82	
10	77	
6.3	72	
5	69	
3.35	65	
2	61	
1.18	58	
0.6	54	SAND
0.425	52	
0.3	49	
0.15	45	SILT/CLAY
0.063	39	
0.037	33	
0.027	29	
0.017	25	
0.010	21	
0.007	18	
0.005	15	
0.002	9	

Contract No: 22150 Report No. R108718
 Contract: Liffey Park Technology Park
 BH/TP : TPSA04
 Sample No. AA128604 Lab. Sample No. A19/5981
 Sample Type: B
 Depth (m) 2.20 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 10/01/2020
 Description: Brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

TEST REPORT

Determination of Particle Size Distribution

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



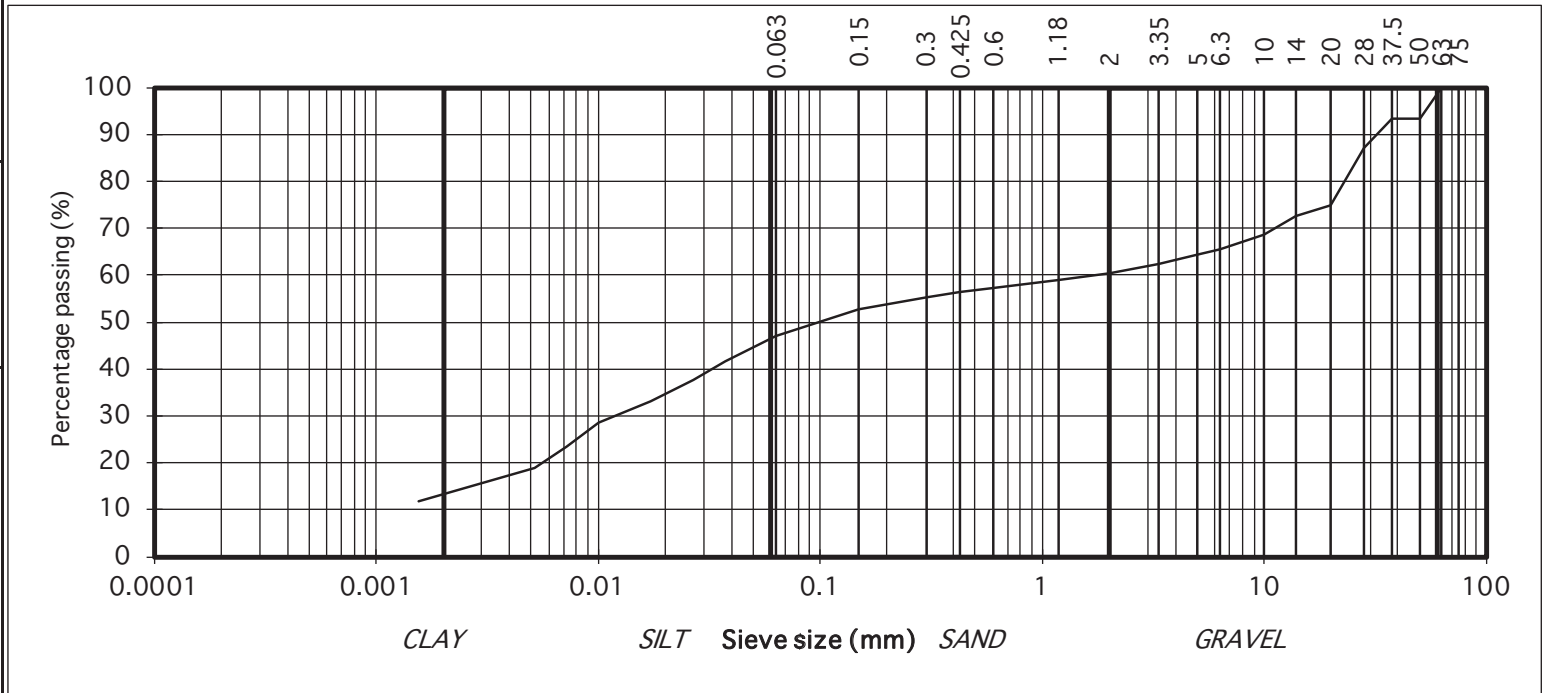
RECEIVED: 18/07/2023

particle size	% passing	
75	100	COBBLES
63	100	
50	93	
37.5	93	GRAVEL
28	87	
20	75	
14	73	
10	69	
6.3	66	
5	64	
3.35	62	
2	61	
1.18	59	
0.6	57	SAND
0.425	56	
0.3	55	
0.15	53	SILT/CLAY
0.063	47	
0.037	42	
0.027	38	
0.017	33	
0.010	28	
0.007	23	
0.005	19	
0.002	12	

Contract No: 22150 Report No. R108684
 Contract: Liffey Park Technology Park
 BH/TP : TPSA04
 Sample No. AA128605 Lab. Sample No. A19/5982
 Sample Type: B
 Depth (m) 2.60 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received 09/01/2020 Date Testing started 09/01/2020
 Description: Dark brown slightly sandy, gravelly, CLAY

Remarks

Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 . Results apply to sample as received.



IGSL Ltd Materials Laboratory	Approved by:	Date:	Page no:
	<i>H Byrne</i>	24/01/20	1 of 1

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

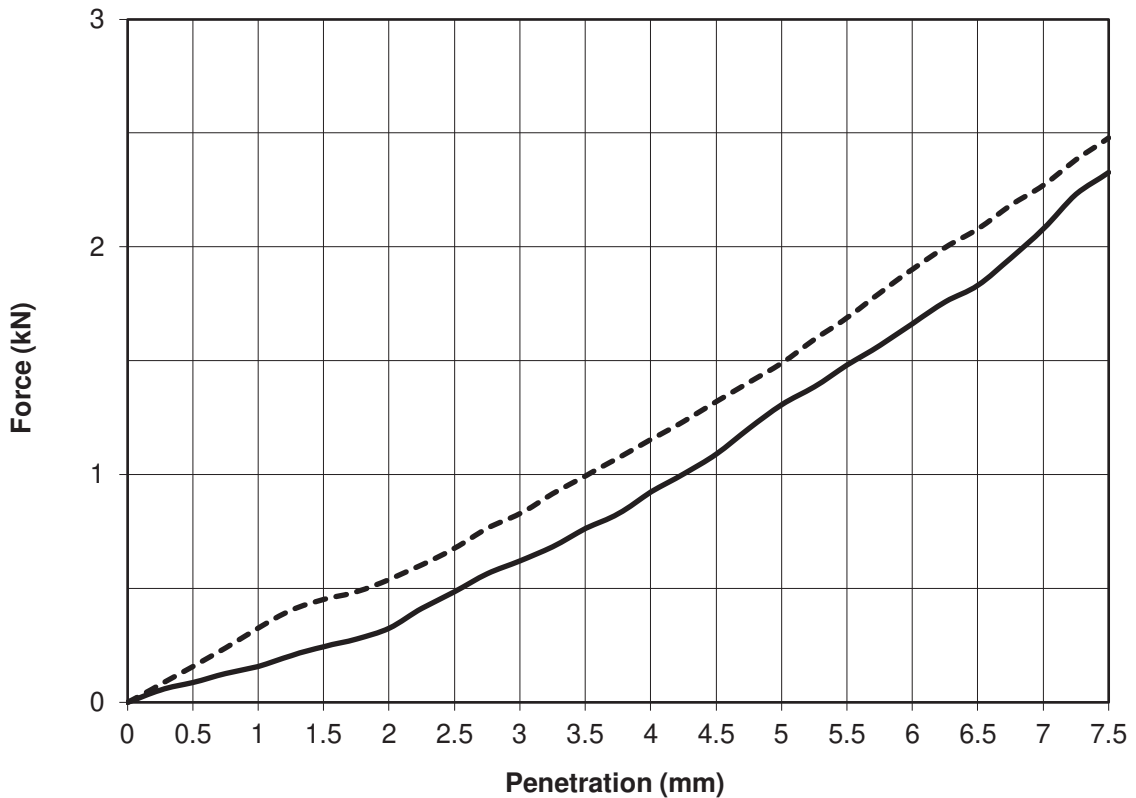
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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: ————— Top - - - - - Base

Description: Dark grey sandy gravelly CLAY			
Initial Condition:		Unsoaked Point 4	
Moisture Content (%):	11	Bulk Density (Mg/m ³):	2.22
Surcharge (kg):	4	Dry Density (Mg/m ³):	2.00
% Material >20mm:	41		
Method of compaction: Static Compaction Method 2			

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

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

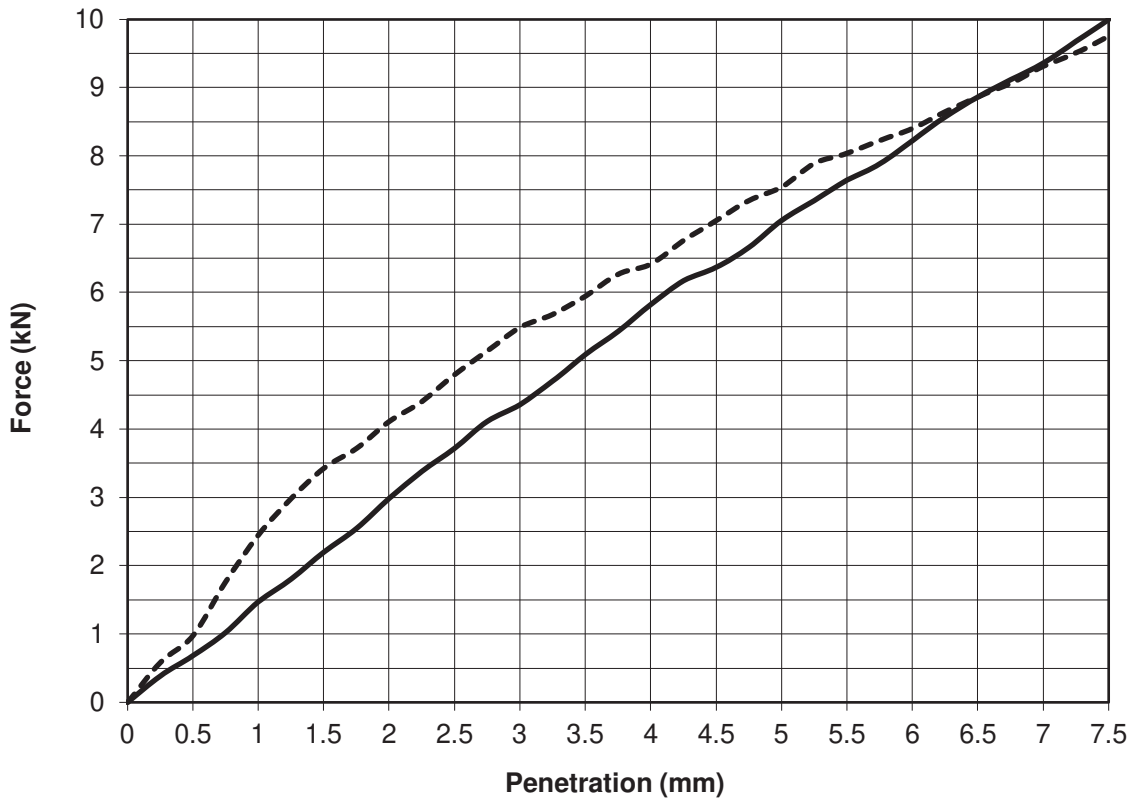
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108857	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: ————— Top - - - - - Base

Description: Dark grey sandy gravelly CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	35	38
Moisture Content %	9	9

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

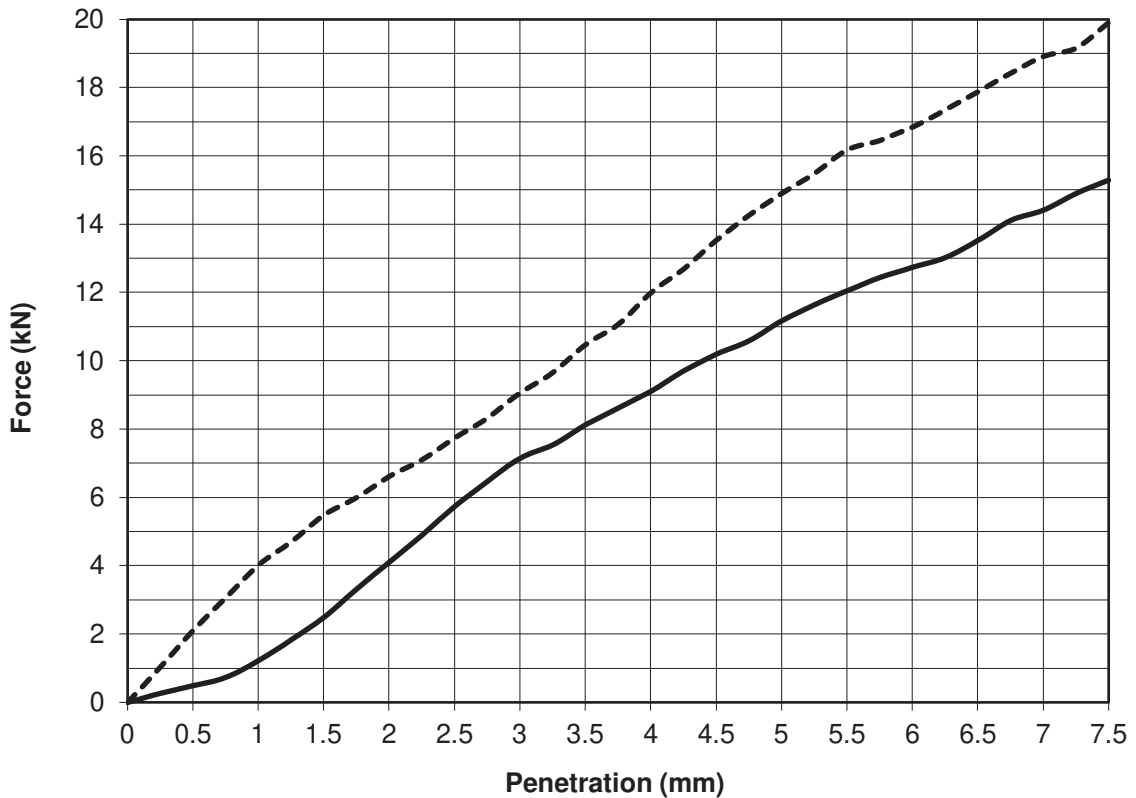
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108858	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: ————— Top - - - - - Base

Description: Dark grey sandy gravelly CLAY			
Initial Condition:		Unsoaked Point 2	
Moisture Content (%):	7	Bulk Density (Mg/m ³):	2.14
Surcharge (kg):	4	Dry Density (Mg/m ³):	2.00
% Material >20mm:	41		
Method of compaction: Static Compaction Method 2			

Test Result	Top	Base
CBR %	56	75
Moisture Content %	7	7

Persons authorized to approve reports

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

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

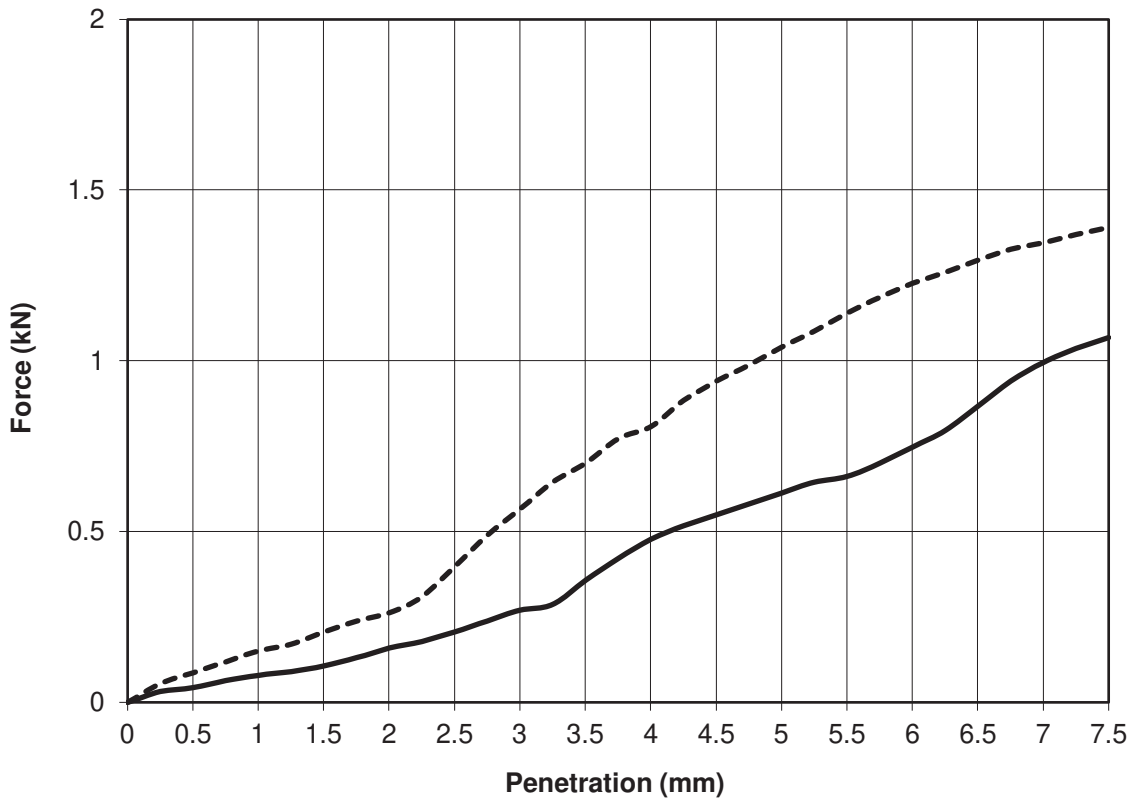
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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

Description: Dark grey sandy gravelly CLAY			
Initial Condition: Unsoaked Natural Point 1			
Moisture Content (%):	13	Bulk Density (Mg/m ³):	2.22
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.97
% Material >20mm:	41		
Method of compaction: Static Compaction Method 2			

Test Result	Top	Base
CBR %	3.1	5.2
Moisture Content %	13	13

Results apply to sample as received.

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

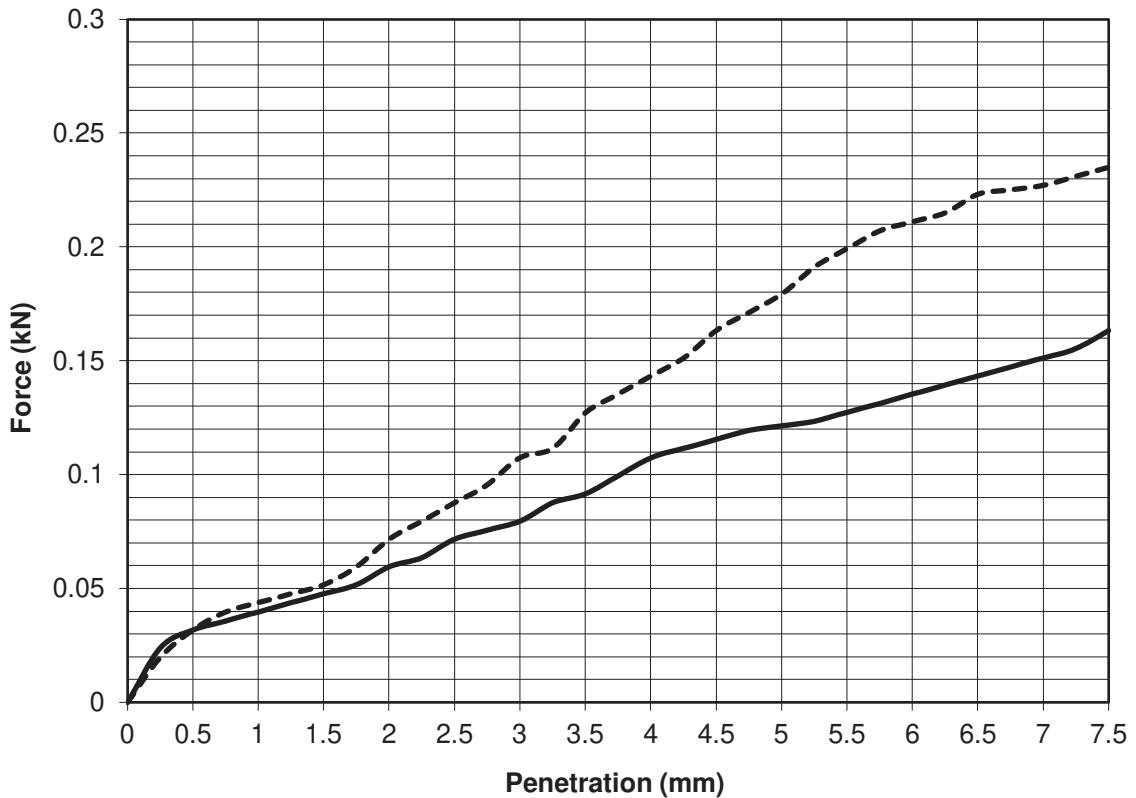
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108860	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: ————— Top - - - - - Base

Description: Dark grey sandy gravelly CLAY			
Initial Condition:		Unsoaked Point 5	
Moisture Content (%):	15	Bulk Density (Mg/m ³):	2.24
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.95
% Material >20mm:	41		
Method of compaction: Static Compaction Method 2			

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

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

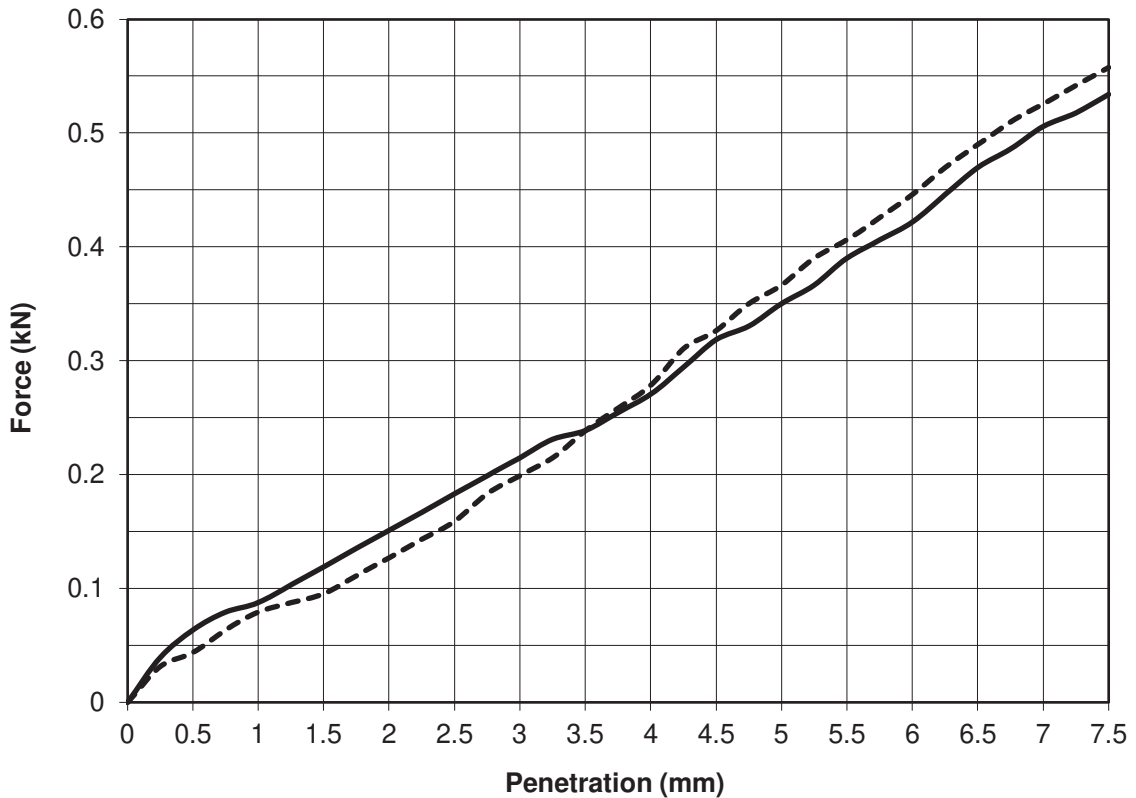
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108862	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.	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 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 Compaction Method 2	

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

Results apply to sample as received.

Persons authorized to approve reports

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

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

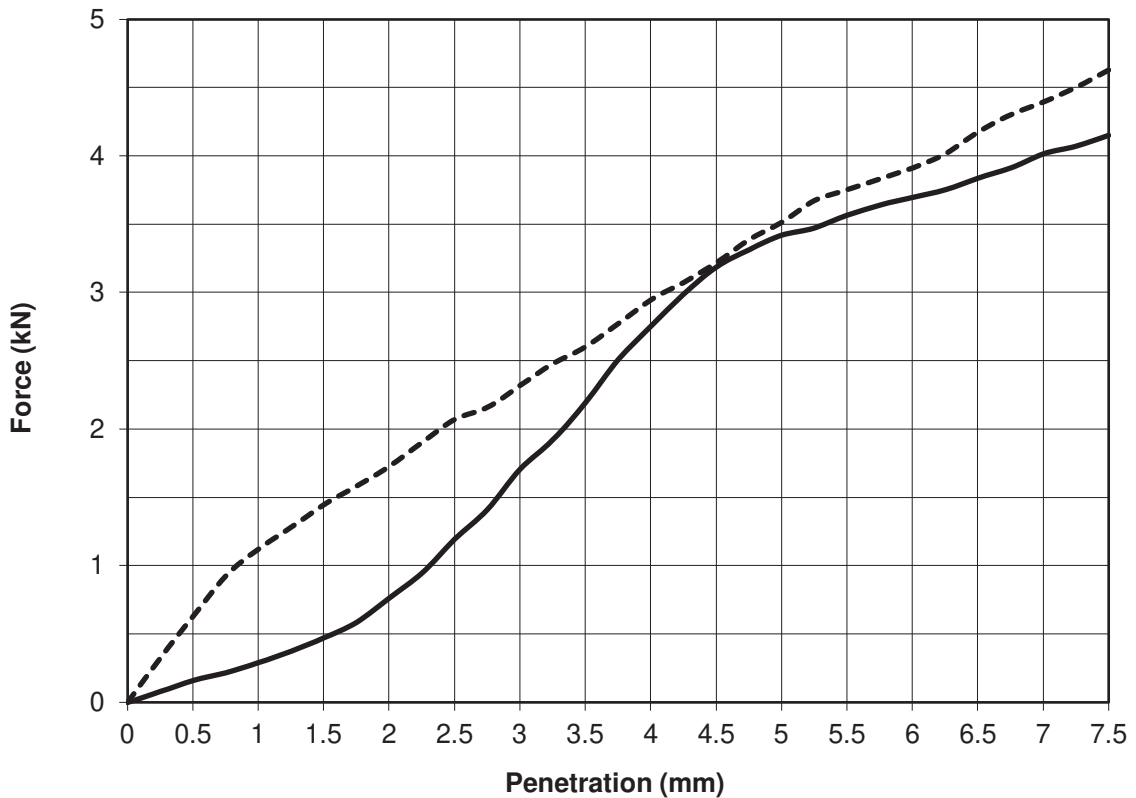
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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



Key: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	17	18
Moisture Content %	9	9

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

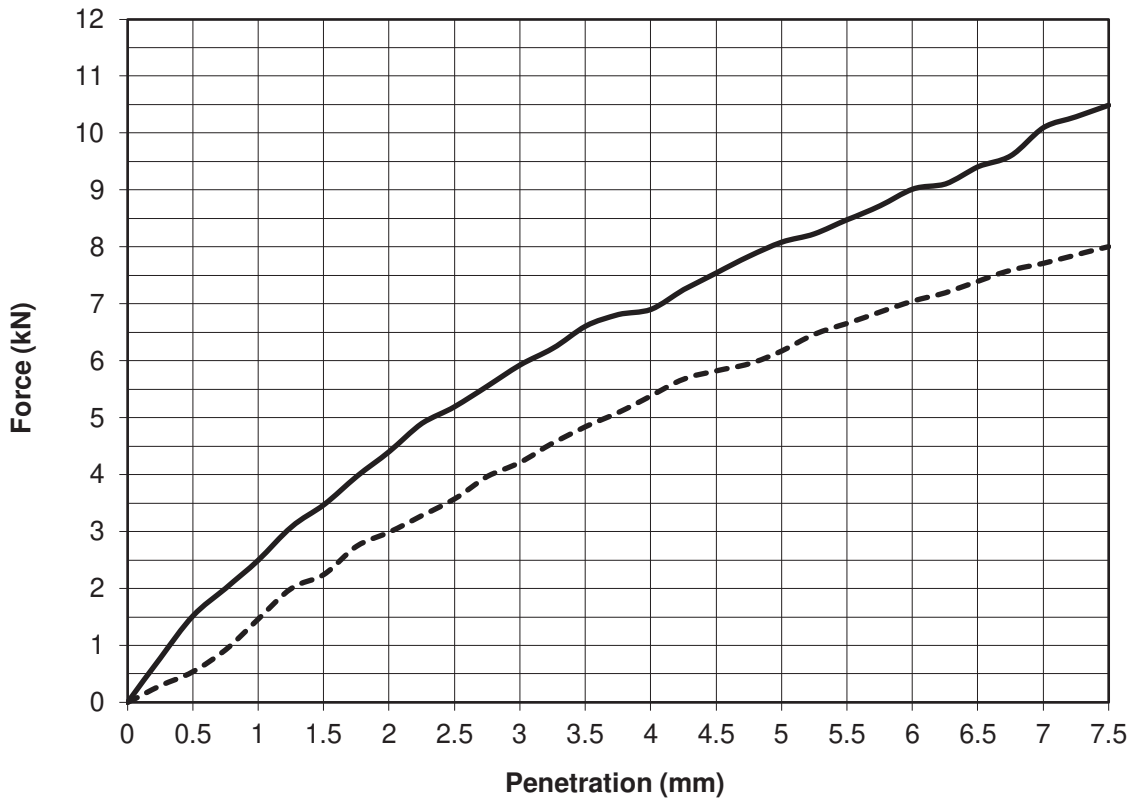
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108864	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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked Point 4	
Moisture Content (%):	8	Bulk Density (Mg/m ³):	2.10
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.94
% Material >20mm:	11.6		
Method of compaction: Static Compaction Method 2			

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

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

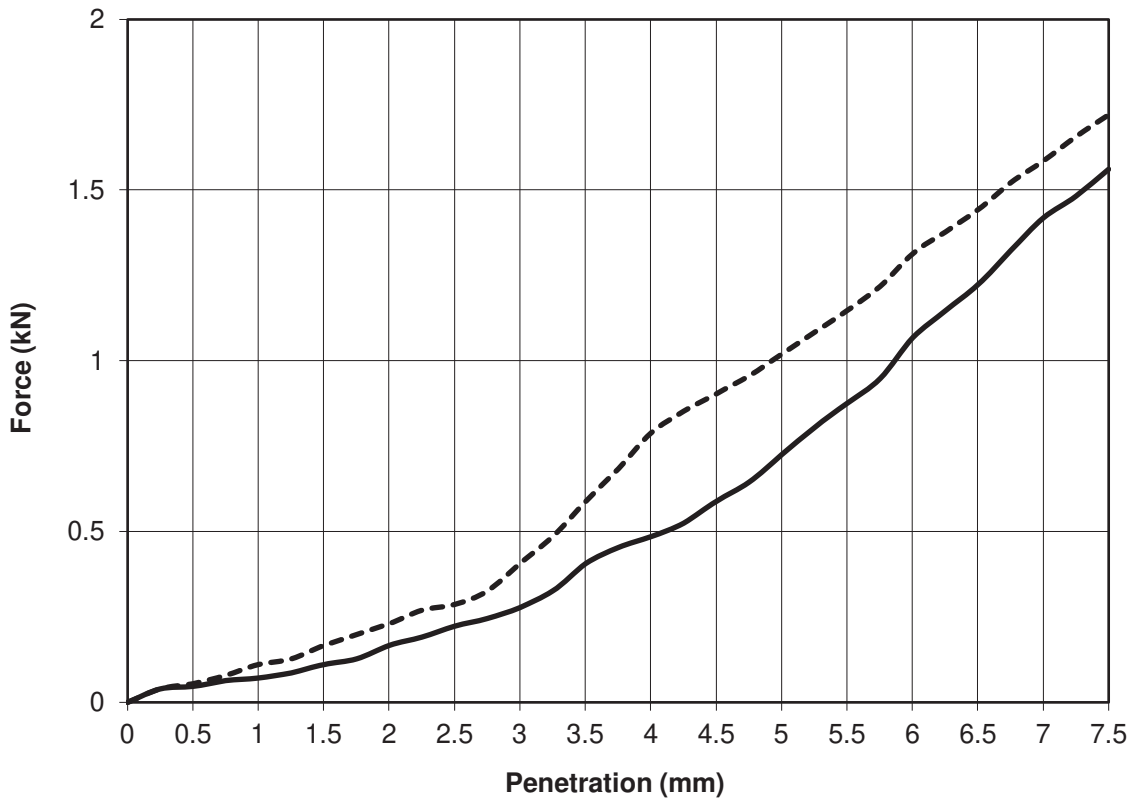
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2	

Test Result	Top	Base
CBR %	3.6	5.1
Moisture Content %	11	11

Persons authorized to approve reports
J Barrett (Quality Manager)
H Byrne (Laboratory Manager)

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

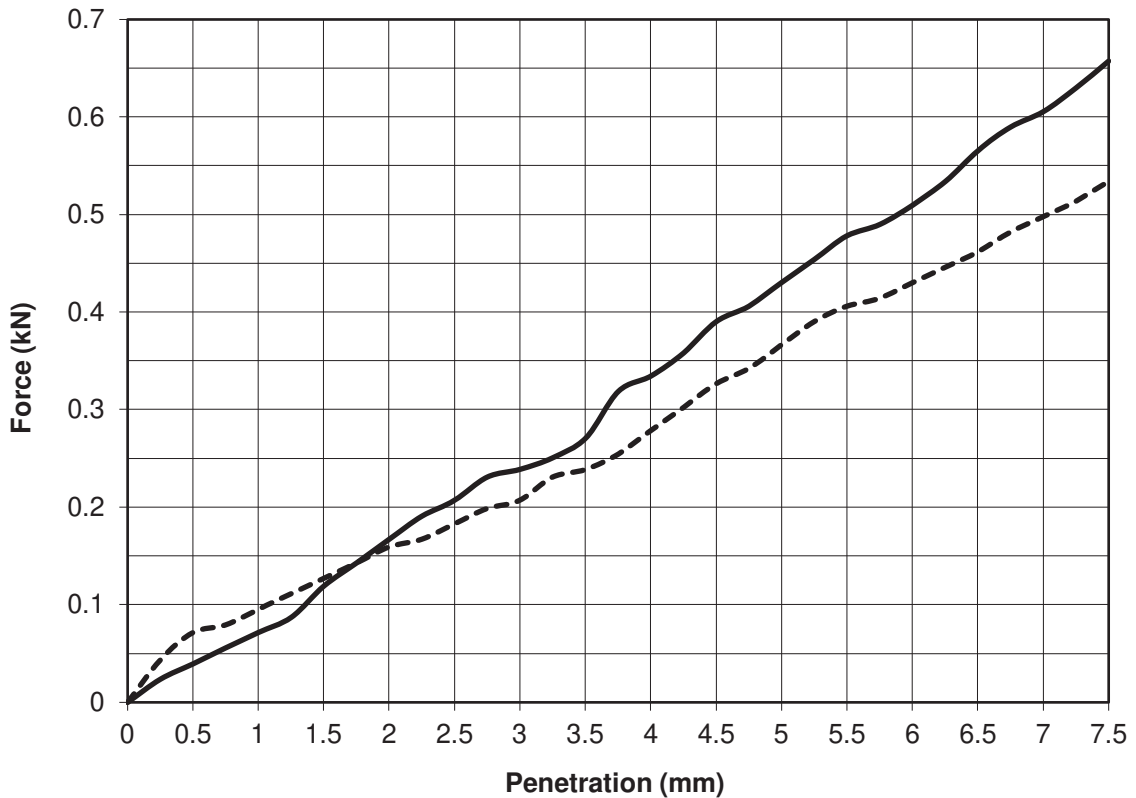
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108866	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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	2.2	1.8
Moisture Content %	12	12

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

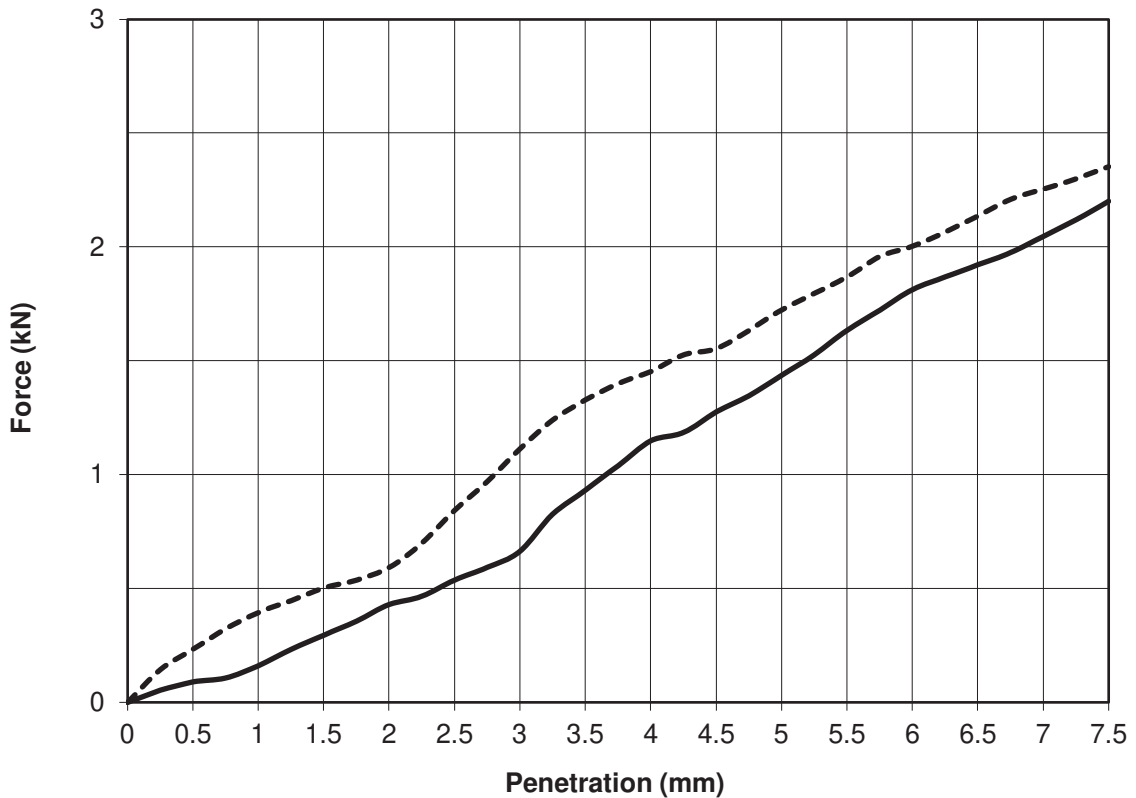
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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 slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2	

Test Result	Top	Base
CBR %	7	9
Moisture Content %	17	17

Persons authorized to approve reports

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

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

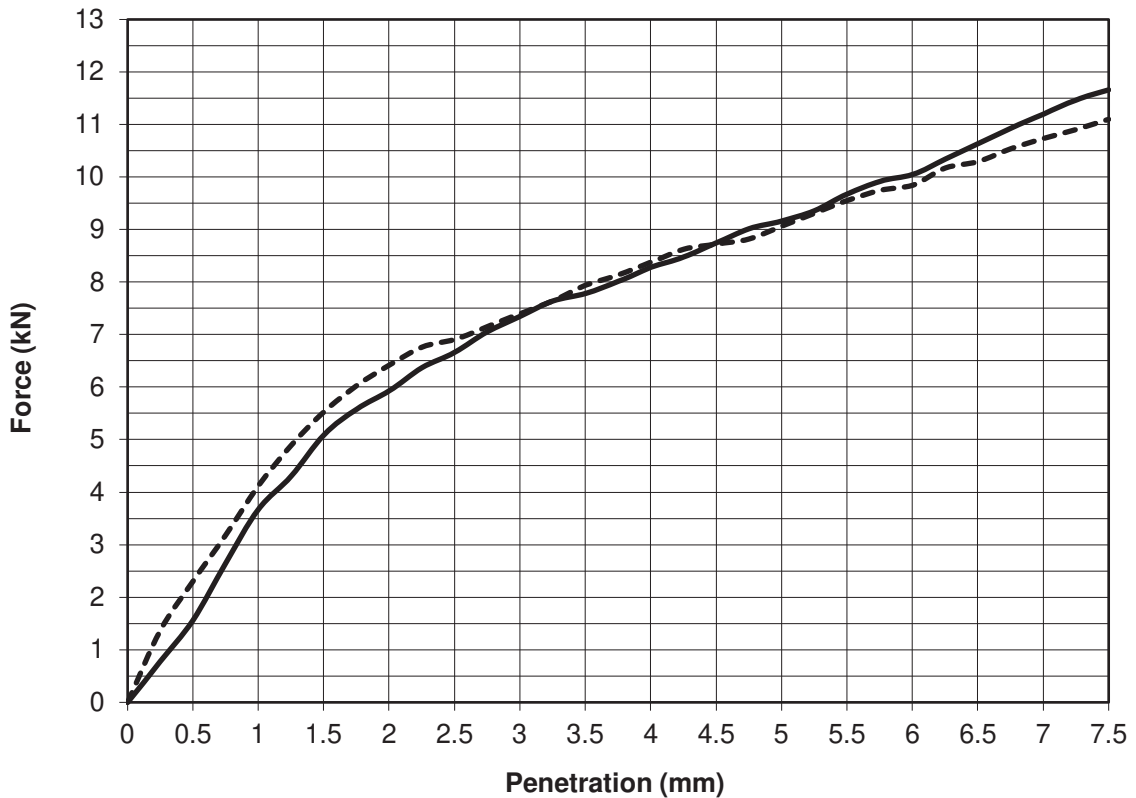
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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 slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	50	52
Moisture Content %	8	8

Persons authorized to approve reports

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

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
	24/01/20	1 of 1

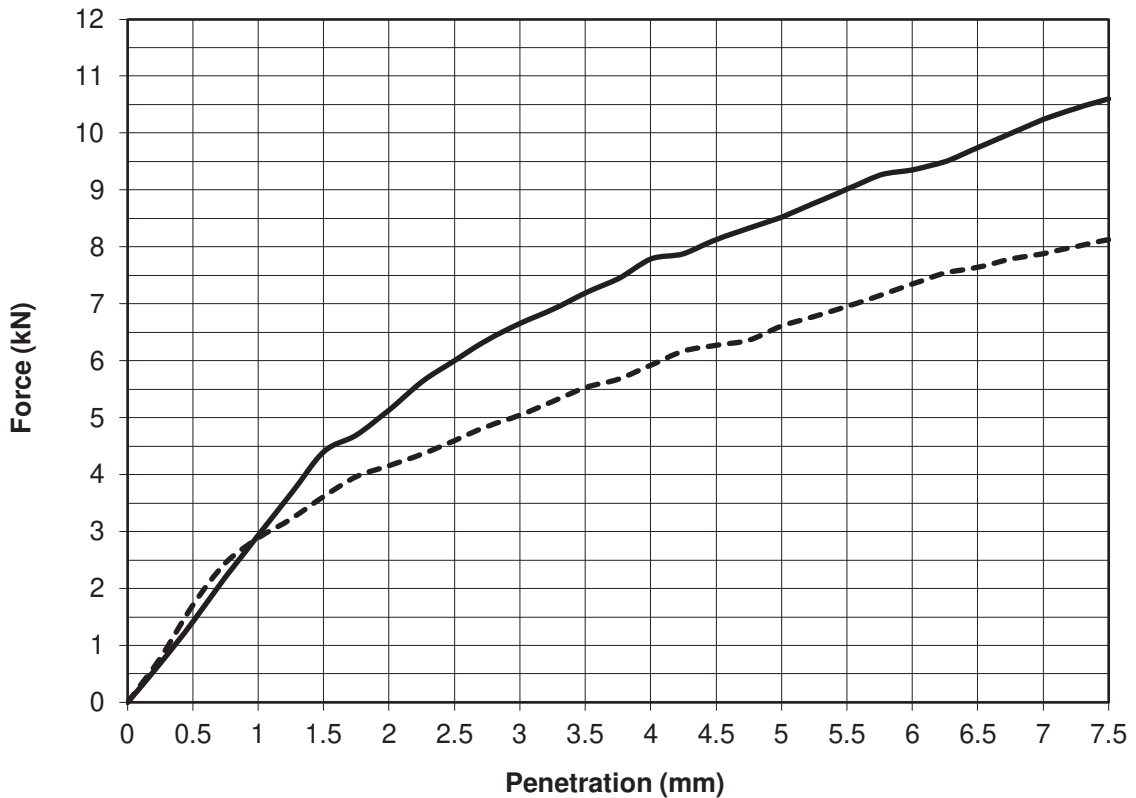
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108740	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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2	

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

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

TEST REPORT

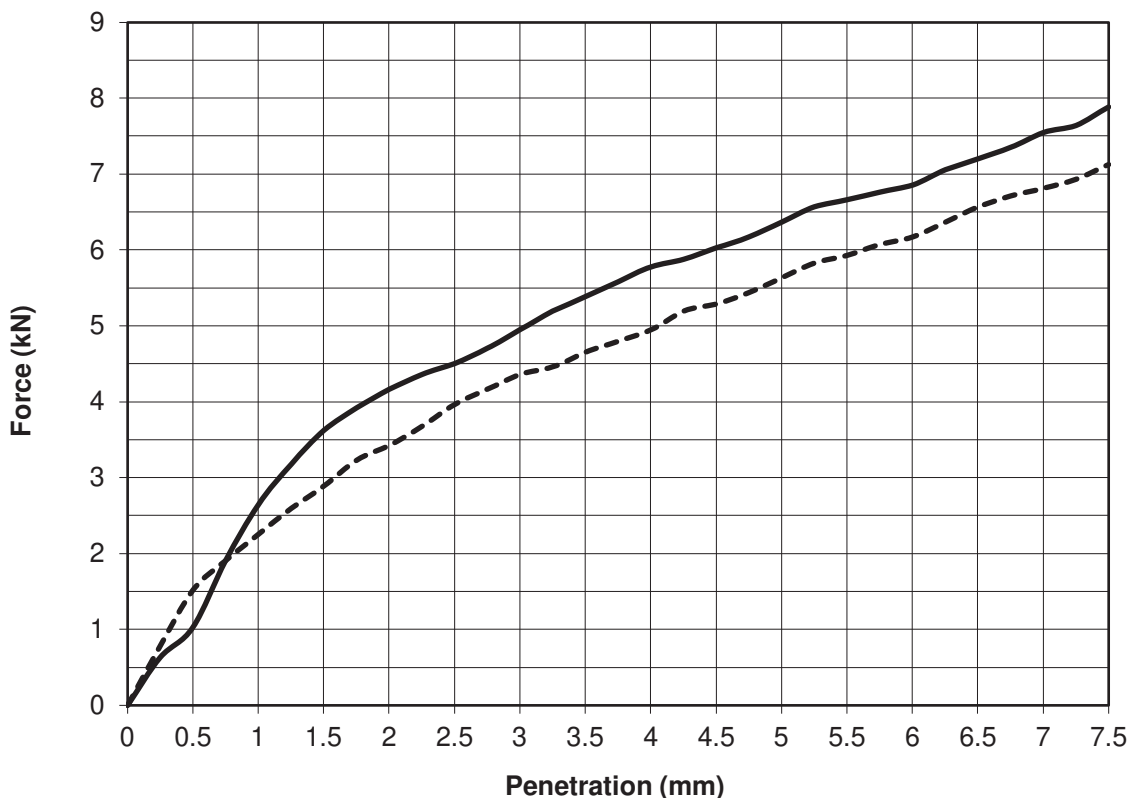
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108741	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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	34	30
Moisture Content %	12	12

Persons authorized to approve reports

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

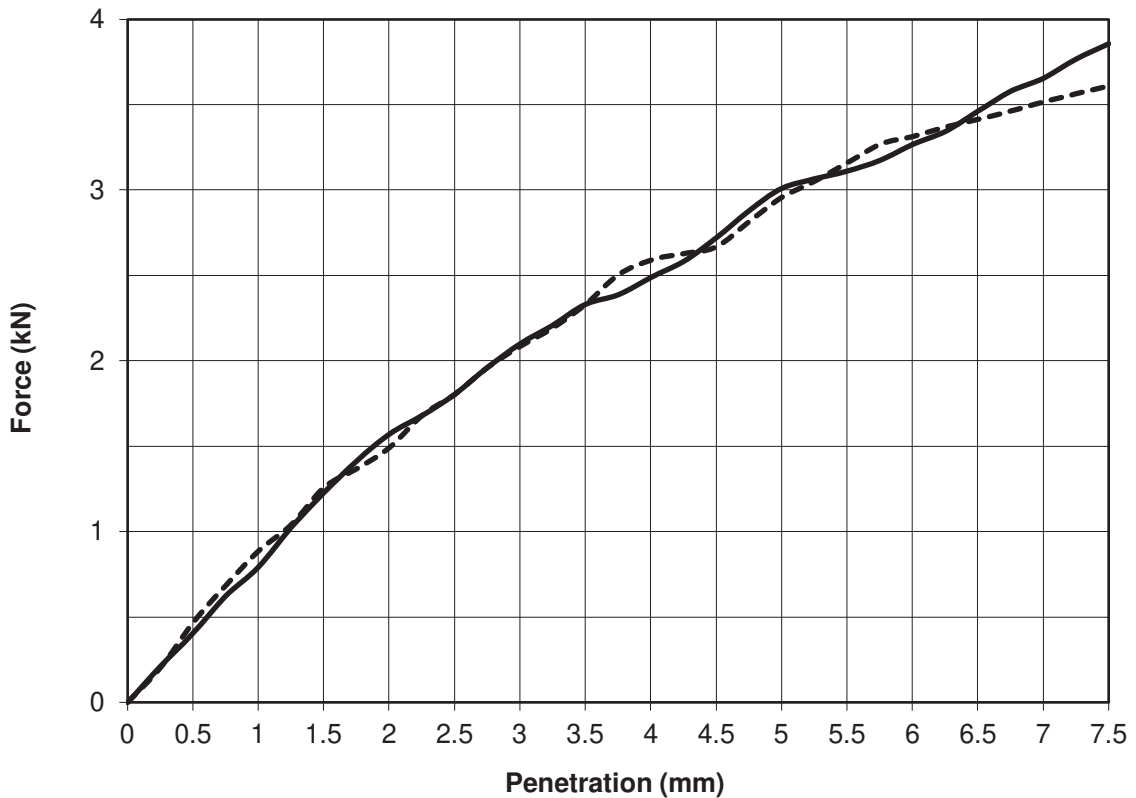
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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: ————— Top - - - - - Base

Description: Brown slightly sandy, slightly gravelly, CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

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

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

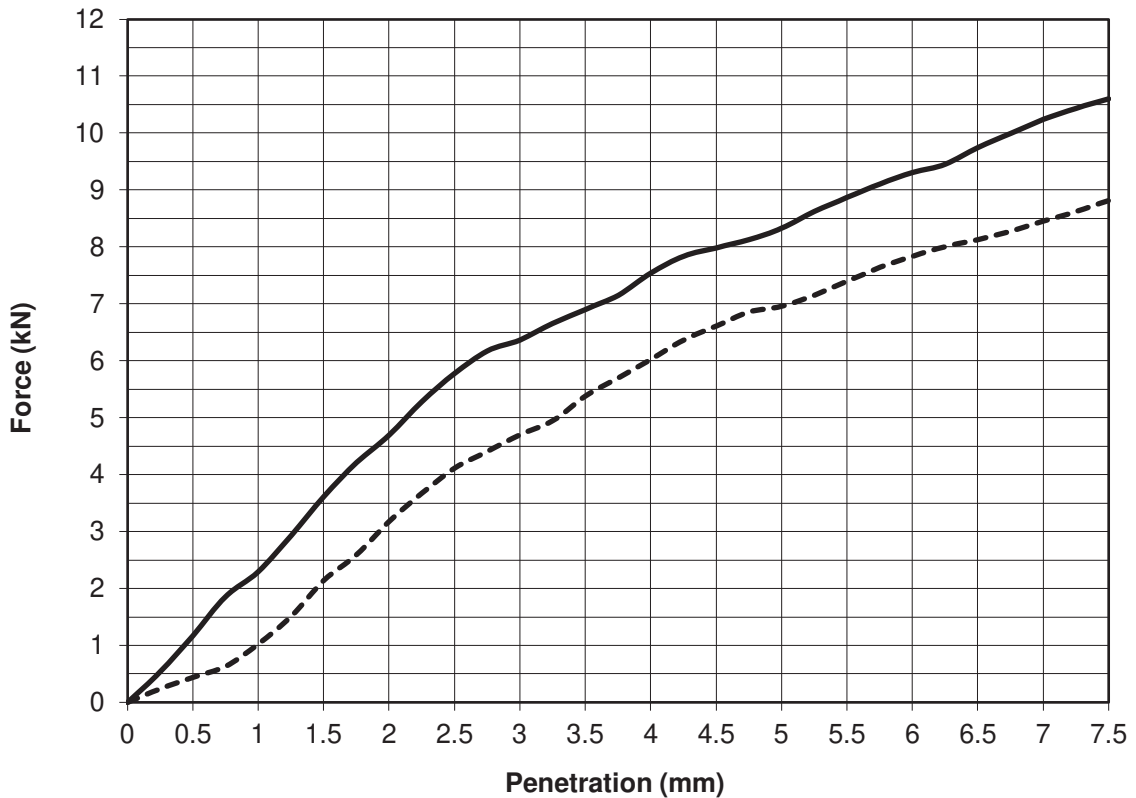
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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: ————— Top - - - - - Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	44	35
Moisture Content %	5	5

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

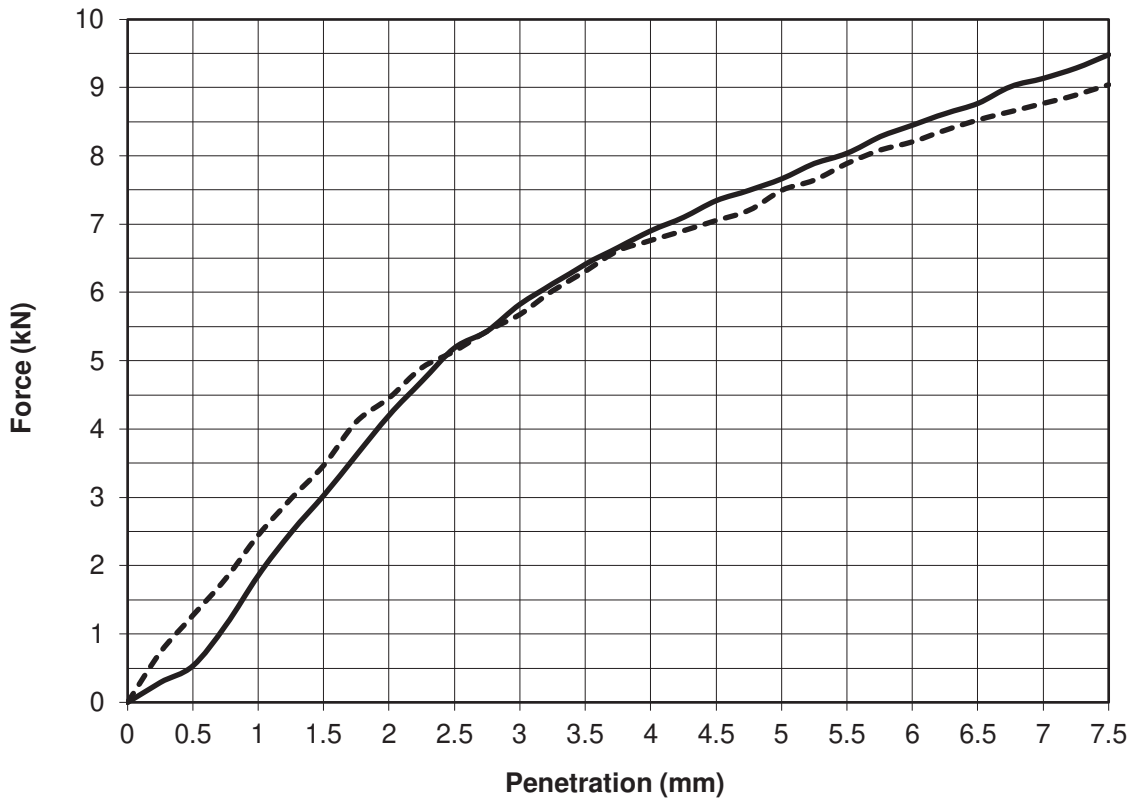
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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



Key: ————— Top - - - - - Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	39	39
Moisture Content %	7	7

Persons authorized to approve reports

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

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

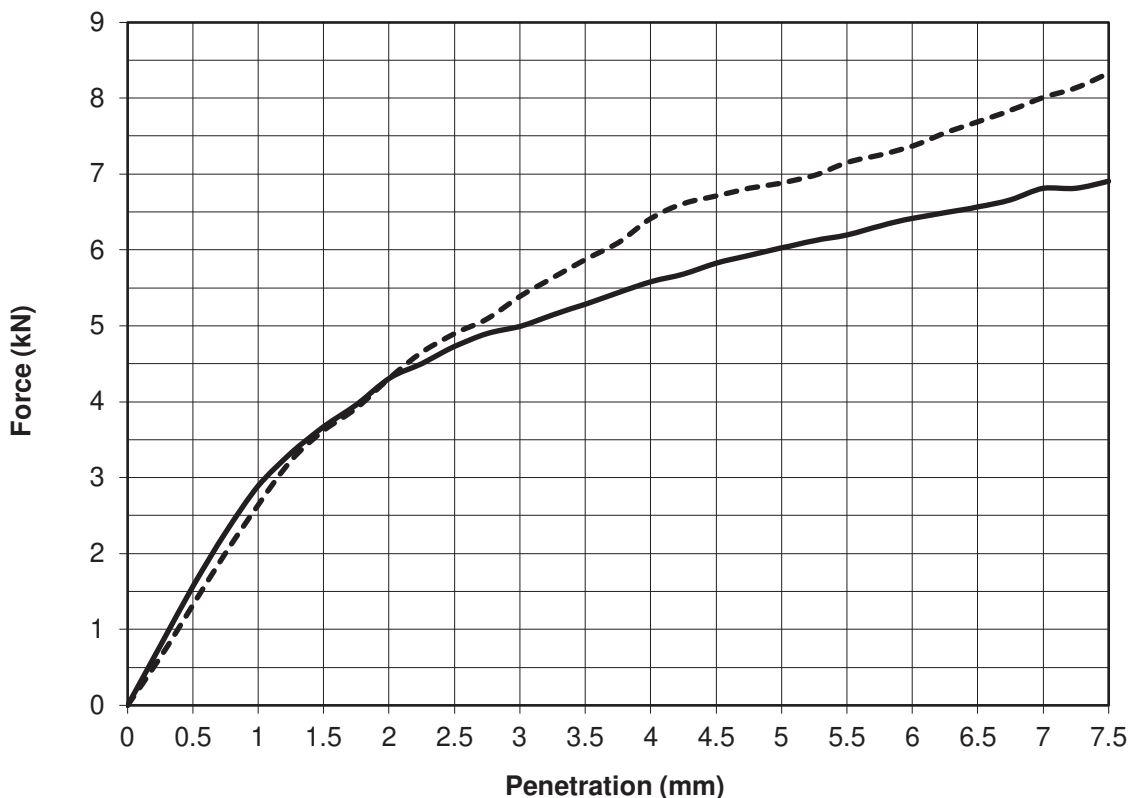
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108932	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: ————— Top - - - - - Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked Point 3	
Moisture Content (%):	9	Bulk Density (Mg/m ³):	1.97
Surcharge (kg):	4	Dry Density (Mg/m ³):	1.80
% Material >20mm:	0		
Method of compaction: Static Compaction Method 2			

Test Result	Top	Base
CBR %	36	37
Moisture Content %	9	9

Persons authorized to approve reports

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

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
	<i>H Byrne</i>	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 Unit J5,M7 Business Park
 Naas Co.Kildare
 045 899324

TEST REPORT

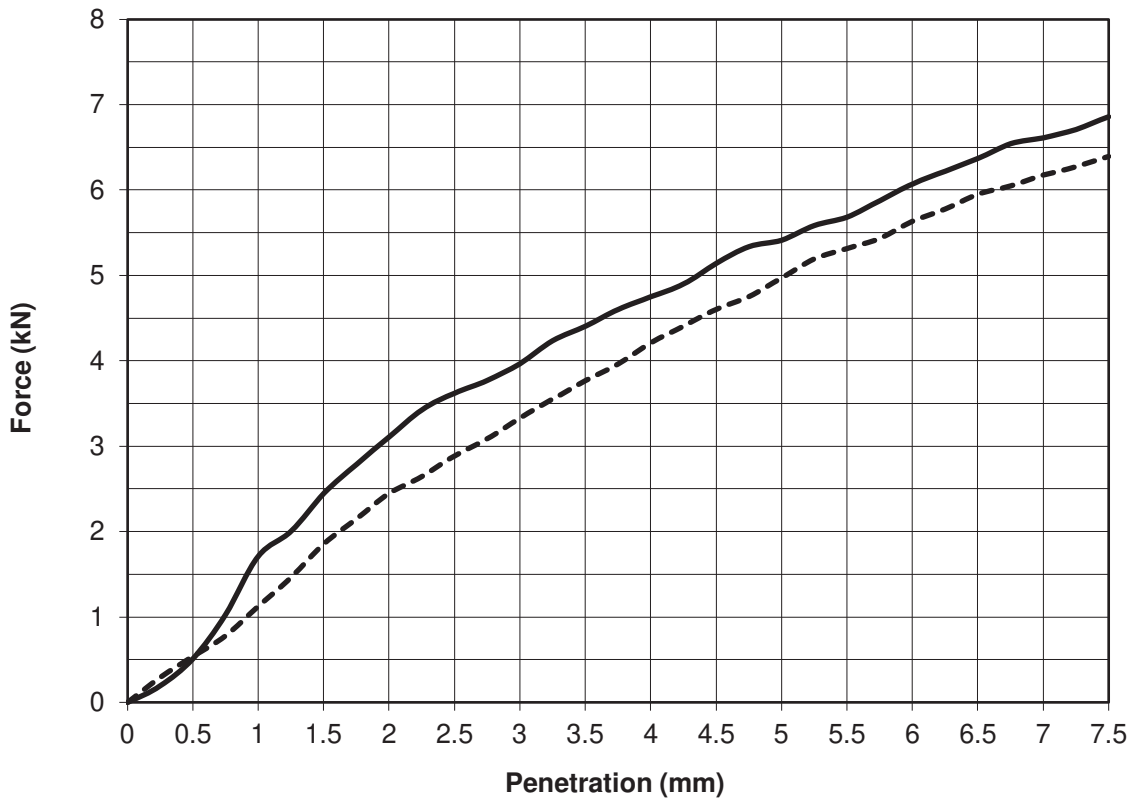
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

Report No.	R108933	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: ————— Top - - - - - Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	27	25
Moisture Content %	11	11

Persons authorized to approve reports

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

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
	<i>H Byrne</i>	24/01/20	1 of 1

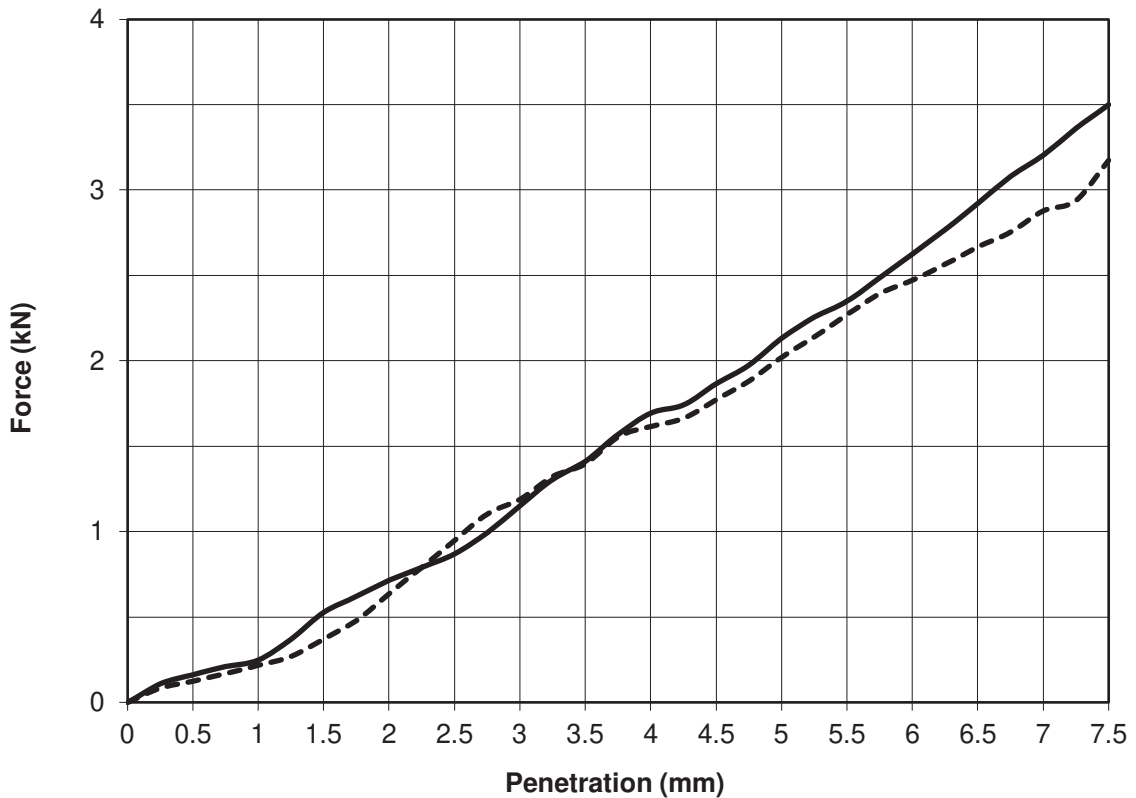
TEST REPORT
Determination of California Bearing Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

RECEIVED 18/01/2023

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



Key: ————— Top - - - - - Base

Description: Brown very sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked 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 Compaction Method 2			

Test Result	Top	Base
CBR %	11	10
Moisture Content %	13	13

Persons authorized to approve reports
 J Barrett (Quality Manager)
 H Byrne (Laboratory Manager)

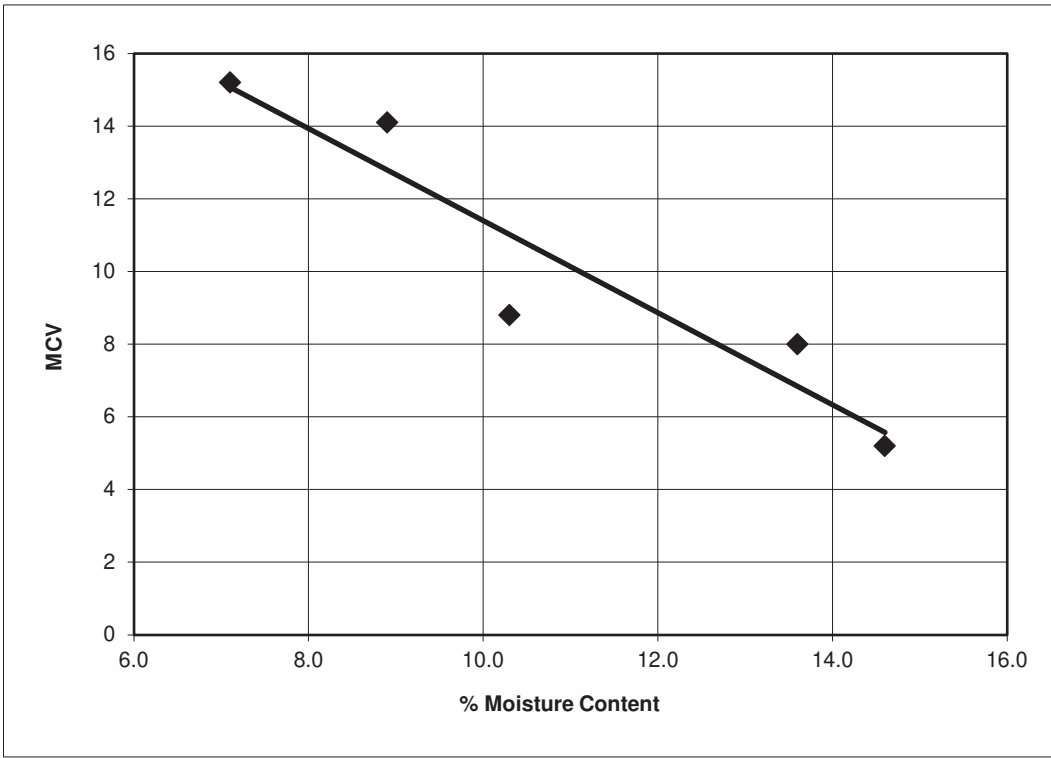
IGSL Ltd
 Materials Laboratory
 M7 Business Park
 Naas Co.Kildare
 045 846176

TEST REPORT
 Determination of MCV / moisture content
 Relation of a soil
 Tested in accordance with BS1377-4:1990, clause 5.3

RECEIVED: 18/07/2023

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

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

IGSL Ltd
 Materials Laboratory
 M7 Business Park
 Naas Co.Kildare
 045 846176

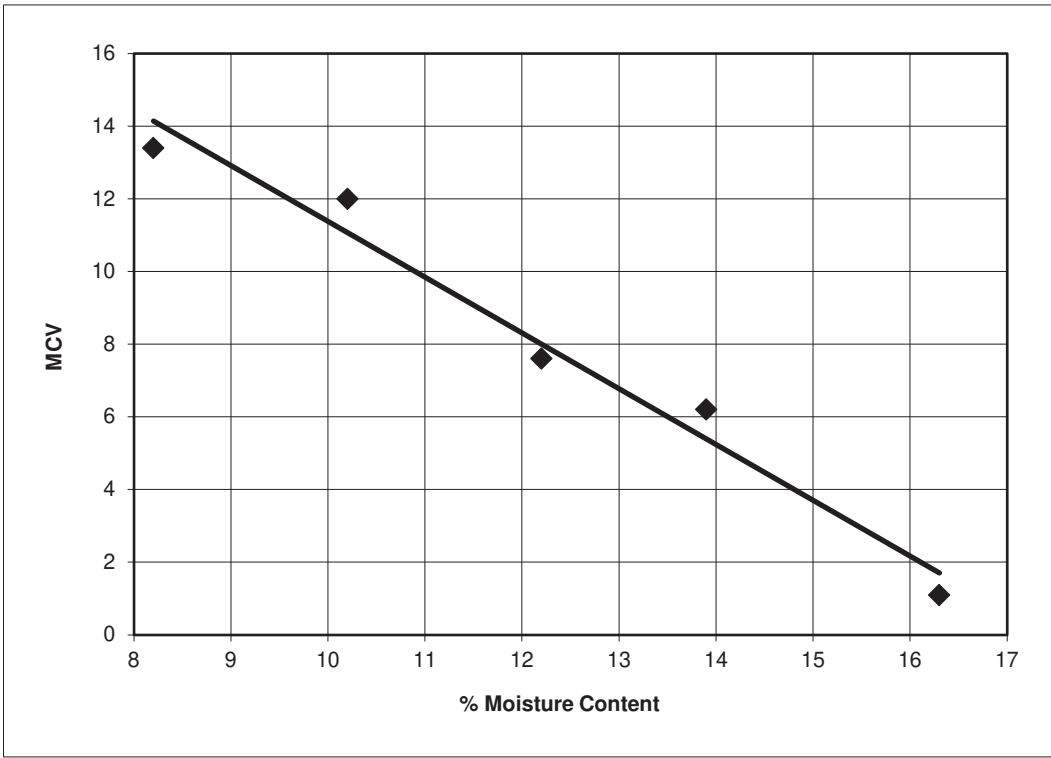
TEST REPORT
 Determination of MCV / moisture content
 Relation of a soil

Tested in accordance with BS1377-4:1990, clause 5.3

RECEIVED: 18/07/2023

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)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

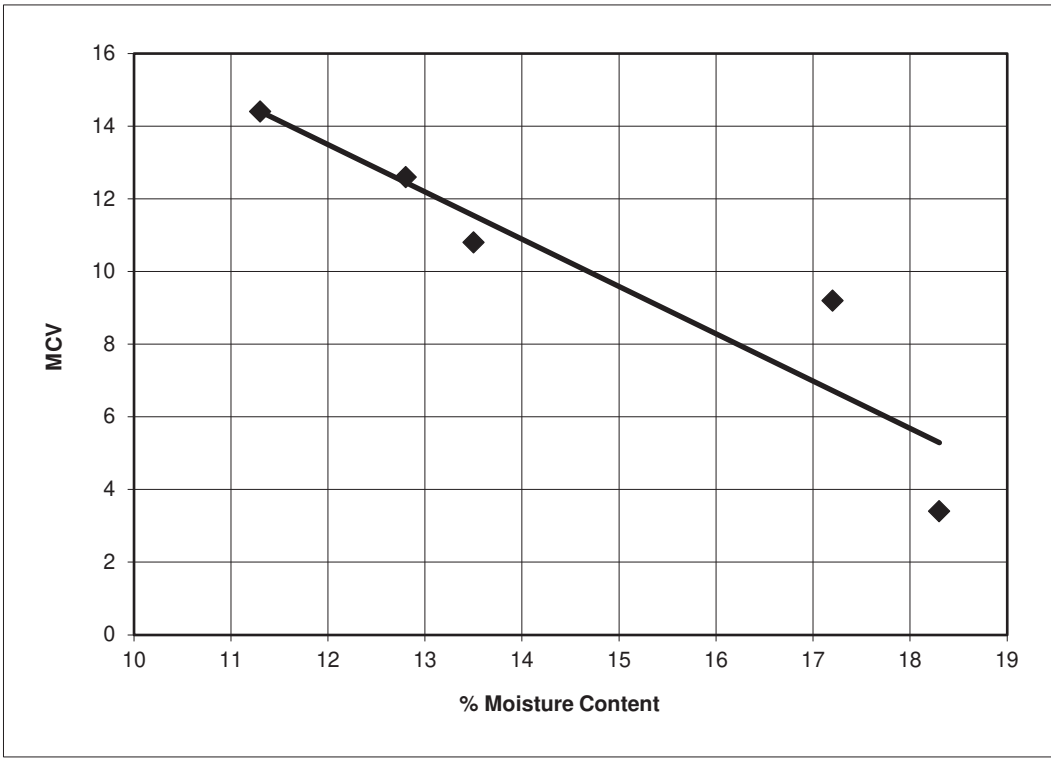
IGSL Ltd
 Materials Laboratory
 M7 Business Park
 Naas Co.Kildare
 045 846176

TEST REPORT
 Determination of MCV / moisture content
 Relation of a soil
 Tested in accordance with BS1377-4:1990, clause 5.3

RECEIVED: 18/07/2023

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)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

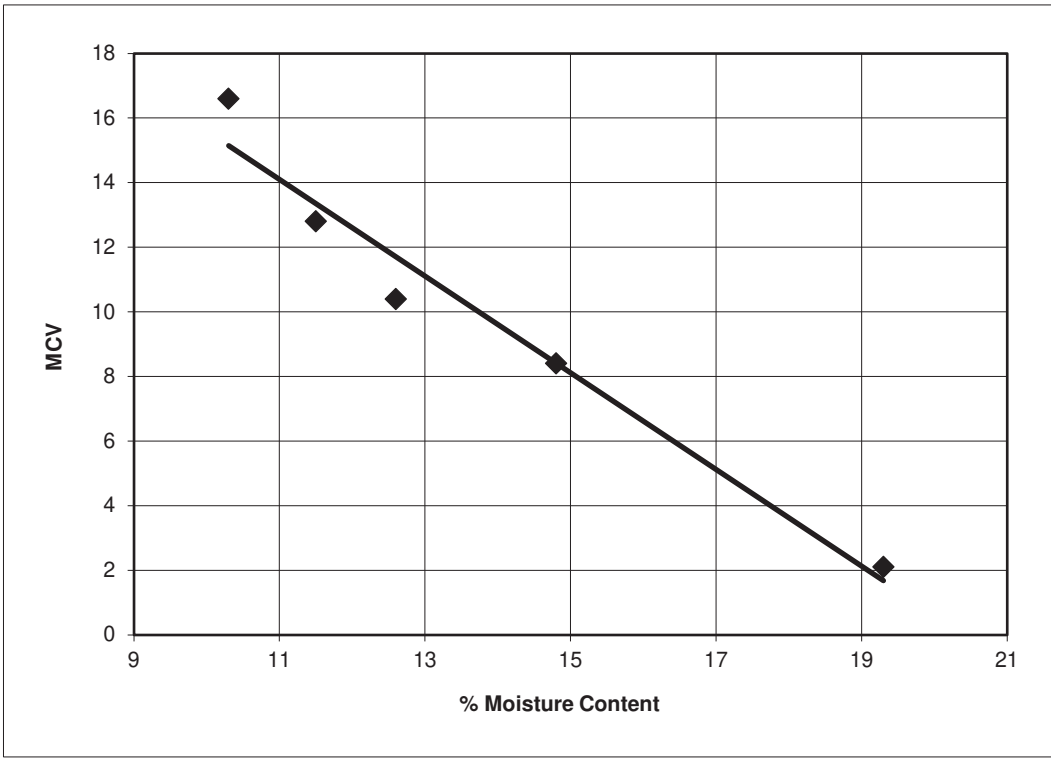
IGSL Ltd
 Materials Laboratory
 M7 Business Park
 Naas Co.Kildare
 045 846176

TEST REPORT
 Determination of MCV / moisture content
 Relation of a soil
 Tested in accordance with BS1377-4:1990, clause 5.3

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

RECEIVED: 18/07/2023

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)

IGSL Ltd Materials Laboratory

Approved by	Date	Page No.
<i>H Byrne</i>	24/01/20	1 of 1

Test Report

Dry Density/Moisture Content Relationship

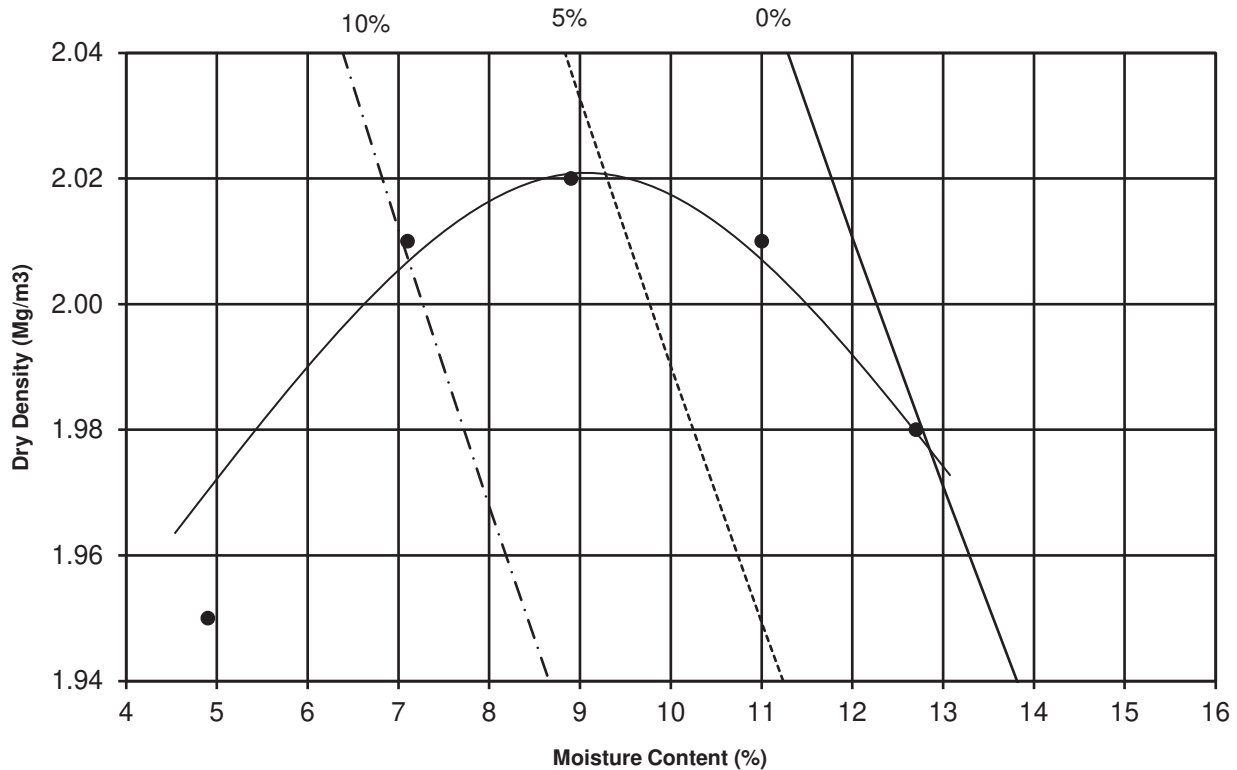
Tested in accordance with BS1377:Part 4:1990



RECEIVED: 18/07/2023

Report No. R108855 Contract No. 22150
 Contract Name: Liffey Park Technology Park, Leixlip, Co. Kildare
 Lab Contract No. 22150 Location: TP03
 Sample No. AA108756 Depth (m) 1.5 Material Type B
 Lab sample no. A19/5956 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)	1.98	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 (%): 9
 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

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

The result relates to the specimen tested.
 Opinions and interpretations are outside the scope of accreditation

22/01/20

1 of 1

IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

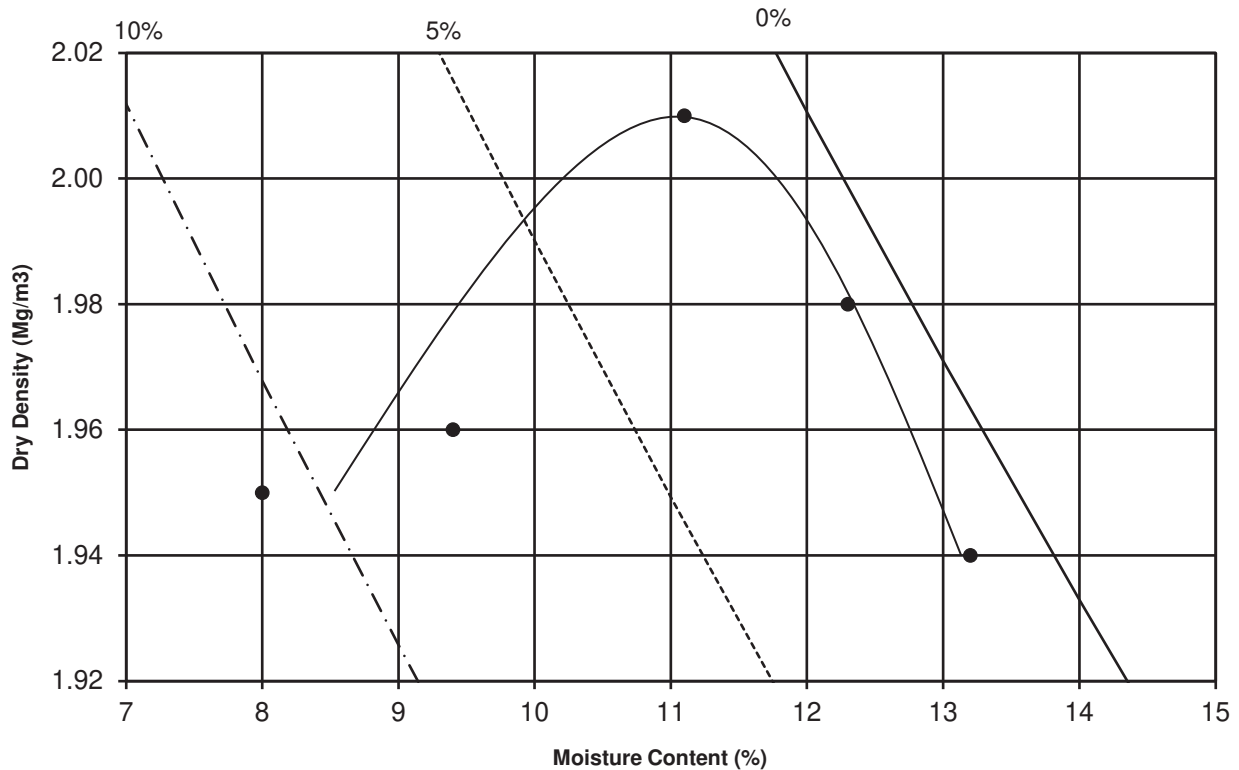
Tested in accordance with BS1377:Part 4:1990



RECEIVED: 18/07/2023

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 B
 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)
 H Byrne (Laboratory Manager)

The result relates to the specimen tested.
 Opinions and interpretations are outside the scope of accreditation

IGSL Materials Laboratory

Approved by

Date

24/01/20

Page

1 of 1

Test Report

Dry Density/Moisture Content Relationship

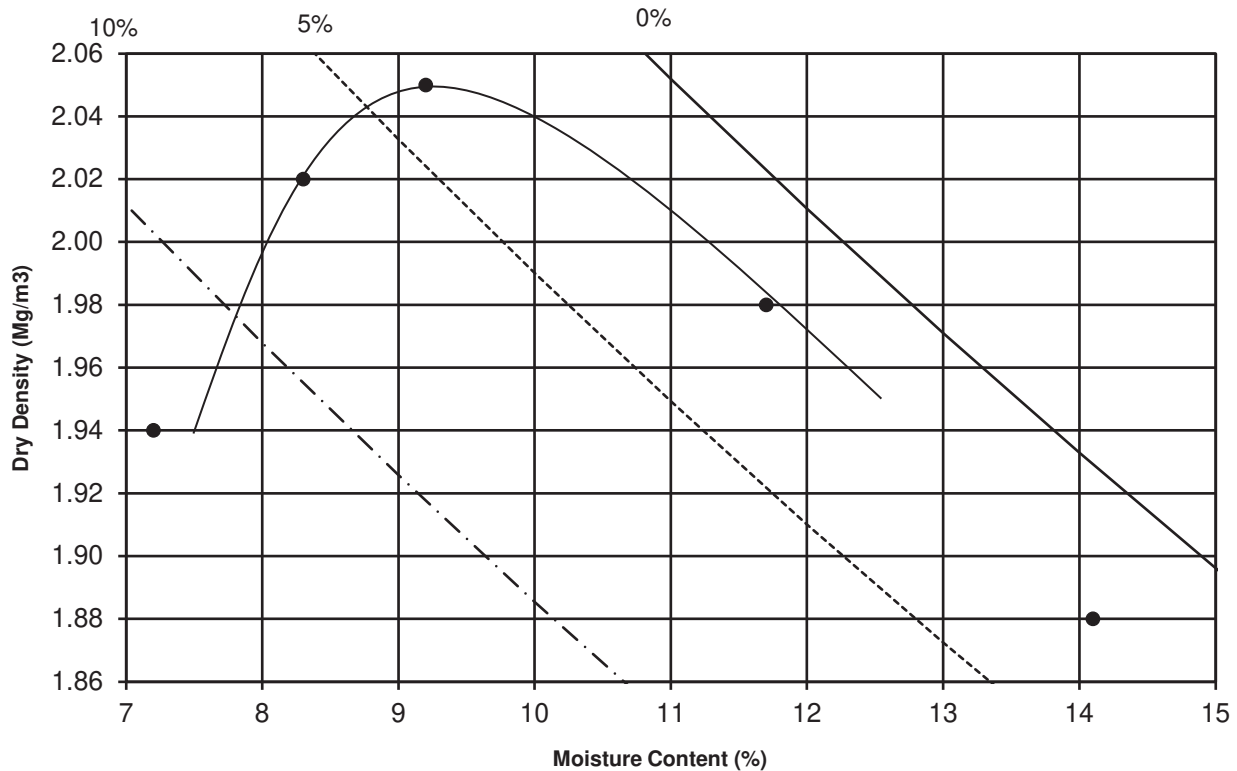
Tested in accordance with BS1377:Part 4:1990



RECEIVED: 18/07/2023

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) 0.8 Material Type B
 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 (%): 9

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)
 H Byrne (Laboratory Manager)

The result relates to the specimen tested.
 Opinions and interpretations are outside the scope of accreditation

IGSL Materials Laboratory

Approved by

Date

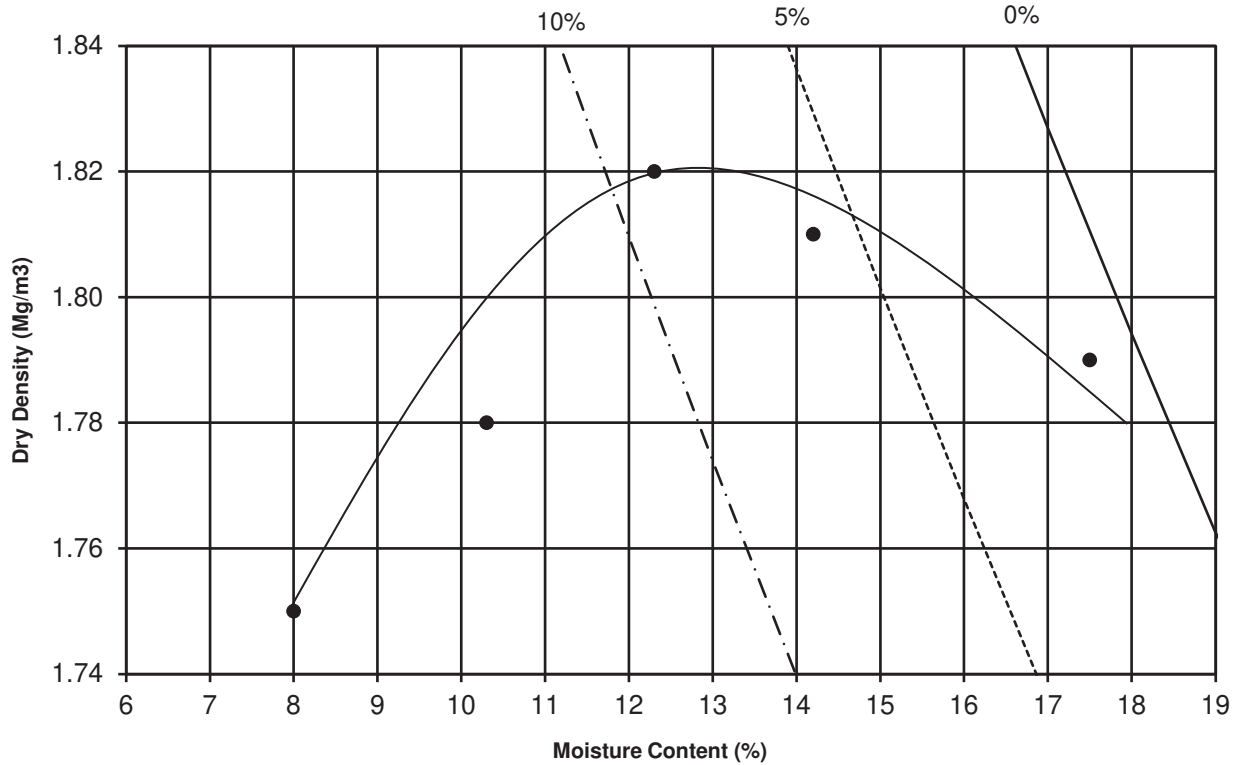
24/01/20

Page

1 of 1

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 B
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: 11

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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

IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

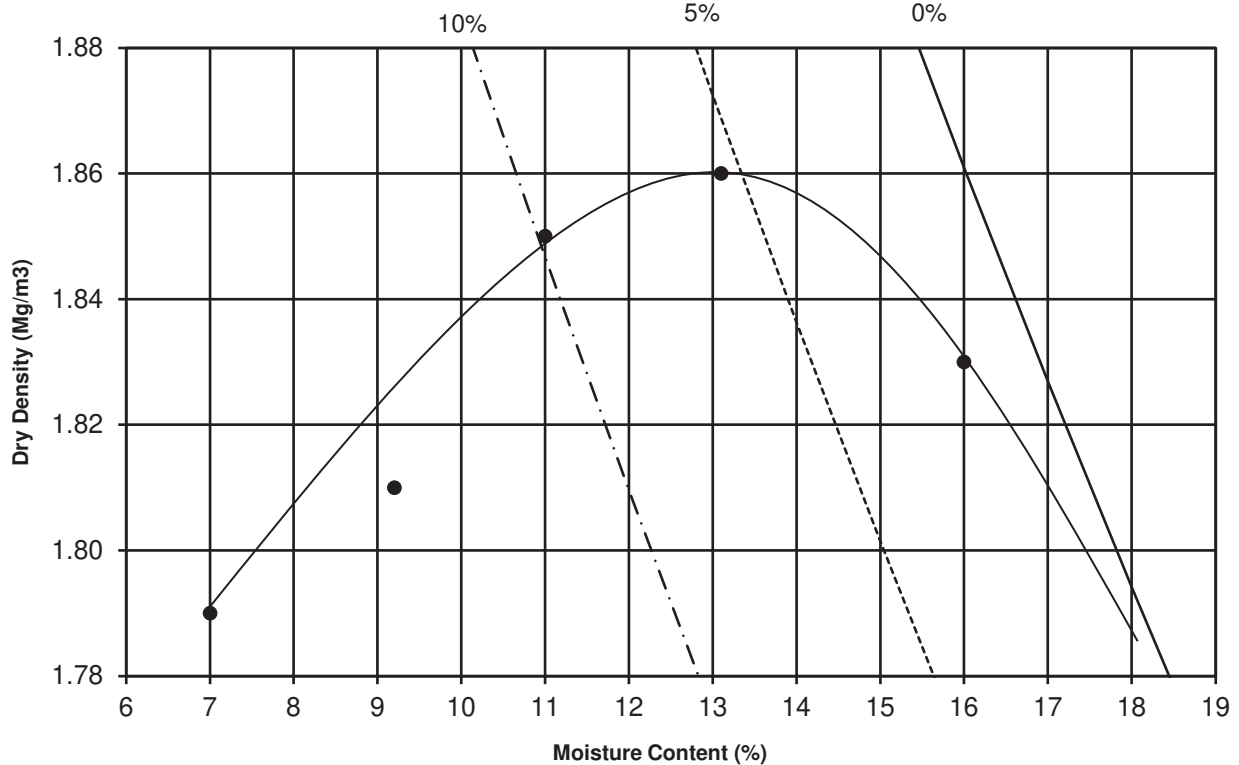
Dry Density/Moisture Content Relationship

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. 22150 Location: TP11
 Sample No. AA118616 Depth (m) 1.5 Material Type B
 Lab sample no. A19/5972 Customer: Arup, 50 Ringsend Rd, Grand Canal Dock, Dublin 4
 Date Received: 09/01/2020 Test Method: 2.5 KG Rammer
 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: 0

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

The result relates to the specimen tested.
 Opinions and interpretations are outside the scope of accreditation

IGSL Materials Laboratory

Approved by *H Byrne* Date 24/01/20 Page 1 of 1

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)*



RECEIVED: 18/07/2023

Report no: R107327

Contract Name: Liffey Park Tech Campus Contract No: 22150

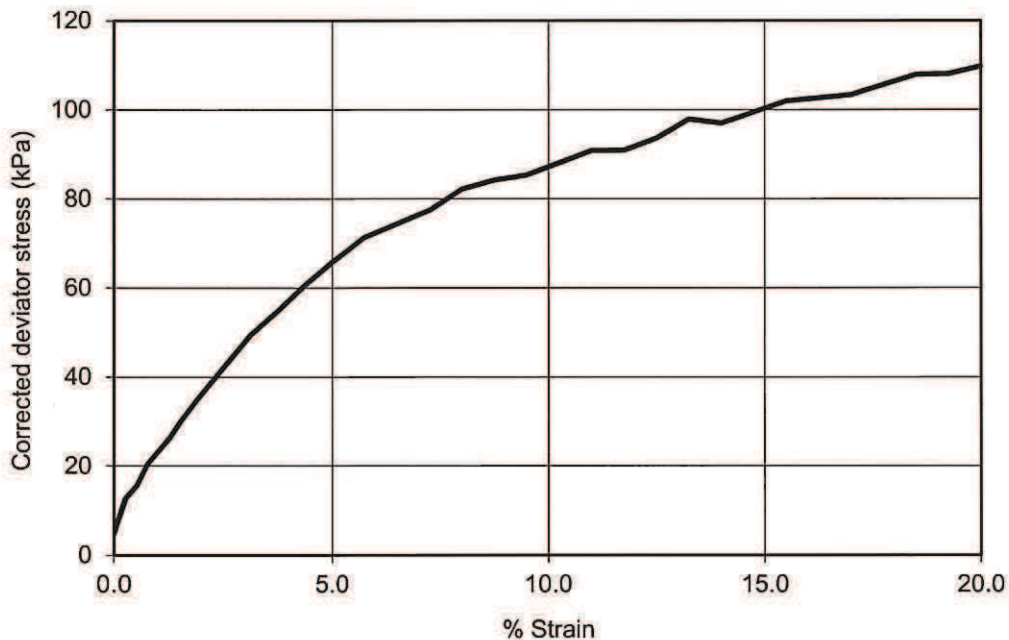
Location: RC01 2.6m Sample No: -

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)

	IGSL Materials Laboratory	Approved by	Date	Page
			19/11/19	1 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)



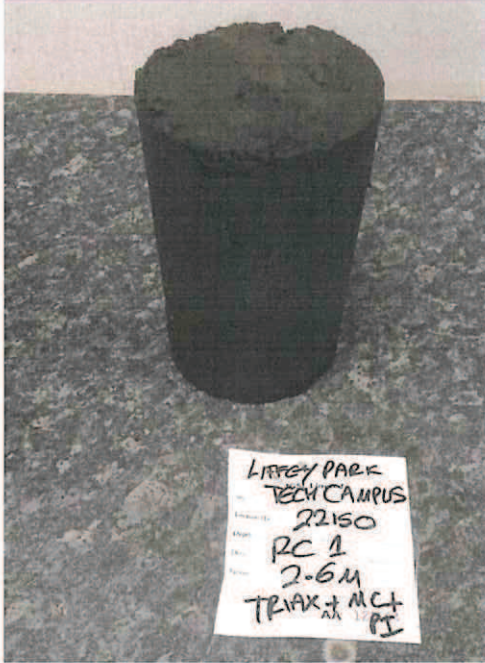
Report no: R107327

Contract Name: Liffey Park Tech Campus

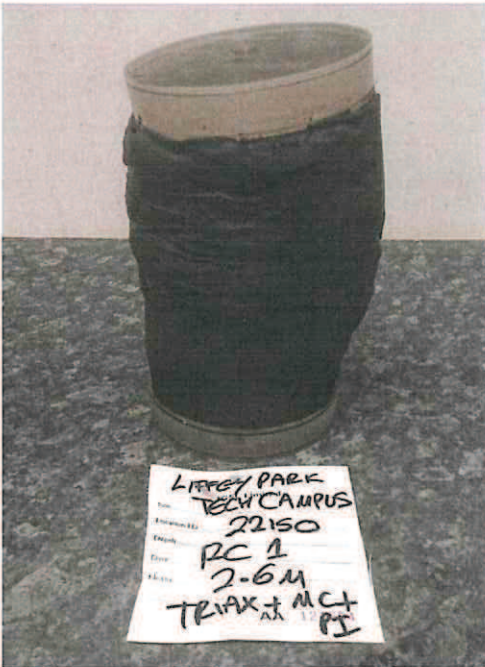
Contract No: 22150

Location: RC01 2.6m

Lab Sample No. -



Before Test.




After Test

RECEIVED: 18/07/2023

Person authorised to approve report: H Byrne (Quality Manager)

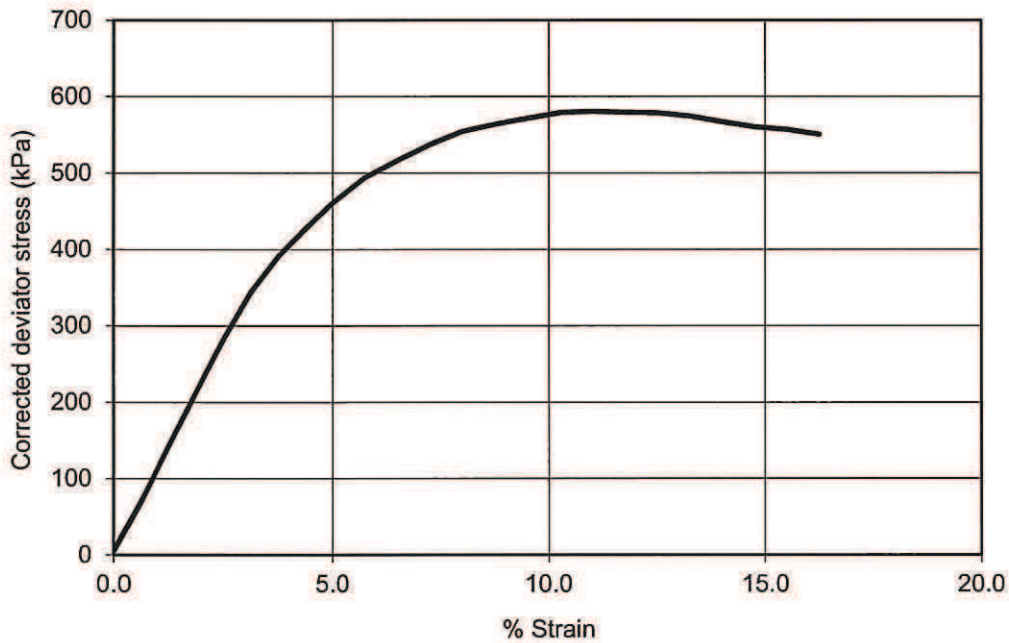
	IGSL Materials Laboratory	Approved by	Date	Page
			19/11/19	2 of 2

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)*	

RECEIVED: 18/07/2023

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/m ³)	2.31	Dry density (Mg/m ³)	2.12



Strain at failure %	11	Cohesion C _u (kPa)	290
		(Undrained shear strength kPa)	
Rate of strain (%/minute)	2.0		
Thickness of membrane	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)

	IGSL Materials Laboratory	Approved by	Date	Page
			19/11/19	1 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)



RECEIVED: 18/07/2023

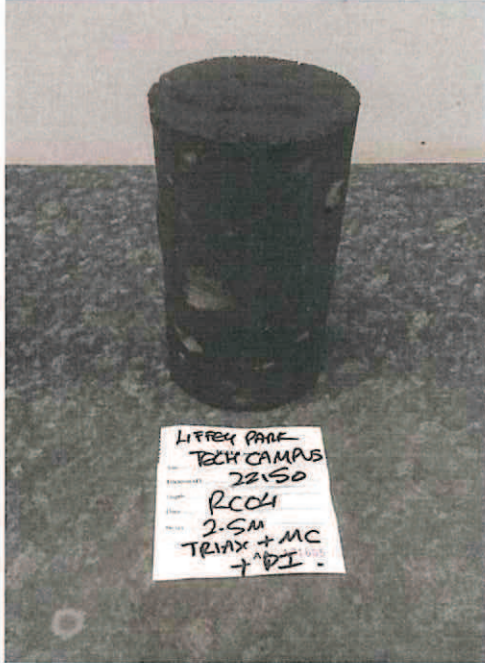
Report no: R107328

Contract Name: Liffey Park Tech Campus

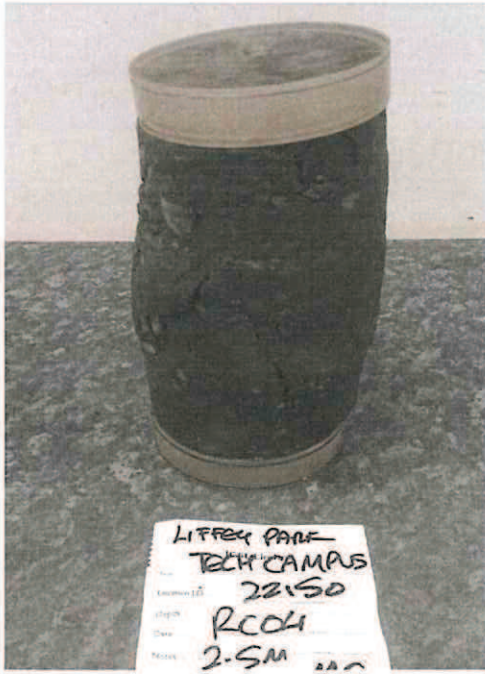
Contract No: 22150

Location: RC04 2.5m

Lab Sample No. -



Before Test.



After Test

Person authorised to approve report: H Byrne (Quality Manager)



IGSL Materials Laboratory

Approved by

[Handwritten signature]

Date

19/11/19

Page

2 of 2



One dimensional Consolidation

BS1377:Part 5:1990

RECEIVED: 18/07/2023

Report No. R107329

Contract: Liffey Park Tech Campus

Contract number: 22150

BH: RC04 Sample number: -

Depth (m): 2.8

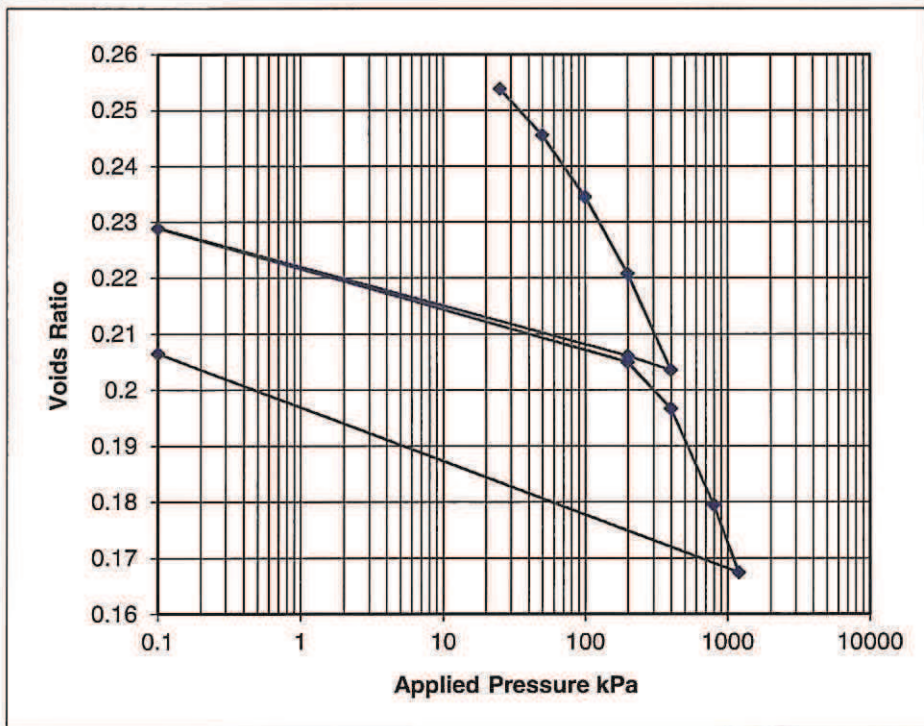
Description Dark grey slightly sandy slightly gravelly CLAY

Specimen Height (mm) 20.0 Specimen diameter (mm) 75.1

	Initial	Final
Moisture content %	10	11
Bulk density Mg/m ³	2.28	2.41
Dry density Mg/m ³	2.08	2.17
Void ratio	0.273	0.207

Assumed Particle density Mg/m³ 2.65

Applied Pressure (kPa)	m_v (m ² /MN)	c_v (m ² /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



RECEIVED: 18/07/2023

Appendix 9
Rock Laboratory Testing

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



RECEIVED: 18/07/2023

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

Customer 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	C I	Grey sandy gravelly CLAY
RC04	N/A	2.5	A19/5224	U	8.7	40	16	24	35	WS	4.4	C I	Black sandy gravelly CLAY
RC04	N/A	2.8	A19/5225	U	8.2	29	14	15	60	WS	4.4	C L	Grey sandy gravelly CLAY
RC06	N/A	1.95	A19/5226	U	9.9	32	17	15	44	WS	4.4	C L	Grey sandy gravelly CLAY

Notes: Preparation: WS - Wet sieved Sample Type: B - Bulk Disturbed Remarks: Results apply to the sample as received.
 AR - As received U - Undisturbed
 NP - Non plastic
 Liquid Limit 4.3 Cone Penetrometer definitive method
 Clause: 4.4 Cone Penetrometer one point method

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	Approved by	Date	Page
	H Byrne (Laboratory Manager)		18/11/19	1 of 1

RECEIVED 18/07/2023



(Diametrial) POINT LOAD STRENGTH INDEX TEST DATA									
Contract: Liffey Park Technology Campus Contract no. 22150 Date of test: 28/11/2019				Sample Type: Core					
RC No.	Depth m	D (Diameter) mm	P (failure load) kN	F	Is (index strength) Mpa	Is(50) (index strength) Mpa	*UCS MPa	Type	Orientation
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	//
RC04	8.8	102	22.0	1.378	2.11	2.91	58	d	//
	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	//
RC06	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	//
	3.1	102	4.0	1.378	0.38	0.53	11	d	//
RC12	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	//
	3.4	102	6.0	1.378	0.58	0.79	16	d	//
RC12	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	//	

Statistical Summary Data		Is(50)	UCS*	*UCS Normal Distribution Curve		Abbreviations	
Number of Samples Tested		20	20			i	irregular
Minimum		0.53	11			a	axial
Average		2.21	44			b	block
Maximum		3.84	77			d	diametral
Standard Dev.		1.14	23			approx. orientation to planes of weakness/bedding	
Upper 95% Confidence Limit		4.44	88.79			U	unknown
Lower 95% Confidence Limit		-0.03	-0.57			P	perpendicular
<u>Comments:</u>				//	parallel		
*UCS taken as k x Point Load Is(50): k=				20			

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC01
 Depth (m): 3.50m

Sample Description

Colour:	Dark grey
Grain size:	Fine-grained
Weathering Grade:	Fresh
Rock Type:	Muddy LIMESTONE

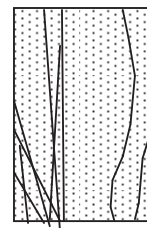
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	200	
Diameter (∅)	102	mm

Sketch of Failure Surfaces



Testing

Load Rate	4.3	kN/min
Load at Failure (P)	219	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{219000}{8167.14}$

= $\frac{1000 \times P}{\pi \times (\frac{\phi}{2})^2}$

= 26.80 (Mpa)

Bulk Density = 2.66 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC01
 Depth (m): 4.30m

Sample Description

Colour:	Dark grey
Grain size:	Fine-grained
Weathering Grade:	Fresh
Rock Type:	Muddy LIMESTONE

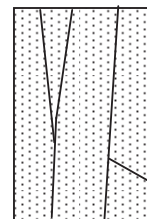
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	204	
Diameter (∅)	102.1	mm

Sketch of Failure Surfaces



Testing

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

Strength Calculations

Uniaxial Compressive Strength = $\frac{194000}{8183.16185}$

= $\frac{1000 \times P}{\pi \times (\frac{\phi}{2})^2}$

= 23.70 (Mpa)

Bulk Density = 2.65 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC01
 Depth (m): 7.40m

Sample Description

Colour:	Dark grey
Grain size:	Fine-grained
Weathering Grade:	Fresh
Rock Type:	Muddy LIMESTONE

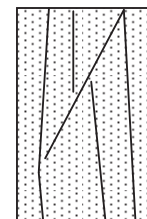
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	155	
Diameter (∅)	102	mm

Sketch of Failure Surfaces



Testing

Load Rate	4.3	kN/min
Load at Failure (P)	511	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{511000}{8167.14}$

= $\frac{1000 \times P}{\pi \times (\frac{\phi}{2})^2}$

= 62.54 (Mpa)

Bulk Density = 2.66 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

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

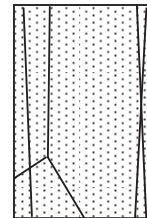
Weathering Grade Criteria

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

Length: 199 mm
 Diameter (∅): 102 mm

Sketch of Failure Surfaces



Testing

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

Strength Calculations

$$\begin{aligned} \text{Uniaxial Compressive Strength} &= \frac{588000}{8167.14} \\ &= \frac{1000 \times P}{\pi \times (\varnothing/2)^2} \\ &= 71.96 \text{ (Mpa)} \\ \text{Bulk Density} &= 2.65 \text{ (Mg/m}^3\text{)} \end{aligned}$$

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC04
 Depth (m): 5.50m

Sample Description

Colour: Dark grey
 Grain size: Fine-grained
 Weathering Grade: Fresh
 Rock Type: LIMESTONE

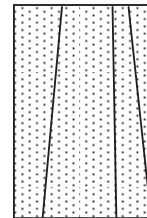
Weathering Grade Criteria

I. Fresh: Unchanged from original state
 II. Slightly weathered: Slight discolouration, slight weakening
 III. Moderately weathered: Considerable weakening, penetrative discolouration
 IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length: 204 mm
 Diameter (∅): 102 mm

Sketch of Failure Surfaces



Testing

Load Rate: 4.3 kN/min
 Load at Failure (P): 448 kN

Strength Calculations

$$\begin{aligned} \text{Uniaxial Compressive Strength} &= \frac{448000}{8167.14} \\ &= \frac{1000 \times P}{\pi \times (\varnothing/2)^2} \\ &= 54.83 \text{ (Mpa)} \\ \text{Bulk Density} &= 2.66 \text{ (Mg/m}^3\text{)} \end{aligned}$$

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC04
 Depth (m): 6.20m

Sample Description

Colour:	Dark grey
Grain size:	Fine-grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

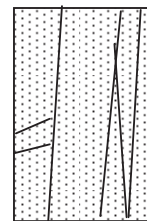
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	202	
Diameter (∅)	102	mm

Sketch of Failure Surfaces



Testing

Load Rate	4.3	kN/min
Load at Failure (P)	501	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{501000}{8167.14}$

= $\frac{1000 \times P}{\pi \times (\frac{\phi}{2})^2}$

= 61.31 (Mpa)

Bulk Density = 2.65 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC04
 Depth (m): 9.40m

Sample Description

Colour: Dark grey
 Grain size: Fine-grained
 Weathering Grade: Fresh
 Rock Type: LIMESTONE

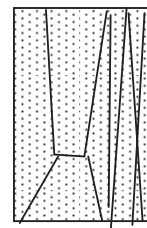
Weathering Grade Criteria

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

Length: 142 mm
 Diameter (∅): 102 mm

Sketch of Failure Surfaces



Testing

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

Strength Calculations

Uniaxial Compressive Strength = $\frac{344000}{8167.14}$
 = $\frac{1000 \times P}{\pi \times (\varnothing/2)^2}$
 = 42.10 (Mpa)
 Bulk Density = 2.66 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC06
 Depth (m): 4.90m

Sample Description

Colour: Dark grey
 Grain size: Fine-grained
 Weathering Grade: Fresh
 Rock Type: LIMESTONE

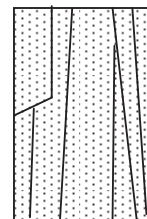
Weathering Grade Criteria

I. Fresh: Unchanged from original state
 II. Slightly weathered: Slight discolouration, slight weakening
 III. Moderately weathered: Considerable weakening, penetrative discolouration
 IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length: 225 mm
 Diameter (∅): 102 mm

Sketch of Failure Surfaces



Testing

Load Rate: 4.3 kN/min
 Load at Failure (P): 277 kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{277000}{8167.14}$
 = $\frac{1000 \times P}{\pi \times (\varnothing/2)^2}$
 = 33.90 (Mpa)
 Bulk Density = 2.65 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC12
 Depth (m): 6.30m

Sample Description

Colour:	Dark grey
Grain size:	Fine-grained
Weathering Grade:	Fresh
Rock Type:	LIMESTONE

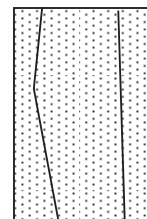
Weathering Grade Criteria

I. Fresh:	Unchanged from original state
II. Slightly weathered:	Slight discolouration, slight weakening
III. Moderately weathered:	Considerable weakening, penetrative discolouration
IV. Highly weathered:	Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length	218	
Diameter (∅)	102	mm

Sketch of Failure Surfaces



Testing

Load Rate	4.3	kN/min
Load at Failure (P)	634	kN

Strength Calculations

Uniaxial Compressive Strength = $\frac{634000}{8167.14}$

= $\frac{1000 \times P}{\pi \times (\frac{\phi}{2})^2}$

= 77.59 (Mpa)

Bulk Density = 2.67 (Mg/m³)

Notes:

Uniaxial Compression Test Report Sheet

I.G.S.L.

RECEIVED: 18/07/2023

Sample Identification

Contract Name: Liffey Park Technology Campus
 Job Number: 22150
 Hole No: RC12
 Depth (m): 7.00m

Sample Description

Colour: Dark grey
 Grain size: Fine-grained
 Weathering Grade: Fresh
 Rock Type: LIMESTONE

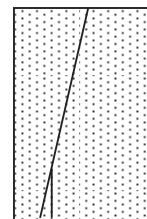
Weathering Grade Criteria

I. Fresh: Unchanged from original state
 II. Slightly weathered: Slight discolouration, slight weakening
 III. Moderately weathered: Considerable weakening, penetrative discolouration
 IV. Highly weathered: Considerable weakening, penetrative discolouration, breaks in hand

Sample Measurements

Length: 256 mm
 Diameter (∅): 102 mm

Sketch of Failure Surfaces



Testing

Load Rate: 4.3 kN/min
 Load at Failure (P): 461 kN

Strength Calculations

$$\begin{aligned} \text{Uniaxial Compressive Strength} &= \frac{461000}{8167.14} \\ &= \frac{1000 \times P}{\pi \times (\varnothing/2)^2} \\ &= 56.42 \text{ (Mpa)} \\ \text{Bulk Density} &= 2.67 \text{ (Mg/m}^3\text{)} \end{aligned}$$

Notes:



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

RECEIVED: 18/07/2023

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



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

RECEIVED: 18/07/2023

L19/2708/IGS/001

Project Reference - 22150 - Liffey Park Technology Campus

Analytical Test Results - Aggregate Testing

NC Reference	64185	64186
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	64185	64186
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



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

RECEIVED: 18/07/2023

L19/2708/IGS/001

Project Reference - 22150 - Liffey Park Technology Campus

Analysis Methodologies and Notes

Determinant	Test method and notes
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.

RECEIVED: 18/07/2023

Appendix 10

Chemical & Environmental Laboratory Testing (Chemtest Laboratory)



RECEIVED: 18/07/2023

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: Lifey 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

Project: Liftey Park

Client: IGSL		Chemtest Job No.:		19-42101	19-42101		
Quotation No.:		Chemtest Sample ID.:		944874	944875		
		Sample Location:		BH9	BH10		
		Sample Type:		SOIL	SOIL		
		Top Depth (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

RECEIVED: 18/07/2023

Project: Liffey Park

Client: IGSL		Chemtest Job No.:		19-42101	19-42101
Quotation No.:		Chemtest Sample ID.:		944874	944875
		Sample Location:		BH9	BH10
		Sample Type:		SOIL	SOIL
		Top Depth (m):		0.10	0.50
		Asbestos Lab:		COVENTRY	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	8.1
pH	U	2010		4.0	8.6
Arsenic	U	2450	mg/kg	1.0	21
Barium	U	2450	mg/kg	10	29
Cadmium	U	2450	mg/kg	0.10	1.4
Mercury Low Level	U	2450	mg/kg	0.05	0.05
Molybdenum	U	2450	mg/kg	2.0	3.1
Antimony	N	2450	mg/kg	2.0	< 2.0
Copper	U	2450	mg/kg	0.50	39
Nickel	U	2450	mg/kg	0.50	34
Lead	U	2450	mg/kg	0.50	15
Selenium	U	2450	mg/kg	0.20	1.5
Zinc	U	2450	mg/kg	0.50	51
Chromium (Trivalent)	N	2490	mg/kg	1.0	12
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
LOI	U	2610	%	0.10	1.6
Total Organic Carbon	U	2625	%	0.20	1.2
Mineral Oil	N	2670	mg/kg	10	< 10
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
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
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	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0

RECEIVED: 18/07/2023

Project: Liftey Park

Client: IGSL		Chemtest Job No.:		19-42101	19-42101	
Quotation No.:		Chemtest Sample ID.:		944874	944875	
		Sample Location:		BH9	BH10	
		Sample Type:		SOIL	SOIL	
		Top Depth (m):		0.10	0.50	
		Asbestos 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

RECEIVED: 18/07/2023

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	pH	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–C44 Aromatics: >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) ICES7 Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS

SOP	Title	Parameters included	Method summary
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

APPROVED: 18/07/2023

Report Information

RECEIVED: 18/07/2023

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- 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



RECEIVED: 18/07/2023

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

Project: Liffey Park

Client: IGSL		Chemtest Job No.:		19-42283	19-42283		
Quotation No.:		Chemtest Sample ID.:		945664	945665		
		Sample Location:		BH7	BH8		
		Sample Type:		SOIL	SOIL		
		Top Depth (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	10:1	µg/l	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

RECEIVED: 18/07/2023

Project: Liffey Park

Client: IGSL		Chemtest Job No.:		19-42283	19-42283	
Quotation No.:		Chemtest Sample ID.:		945664	945665	
		Sample Location:		BH7	BH8	
		Sample Type:		SOIL	SOIL	
		Top Depth (m):		0.50	0.50	
		Asbestos 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
pH	U	2010		4.0	8.1	8.3
Arsenic	U	2450	mg/kg	1.0	26	29
Barium	U	2450	mg/kg	10	44	52
Cadmium	U	2450	mg/kg	0.10	0.37	0.23
Mercury Low Level	U	2450	mg/kg	0.05	< 0.05	< 0.05
Molybdenum	U	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	2450	mg/kg	0.50	6.9	2.9
Selenium	U	2450	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	%	0.10	0.82	0.93
Total Organic Carbon	U	2625	%	0.20	1.3	1.5
Mineral Oil	N	2670	mg/kg	10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	U	2680	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	2680	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

RECEIVED: 18/07/2023

Project: Liffey Park

Client: IGSL		Chemtest Job No.:		19-42283	19-42283	
Quotation No.:		Chemtest Sample ID.:		945664	945665	
		Sample Location:		BH7	BH8	
		Sample Type:		SOIL	SOIL	
		Top Depth (m):		0.50	0.50	
		Asbestos 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	mg/kg	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	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

RECEIVED: 18/07/2023

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	pH	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

SOP	Title	Parameters included	Method summary
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

APPROVED: 18/07/2023

Report Information

RECEIVED: 18/07/2023

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- 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



RECEIVED: 18/07/2023

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

RECEIVED: 18/07/2023

Client: IGSL	Chemtest Job No.: 19-42454		19-42454				
Quotation No.: Q19-18246	Chemtest Sample ID.: 946458		946468				
Order No.:	Client Sample Ref.:		AA118621	AA120065			
	Sample Location:		TP02	BH09			
	Sample Type:		SOIL	SOIL			
	Top Depth (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

Results - Soil

Client: IGSL	Chemtest Job No.:													
Quotation No.: Q19-18246	Chemtest Sample ID.:													
Order No.:	Client Sample Ref.:													
	Sample Location:													
	Sample Type:													
	Top Depth (m):													
	Asbestos Lab:													
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	25	19	17	13	8.1	2.6	19	28	13	22
pH	U	2010		4.0	7.9									
pH (2.5:1)	N	2010		4.0			8			8.7	8		8	
Magnesium (Water Soluble)	N	2120	g/l	0.010			1.2			0.81	0.78		0.98	
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
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
Chloride (Water Soluble)	U	2220	g/l	0.010			< 0.010			< 0.010	< 0.010		< 0.010	
Nitrate (Water Soluble)	N	2220	g/l	0.010			< 0.010			< 0.010	< 0.010		< 0.010	
Ammonium (Water Soluble)	U	2120	g/l	0.01			0.80			0.55	0.36		0.57	
Sulphate (Acid Soluble)	U	2430	%	0.010	0.13	0.033	0.081	0.056	0.011	0.017	0.066	0.16	0.073	0.04
Arsenic	U	2450	mg/kg	1.0	20									
Barium	U	2450	mg/kg	10	210									
Cadmium	U	2450	mg/kg	0.10	2.3									
Mercury Low Level	U	2450	mg/kg	0.05	0.22									
Molybdenum	U	2450	mg/kg	2.0	3.3									
Antimony	N	2450	mg/kg	2.0	< 2.0									
Copper	U	2450	mg/kg	0.50	38									
Nickel	U	2450	mg/kg	0.50	46									
Lead	U	2450	mg/kg	0.50	68									
Selenium	U	2450	mg/kg	0.20	1.2									
Zinc	U	2450	mg/kg	0.50	100									
Chromium (Trivalent)	N	2490	mg/kg	1.0	17									
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50									
LOI	U	2610	%	0.10	8.5									
Total Organic Carbon	U	2625	%	0.20	3.1									
Mineral Oil	N	2670	mg/kg	10	< 10									
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									
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0									

Results - Soil

Client: IGS	Chemtest Job 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
	Sample Location:					TP02	TPSA01	TPSA04	TPSA04	TP06	TP07	TP08	TP08	TP10	TP10
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	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
	Asbestos Lab:					COVENTRY		COVENTRY			COVENTRY	COVENTRY		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	mg/kg	1.0	< 1.0										
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										
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0										
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										
Naphthalene	N	2800	mg/kg	0.010	0.21										
Acenaphthylene	N	2800	mg/kg	0.010	0.05										
Acenaphthene	N	2800	mg/kg	0.010	0.11										
Fluorene	N	2800	mg/kg	0.010	0.09										
Phenanthrene	N	2800	mg/kg	0.010	0.79										
Anthracene	N	2800	mg/kg	0.010	0.14										
Fluoranthene	N	2800	mg/kg	0.010	0.98										
Pyrene	N	2800	mg/kg	0.010	0.85										
Benzoanthracene	N	2800	mg/kg	0.010	0.4										
Chrysene	N	2800	mg/kg	0.010	0.43										
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	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										
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	0.25										
Coronene	N	2800	mg/kg	0.010	< 0.010										
Total Of 17 PAH's	N	2800	mg/kg	0.20	5.2										
PCB 28	U	2815	mg/kg	0.010	< 0.010										
PCB 52	U	2815	mg/kg	0.010	< 0.010										
PCB 90+101	U	2815	mg/kg	0.010	< 0.010										
PCB 118	U	2815	mg/kg	0.010	< 0.010										
PCB 153	U	2815	mg/kg	0.010	< 0.010										

Project: 22150 Liffey Park Technology Park Leixlip

Client: IGSL	Chemtest Job No.:										
Quotation No.: Q19-18246	Chemtest Sample ID.:										
Order No.:	Client Sample Ref.:										
	Sample Location:										
	Sample Type:										
	Top Depth (m):										
	Asbestos Lab:										
Determinand	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						

RECEIVED: 18/07/2023

Client: IGSL		Chemtest Job No.:		19-42454	
Quotation No.: Q19-18246		Chemtest Sample ID.:		946468	
Order No.:		Client Sample Ref.:		AA120065	
		Sample Location:		BH09	
		Sample Type:		SOIL	
		Top Depth (m):		2.00	
		Asbestos Lab:		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 SO ₄	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	mg/kg	1.0	20
Barium	U	2450	mg/kg	10	17
Cadmium	U	2450	mg/kg	0.10	0.91
Mercury Low Level	U	2450	mg/kg	0.05	< 0.05
Molybdenum	U	2450	mg/kg	2.0	3.8
Antimony	N	2450	mg/kg	2.0	< 2.0
Copper	U	2450	mg/kg	0.50	24
Nickel	U	2450	mg/kg	0.50	53
Lead	U	2450	mg/kg	0.50	8.3
Selenium	U	2450	mg/kg	0.20	1.8
Zinc	U	2450	mg/kg	0.50	37
Chromium (Trivalent)	N	2490	mg/kg	1.0	8.1
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
LOI	U	2610	%	0.10	2.7
Total Organic Carbon	U	2625	%	0.20	1.1
Mineral Oil	N	2670	mg/kg	10	< 10
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
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0

RECEIVED: 18/07/2023

Client: IGSL		Chemtest Job No.:		19-42454	
Quotation No.: Q19-18246		Chemtest Sample ID.:		946468	
Order No.:		Client Sample Ref.:		AA120065	
		Sample Location:		BH09	
		Sample Type:		SOIL	
		Top Depth (m):		2.00	
		Asbestos 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	mg/kg	1.0	< 1.0
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
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
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
Naphthalene	N	2800	mg/kg	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	mg/kg	0.010	< 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	< 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	< 0.010
Coronene	N	2800	mg/kg	0.010	< 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	1
PCB 28	U	2815	mg/kg	0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010

Results - Soil

RECEIVED: 18/07/2023

Client: IGSL	Chemtest Job No.: 19-42454				
Quotation No.: Q19-18246	Chemtest Sample ID.: 946468				
Order No.:	Client Sample Ref.: AA120065				
	Sample Location: BH09				
	Sample Type: SOIL				
	Top Depth (m): 2.00				
	Asbestos Lab: COVENTRY				
Determinand	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

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	pH	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 measurement 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–C44 Aromatics: >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.

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) ICES7 Congeners 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	Compliance Test for Leaching of Granular Waste Material and Sludge

RECEIVED: 18/07/2023

Report Information

RECEIVED: 18/07/2023

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- 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







RECEIVED: 18/07/2023

Appendix 11
As-Surveyed Site Plan

22150 Liffey Park Technology Campus

As-Surveyed Ground Investigation

Legend

-  Cable Percussive Borehole
-  DCP Probe
-  Infiltration Test
-  Geobor Corehole
-  Trial Pit
-  Trial Pit & Plate Bearing Test



Google Earth

© 2020 Google

500 m





GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus				BOREHOLE NO. BH03	
CO-ORDINATES 698,560.26 E 734,688.40 N		RIG TYPE DANDO 2000		SHEET Sheet 1 of 1	
GROUND LEVEL (m AOD) 54.24		BOREHOLE DIAMETER (mm)		DATE COMMENCED 18/11/2019	
		BOREHOLE DEPTH (m) 3.00		DATE COMPLETED 18/11/2019	
CLIENT O' Flynn Group		SPT HAMMER REF. NO.		BORED BY W.BUTLER	
ENGINEER Arup		ENERGY RATIO (%)		PROCESSED BY S.C	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TOPSOIL		54.04	0.20						
	Soft brown sandy CLAY									
1	Soft grey/brown sandy SILT/CLAY with some fine gravel		53.04	1.20					N = 7 (2, 3, 3, 2, 1, 1)	
	Soft to firm dark brown gravelly CLAY		52.64	1.60						
2	Firm brown gravelly CLAY with some cobbles.		52.24	2.00					N = 7 (1, 0, 1, 1, 2, 3)	
	Stiff black sandy gravelly CLAY with some cobbles.		51.74	2.50						
3	Obstruction End of Borehole at 3.00 m		51.24	3.00					N = 60/150 mm (30, 40, 10, 50)	
4										
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.9	3	1							No water strike

INSTALLATION DETAILS					GROUNDWATER PROGRESS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

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 Sample (Jar + Vial + Tub) UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
---	--

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

BOREHOLE NO. BH05

SHEET Sheet 1 of 1

CO-ORDINATES 699,017.14 E
734,408.45 N
GROUND LEVEL (m AOD) 48.98

RIG TYPE DANDO 2000
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 2.90

DATE COMMENCED 06/11/2019
DATE COMPLETED 06/11/2019

CLIENT ENGINEER O' Flynn Group
Arup

SPT HAMMER REF. NO.
ENERGY RATIO (%)

BORED BY W.BUTLER
PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TOPSOIL		48.78	0.20						
1	Soft to firm grey/brown sandy SILT/CLAY with some fine gravel				AA120053	B	1.00		N = 10 (2, 1, 2, 2, 3, 3)	
2	Very stiff brown gravelly CLAY with occasional cobbles		47.38	1.60						
2	Very stiff to hard black sandy gravelly CLAY with some cobbles		46.98	2.00	AA120054	B	2.00		N = 50/150 mm (4, 4, 16, 34)	
3	Obstruction End of Borehole at 2.90 m		46.08	2.90	AA120055	B	2.90		N = 50/75 mm (25, 50)	
4										
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.5	2.6	0.75							No water strike
2.8	2.9	2							
INSTALLATION DETAILS				GROUNDWATER PROGRESS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

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 Sample (Jar + Vial + Tub)

UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

BOREHOLE NO. BH07

SHEET Sheet 1 of 1

CO-ORDINATES 698,891.78 E
734,856.93 N
GROUND LEVEL (m AOD) 49.87

RIG TYPE DANDO 2000
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 1.70

DATE COMMENCED 11/11/2019
DATE COMPLETED 11/11/2019

CLIENT ENGINEER O' Flynn Group
Arup

SPT HAMMER REF. NO.
ENERGY RATIO (%)

BORED BY W.BUTLER
PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND consisting of reinforced CONCRETE MADE GROUND (Comprised of angular stone fill)		49.67	0.20						
1	Dense angular COBBLES and boulders		48.67	1.20	AA120062	B	1.00	N = 50/225 mm (13, 15, 19, 17, 14)		
	Obstruction End of Borehole at 1.70 m		48.17	1.70	AA120063	B	1.50			
2								N = 50/75 mm (25, 50)		
3										
4										
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
1.3	1.4	0.5							No water strike
1.5	1.7	1.5							
INSTALLATION DETAILS				GROUNDWATER PROGRESS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

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 Sample (Jar + Vial + Tub)

UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

BOREHOLE NO. BH08

SHEET Sheet 1 of 1

CO-ORDINATES 699,021.02 E
734,847.88 N
GROUND LEVEL (m AOD) 49.56

RIG TYPE DANDO 2000
BOREHOLE DIAMETER (mm)
BOREHOLE DEPTH (m) 3.90

DATE COMMENCED 13/11/2019
DATE COMPLETED 13/11/2019

CLIENT O' Flynn Group
ENGINEER Arup

SPT HAMMER REF. NO.
ENERGY RATIO (%)

BORED BY W.BUTLER
PROCESSED BY S.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND consisting of reinforced CONCRETE MADE GROUND (Comprised of angular stone fill)		49.36	0.20						
					AA120067	B	0.50			
					AA120068	B	1.00			
1	Firm brown gravelly CLAY with some cobbles.		48.36	1.20						
2	Stiff black sandy gravelly CLAY with some cobbles.		47.76	1.80						
					AA120069	B	2.00		N = 19 (2, 3, 4, 5, 4, 6)	
3					AA120070	B	3.00		N = 34 (4, 10, 7, 3, 3, 21)	
4	Obstruction End of Borehole at 3.90 m		45.66	3.90	AA120071	B	3.90		(39, 50)	
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
3.9	3.9	1							No water strike
INSTALLATION DETAILS				GROUNDWATER PROGRESS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

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 Sample (Jar + Vial + Tub)

UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

BOREHOLE NO. BH09

SHEET Sheet 1 of 1

CO-ORDINATES 698,993.19 E
734,894.47 N
GROUND LEVEL (m AOD) 48.37

RIG TYPE DANDO 2000
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 3.10

DATE COMMENCED 12/11/2019
DATE COMPLETED 12/11/2019

CLIENT ENGINEER O' Flynn Group
Arup

SPT HAMMER REF. NO.
ENERGY RATIO (%)

BORED BY W.BUTLER
PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND consisting of reinforced CONCRETE MADE GROUND (Comprised of angular stone fill)		48.17	0.20						
1	Very stiff black very sandy gravelly CLAY with occasional angular cobbles		47.17	1.20	AA120064	B	1.00		N = 41 (7, 8, 10, 10, 9, 12)	
2	Dense slightly clayey gravelly angular COBBLES		46.57	1.80	AA120065	B	2.00		N = 51 (10, 9, 9, 12, 15, 15)	
3	Obstruction End of Borehole at 3.10 m		45.27	3.10	AA120066	B	3.00		N = 70/150 mm (14, 14, 20, 50)	
4										
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.9	3.1	2							No water strike
INSTALLATION DETAILS				GROUNDWATER PROGRESS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
					12-11-19	3.10	Nil	1.30	End of drilling

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 Sample (Jar + Vial + Tub)

UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		BOREHOLE NO. BH10
CO-ORDINATES 698,953.96 E 734,939.44 N		SHEET Sheet 1 of 1
GROUND LEVEL (m AOD) 48.36	RIG TYPE DANDO 2000	DATE COMMENCED 15/11/2019
	BOREHOLE DIAMETER (mm)	DATE COMPLETED 15/11/2019
	BOREHOLE DEPTH (m) 1.40	
CLIENT ENGINEER O' Flynn Group Arup	SPT HAMMER REF. NO.	BORED BY W.BUTLER
	ENERGY RATIO (%)	PROCESSED BY S.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND consisting of reinforced CONCRETE	[Cross-hatch pattern]	48.16	0.20						
	MADE GROUND (Comprised of angular stone fill)					AA120072	B	0.50		
1			47.16	1.20						
	Dense angular COBBLES and boulders	[Circle pattern]	46.96	1.40					(30)	
	Obstruction End of Borehole at 1.40 m				AA120074	B	1.40			
2										
3										
4										
5										
6										

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
1.4	1.4	1							No water strike

INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments
Date	Tip Depth	RZ Top	RZ Base	Type					

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 Sample (Jar + Vial + Tub)	UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
---	---	---

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19



GEOTECHNICAL BORING RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

BOREHOLE NO. BH11

SHEET Sheet 1 of 1

CO-ORDINATES 699,080.79 E
735,011.84 N
GROUND LEVEL (m AOD) 49.69

RIG TYPE DANDO 2000
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 3.50

DATE COMMENCED 08/11/2019
DATE COMPLETED 09/11/2019

CLIENT ENGINEER O' Flynn Group
Arup

SPT HAMMER REF. NO.
ENERGY RATIO (%)

BORED BY W.BUTLER
PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TARMACADAM MADE GROUND (Comprised of angular stone fill)		49.59	0.10						
1	Stiff to very stiff grey sandy SILT/CLAY with occasional fine gravel		48.49	1.20	AA120059	B	1.00			
2	Hard dark brown/black gravelly CLAY with angular cobbles		47.69	2.00	AA120060	B	2.00	N = 28 (2, 5, 6, 7, 7, 8)		
3					AA120061	B	3.00	N = 50/150 mm (8, 9, 34, 16)		
4	Obstruction End of Borehole at 3.50 m		46.19	3.50						

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
INSTALLATION DETAILS				GROUNDWATER PROGRESS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

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 Sample (Jar + Vial + Tub)

UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 22150.GPJ IGSL.GDT 29/11/19

Soakaway Design f -value from field tests (F2C) IGSL

Contract: 22150	Contract No: 22150
Test No. TPSA01	Northing: 735156.119
Client ARUP	Easting: 698516.401
Date: 06/11/2019	Elevation: 56.203

Summary of ground conditions			Ground water
from	to	Description	
0.00	0.25	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlet	None observed
0.25	0.40	SUBSOIL: Brown sandy gravelly CLAY.	
0.40	1.50	Firm brown mottled grey mottled black sandy gravelly CLAY	
1.50	2.00	Firm to stiff dark grey mottled black sandy gravelly CLAY	

Notes: Soakaway located beside trial pit TPSA01

Field Data

Depth to Water (m)	Elapsed Time (min)
0.90	0.00
0.90	1.00
0.88	2.00
0.88	3.00
0.87	4.00
0.87	5.00
0.87	10.00
0.87	15.00
0.87	20.00
0.88	25.00
0.88	30.00
0.88	35.00
0.88	40.00
0.88	50.00
0.88	60.00

Field Test

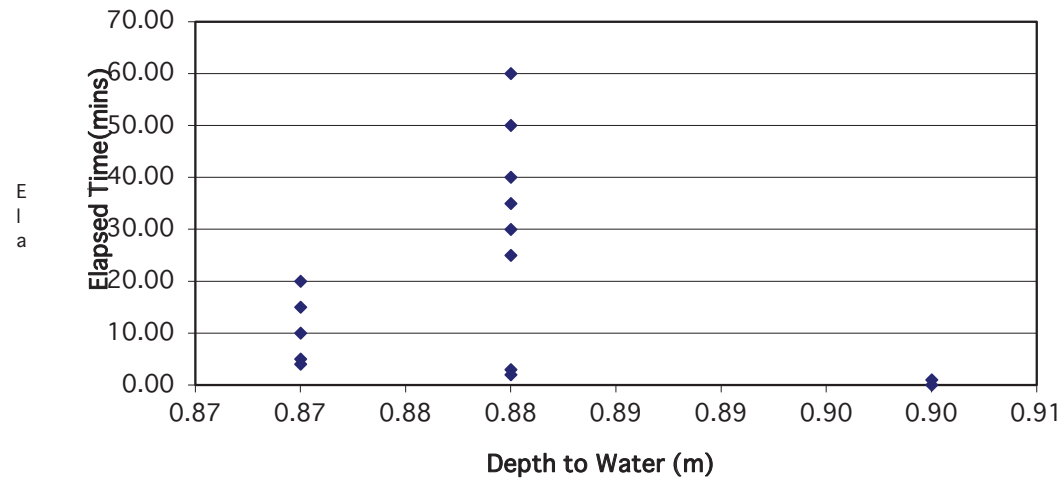
Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.60	m
Initial depth to Water =	0.90	m
Final depth to water =	0.88	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	0.64	m ²
*Av. side area of permeable stratum over test period	4.44	m ²
Total Exposed area =	5.08	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

Water level rose during test

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: 22150	Contract No: 22150
Test No. TPSA02 - Cycle 1	Northing: 734565.043
Client ARUP	Easting: 698854.613
Date: 30/10/2019	Elevation: 51.856

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy gravelly CLAY	Dry
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

Depth to Water (m)	Elapsed Time (min)
0.95	0.00
0.95	1.00
0.95	2.00
0.95	3.00
0.96	4.00
0.96	5.00
0.96	10.00
0.96	15.00
0.96	20.00
0.96	25.00
0.96	30.00
0.96	35.00
0.96	40.00
0.96	50.00
0.96	60.00

Field Test

Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.95	m
Final depth to water =	0.96	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

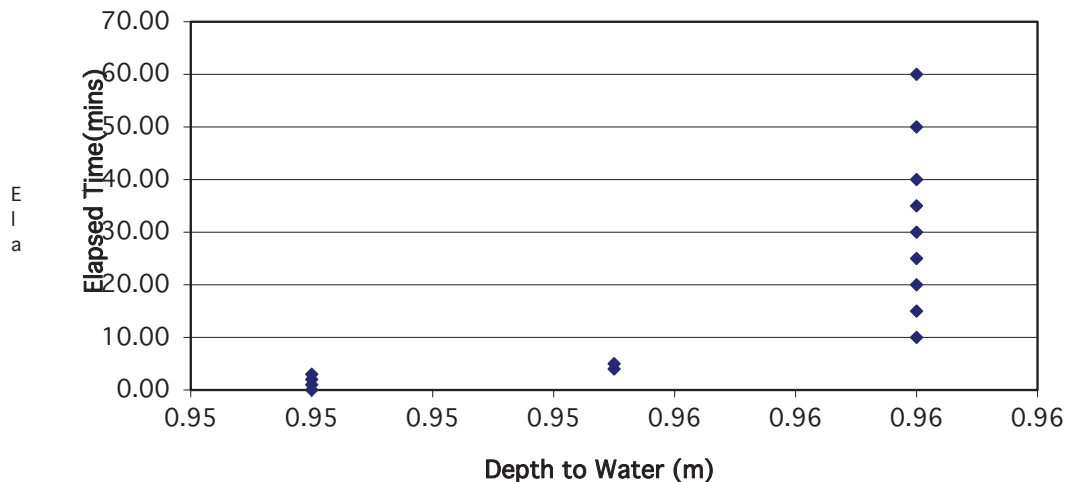
Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	4.598	m ²
Total Exposed area =	5.318	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water after 4 minutes

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: 22150	Contract No: 22150
Test No. TPSA02 - Cycle 2	Northing: 734565.043
Client ARUP	Easting: 698854.613
Date: 30/10/2019	Elevation: 51.856

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy gravelly CLAY	Dry
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

Depth to Water (m)	Elapsed Time (min)
0.83	0.00
0.83	1.00
0.83	2.00
0.84	3.00
0.84	4.00
0.84	5.00
0.84	10.00
0.84	15.00
0.84	20.00
0.84	25.00
0.84	30.00
0.84	35.00
0.84	40.00
0.84	50.00
0.84	60.00

Field Test

Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.83	m
Final depth to water =	0.84	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

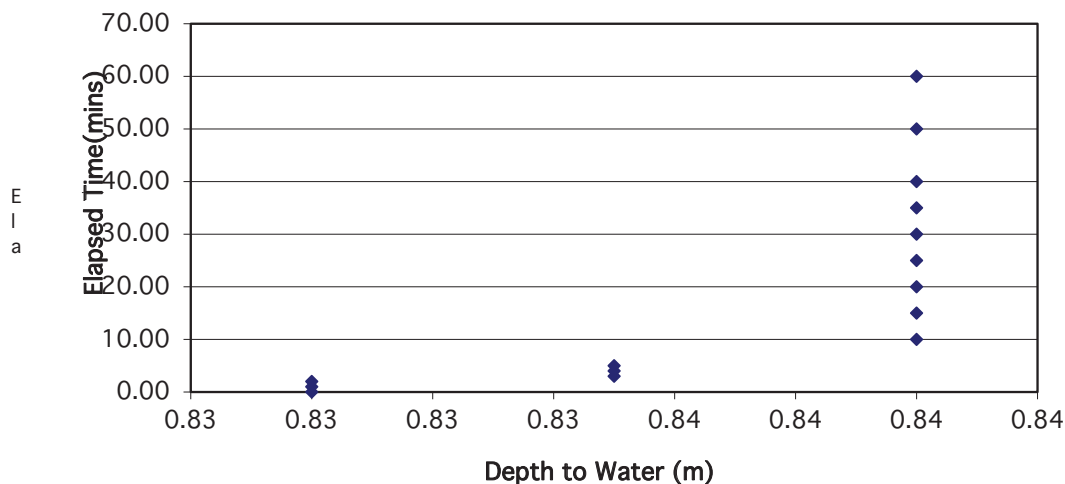
Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	5.126	m ²
Total Exposed area =	5.846	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water level after 3 mins

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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 GROUND at 0.5m
0.20	0.70	MADE GROUND comprised of brownish grey slightly sandy gravelly CLAY	
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

Depth to Water (m)	Elapsed Time (min)
0.74	0.00
0.74	1.00
0.75	2.00
0.76	3.00
0.76	4.00
0.76	5.00
0.77	10.00
0.77	15.00
0.77	20.00
0.77	25.00
0.77	30.00
0.78	35.00
0.78	40.00
0.78	50.00
0.79	60.00

Field Test

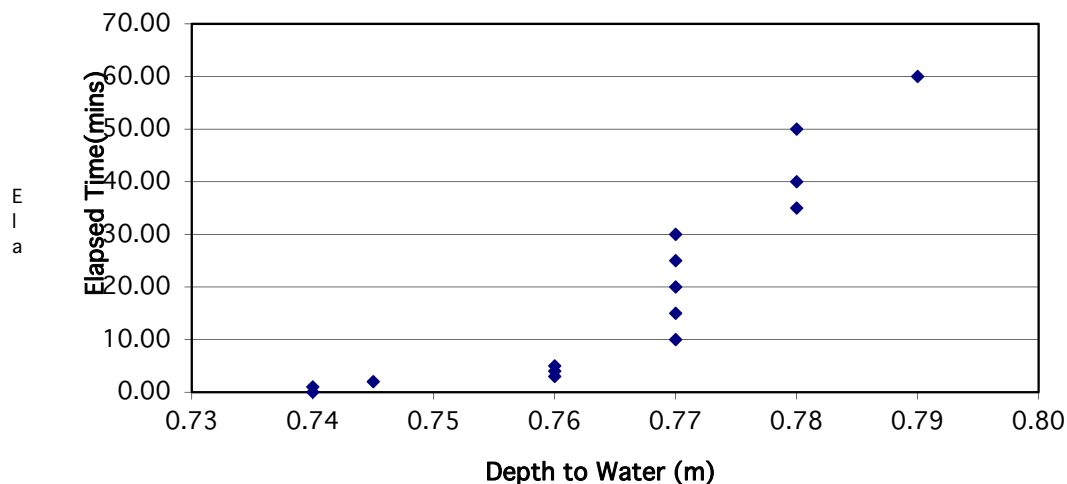
Depth of Pit (D)	1.80	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.74	m
Final depth to water =	0.79	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	4.554	m ²
Total Exposed area =	5.274	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00011 m/min or 1.896E-06 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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 GROUND at 0.5m
0.20	0.70	MADE GROUND comprised of brownish grey slightly sandy gravelly CLAY	
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

Depth to Water (m)	Elapsed Time (min)
0.90	0.00
0.90	1.00
0.90	2.00
0.91	3.00
0.91	4.00
0.91	5.00
0.92	10.00
0.92	15.00
0.92	20.00
0.93	25.00
0.93	30.00
0.93	35.00
0.94	40.00
0.94	50.00
0.94	60.00

Field Test

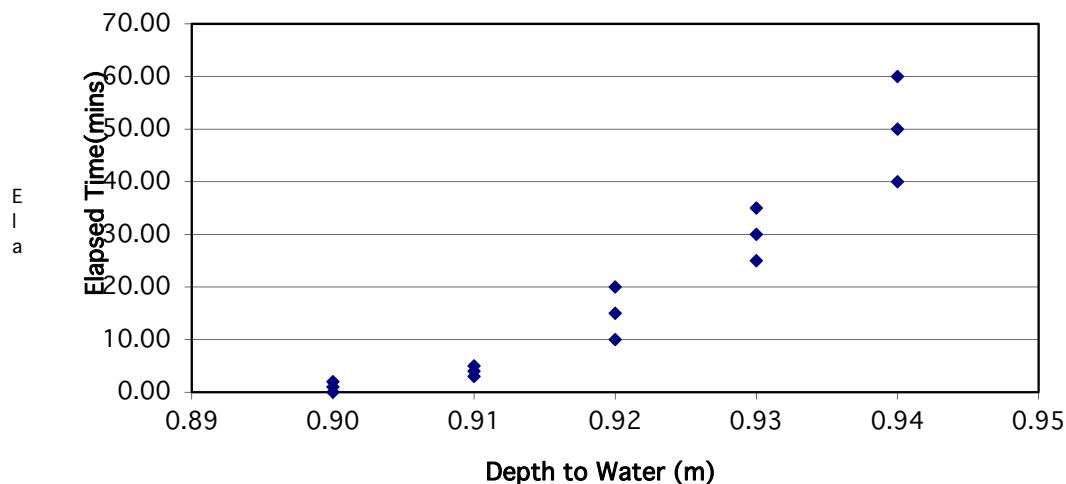
Depth of Pit (D)	1.80	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.90	m
Final depth to water =	0.94	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	3.872	m ²
Total Exposed area =	4.592	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f = 0.0001 m/min or 1.742E-06 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

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

from	to	Description	Ground water
0.00	0.30	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlets	Water Influx at 1.0m
0.30	0.90	MADE GROUND comprised of brown sandy gravelly CLAY	
0.90	2.00	MADE GROUND comprised of dark grey to black sandy very gravelly CLAY	
2.00	2.50	Firm brown mottled grey sandy gravelly CLAY	

Notes: One cycle carried out. Further cycles cancelled by Consulting Engineer due to influx of water

Field Data

Depth to Water (m)	Elapsed Time (min)
1.30	0.00
1.30	1.00
1.30	2.00
1.30	3.00
1.30	4.00
1.31	5.00
1.31	10.00
1.31	15.00
1.31	20.00
1.31	25.00
1.31	30.00
1.31	35.00
1.31	40.00
1.31	50.00
1.31	60.00

Field Test

Depth of Pit (D)	2.50	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.60	m
Initial depth to Water =	1.30	m
Final depth to water =	1.31	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m

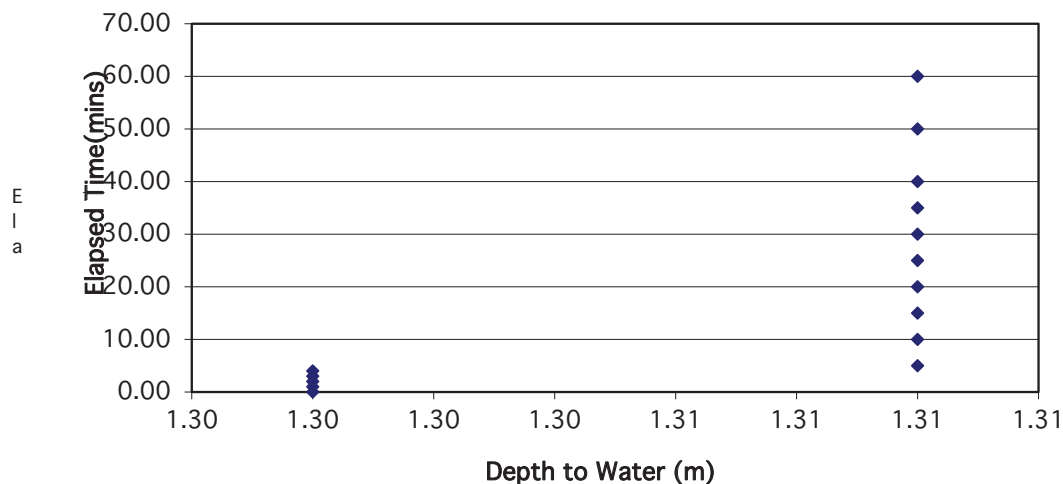
Base area=	0.64	m ²
*Av. side area of permeable stratum over test period	4.78	m ²
Total Exposed area =	5.42	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time




f= 0 m/min or 0 m/sec

No fall in water level after 4 minutes

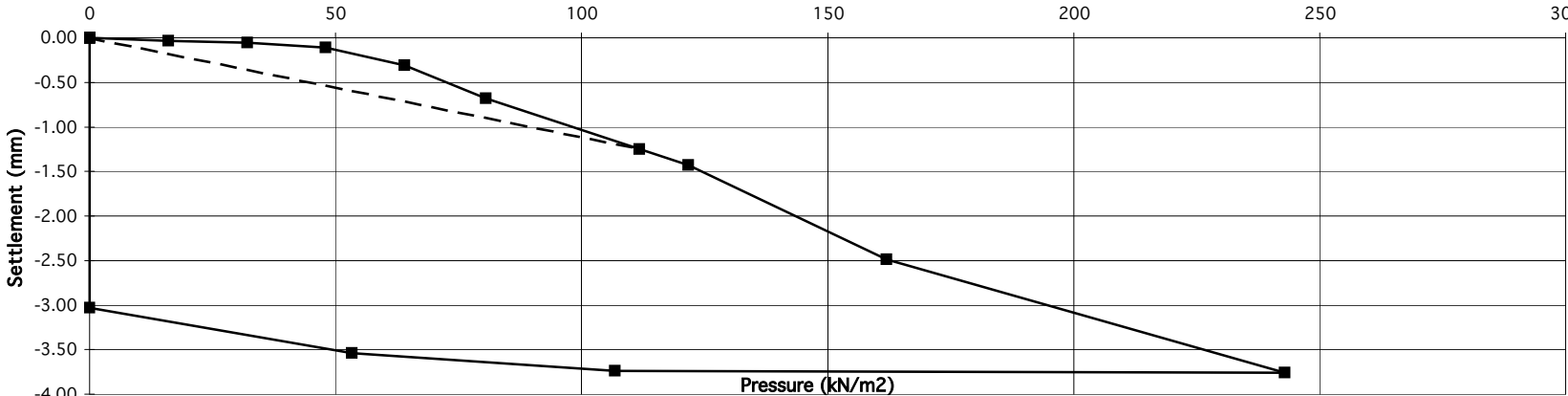
Depth of water vs Elapsed Time (mins)



RECEIVED: 18/07/2023




PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107335	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT01 Load	Firm brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698862.771
Depth	0.6m	Northing (m)	735057.67
Client	Arup	Ground Level (mOD)	50.832
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	07/11/2019		

Pressure / Settlement

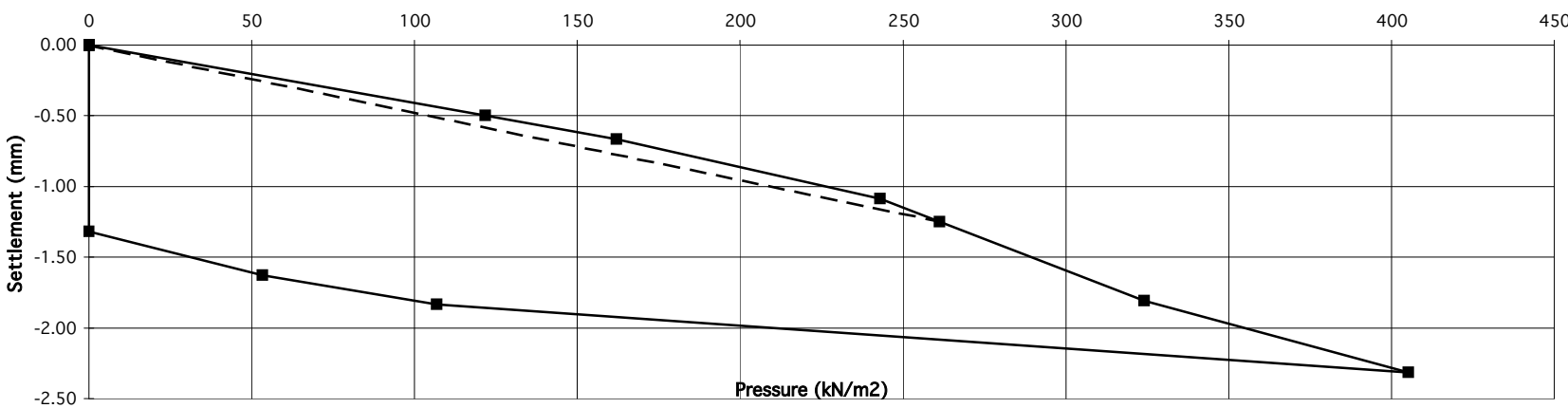


Gradient at 1.25 mm settlement intersection = 89		
Modulus of subgrade reaction = 58 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	10.8 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107355	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT01 Reload	Firm brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698862.771
Depth	0.6m	Northing (m)	735057.67
Client	Arup	Ground Level (mOD)	50.832
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	07/11/2019		

Pressure / Settlement

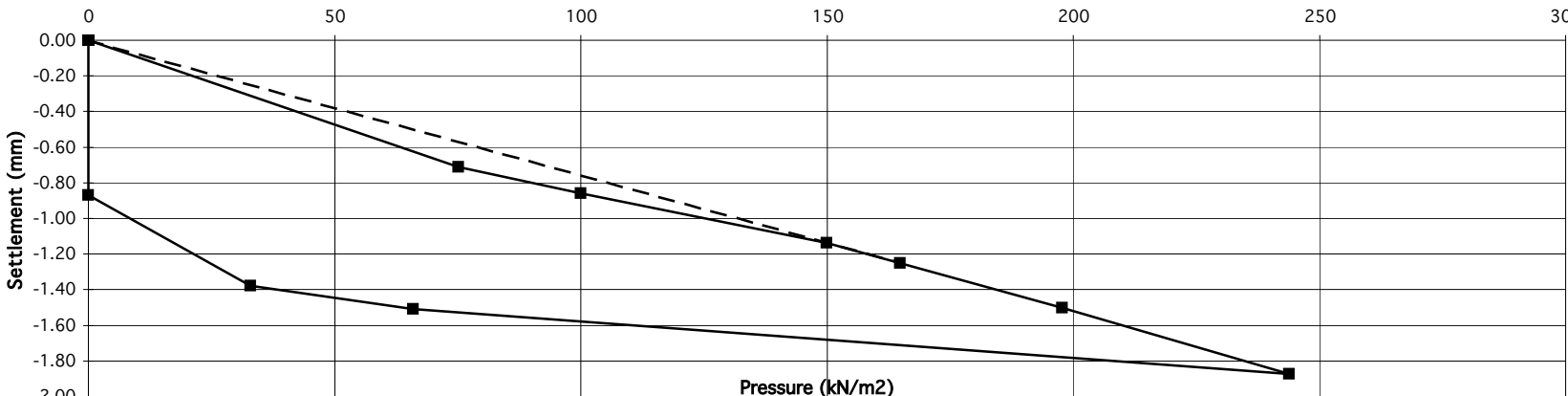


Gradient at 1.25 mm settlement intersection = 209		
Modulus of subgrade reaction = 134 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	47.0 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107336	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT03 load	Firm to stiff greyish brown slightly sandy very gravelly CLAY	
Location	See Map	Easting (m)	698715.377
Depth	0.95m	Northing (m)	734959.854
Client	Arup	Ground Level (mOD)	52.928
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	Hugh Byrne		
Date	07/11/2019		

Pressure / Settlement

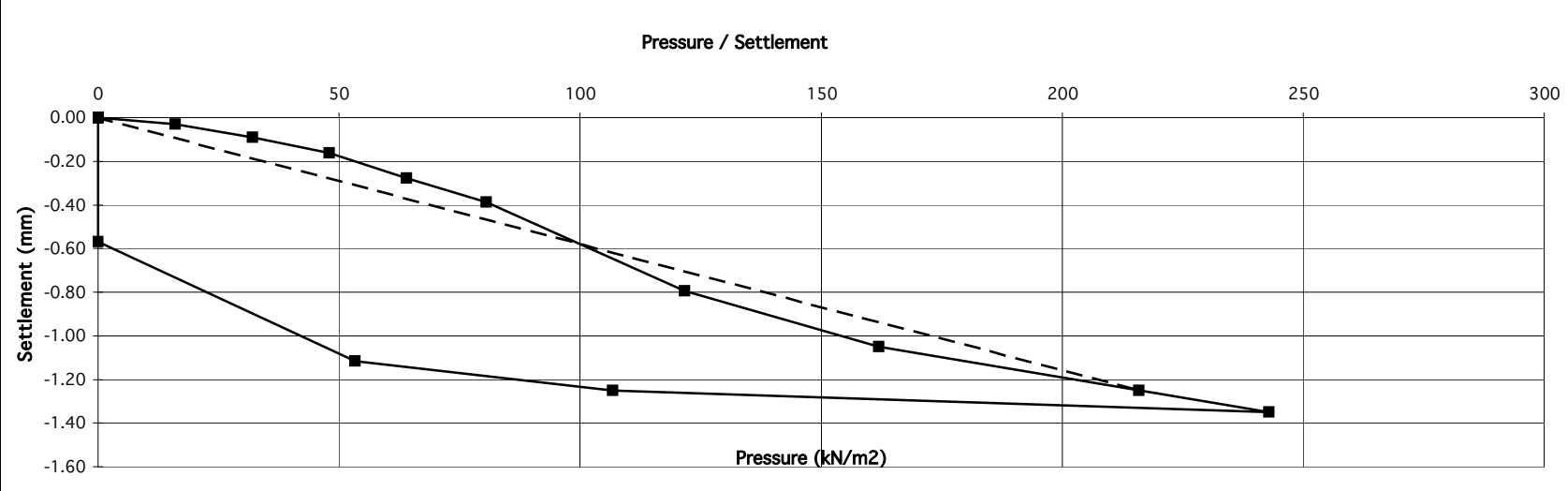


Gradient at 1.25 mm settlement intersection = 132		
Modulus of subgrade reaction = 85 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	21.2 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107336	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT03 Reload	Firm to stiff greyish brown slightly sandy very gravelly CLAY	
Location	See Map	Easting (m)	698715.377
Depth	0.95m	Northing (m)	734959.854
Client	Arup	Ground Level (mOD)	52.928
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	07/11/2019		



Pressure / Settlement



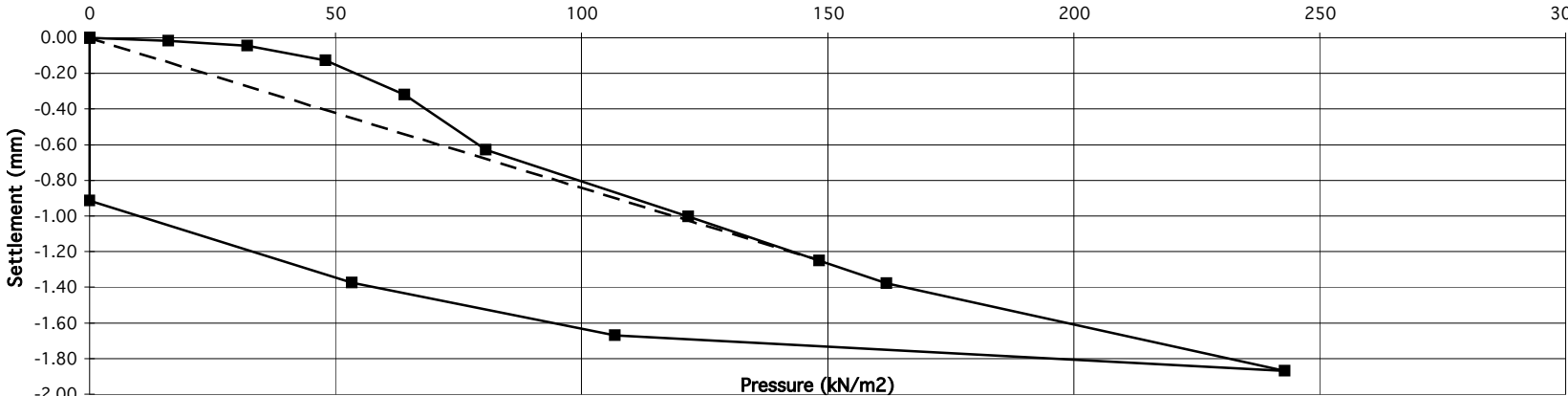
Pressure (kN/m ²)	Settlement (mm) - Solid Line 1	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line 2
0	0.00	0.00	0.00
50	-0.15	-0.30	-0.12
100	-0.35	-0.55	-0.25
150	-0.60	-0.75	-0.40
200	-0.85	-0.95	-0.55
250	-1.10	-1.15	-0.70
275	-1.35	-1.25	-0.85

Gradient at 1.25 mm settlement intersection = 173	Equivalent CBR value in accordance with NRA HD25-26/10	33.8 %
Modulus of subgrade reaction = 111 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107337	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT04 Load	Firm brown mottled grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698808.795
Depth	0.4m	Northing (m)	734863.887
Client	Arup	Ground Level (mOD)	51.555
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	07/11/2019		




Pressure / Settlement



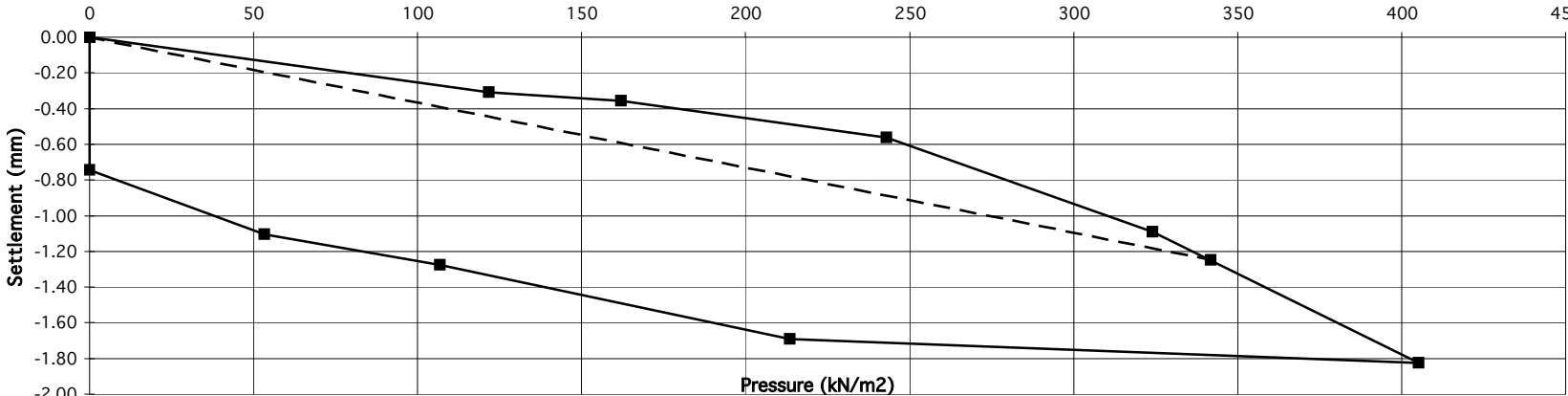
Pressure (kN/m ²)	Settlement (mm) - Curve 1 (Solid, Squares)	Settlement (mm) - Curve 2 (Dashed)	Settlement (mm) - Curve 3 (Solid, Squares)
0	0.00	0.00	0.00
50	-0.15	-0.40	-0.15
100	-0.70	-0.75	-0.70
150	-1.00	-1.00	-1.00
200	-1.30	-1.30	-1.30
250	-1.60	-1.60	-1.60
300	-1.85	-1.85	-1.85

Gradient at 1.25 mm settlement intersection = 119	Equivalent CBR value in accordance with NRA HD25-26/10	17.6 %
Modulus of subgrade reaction = 76 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107337	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT04 Reload	Firm brown mottled grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698808.795
Depth	0.4m	Northing (m)	734863.887
Client	Arup	Ground Level (mOD)	51.555
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	07/11/2019		



Pressure / Settlement



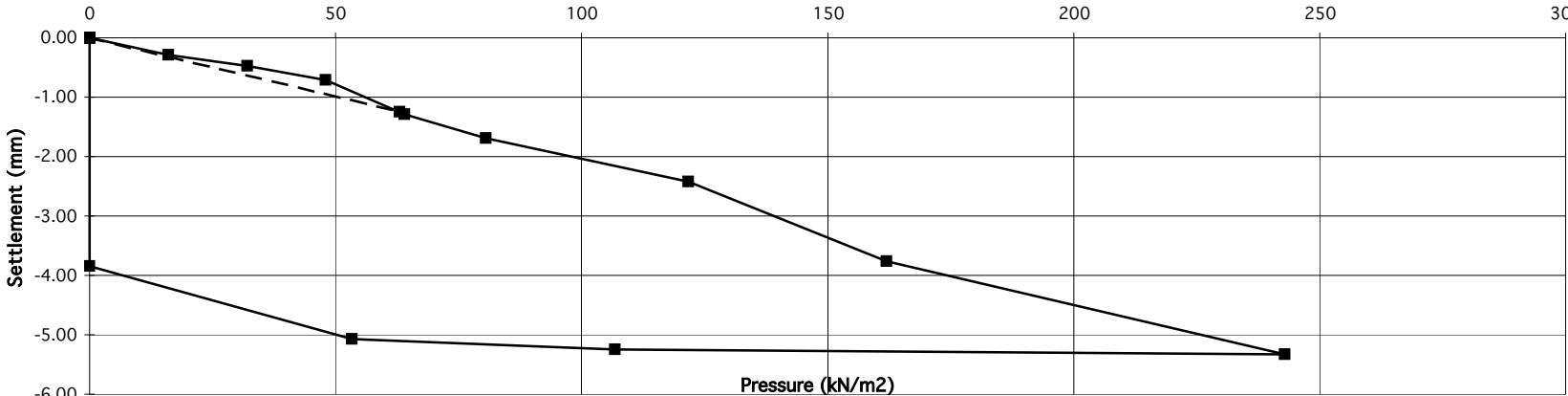
Pressure (kN/m ²)	Settlement (mm) - Solid Line (Squares)	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line (Squares)
0	0.00	0.00	0.00
50	-0.10	-0.20	-0.75
100	-0.25	-0.40	-1.10
150	-0.35	-0.55	-1.40
200	-0.45	-0.70	-1.70
250	-0.55	-0.85	-1.75
300	-0.70	-1.00	-1.78
350	-1.00	-1.15	-1.80
400	-1.30	-1.25	-1.80
450	-1.80	-1.35	-1.80

Gradient at 1.25 mm settlement intersection = 273		
Modulus of subgrade reaction = 176 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	74.9 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073358	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT05 Load	Firm brownish grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698522.695
Depth	0.6m	Northing (m)	734945.924
Client	Arup	Ground Level (mOD)	55.965
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		

Pressure / Settlement

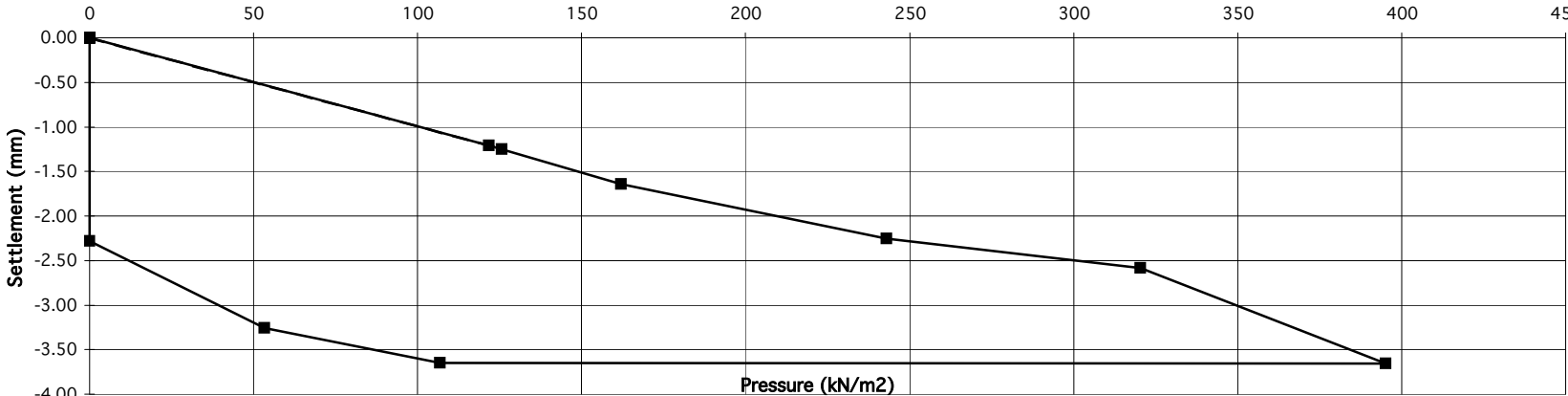


Gradient at 1.25 mm settlement intersection = 50	Equivalent CBR value in accordance with NRA HD25-26/10	4.0 %
Modulus of subgrade reaction = 32 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107338	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT05 Reload	Firm brownish grey sandy very gravelly CLAY	
Location	See Map	Easting (m)	698522.695
Depth	0.6m	Northing (m)	734945.924
Client	Arup	Ground Level (mOD)	55.965
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		



Pressure / Settlement



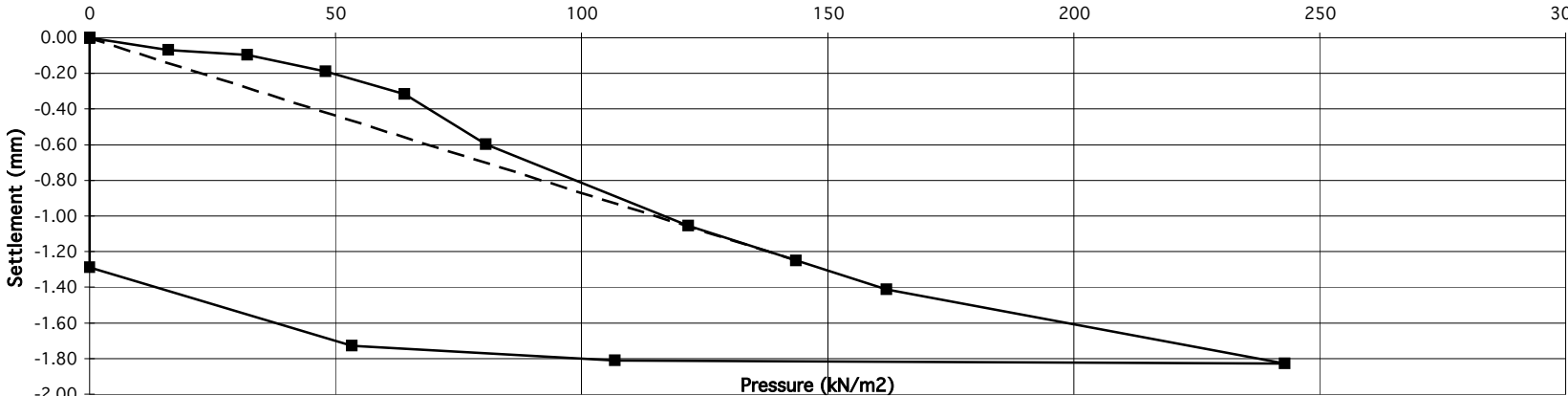
Pressure (kN/m ²)	Settlement (mm) - Upper Curve	Settlement (mm) - Lower Curve
0	0.00	-2.25
~25	-0.50	-3.25
~125	-1.25	-3.65
~160	-1.65	-3.65
~245	-2.25	-3.65
~320	-2.60	-3.65
~410	-3.65	-3.65

Gradient at 1.25 mm settlement intersection = 101	Equivalent CBR value in accordance with NRA HD25-26/10	13.2 %
Modulus of subgrade reaction = 65 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107339	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT06 Load	Firm light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698561.485
Depth	0.6m	Northing (m)	734805.081
Client	Arup	Ground Level (mOD)	54.489
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	01/11/2019		



Pressure / Settlement



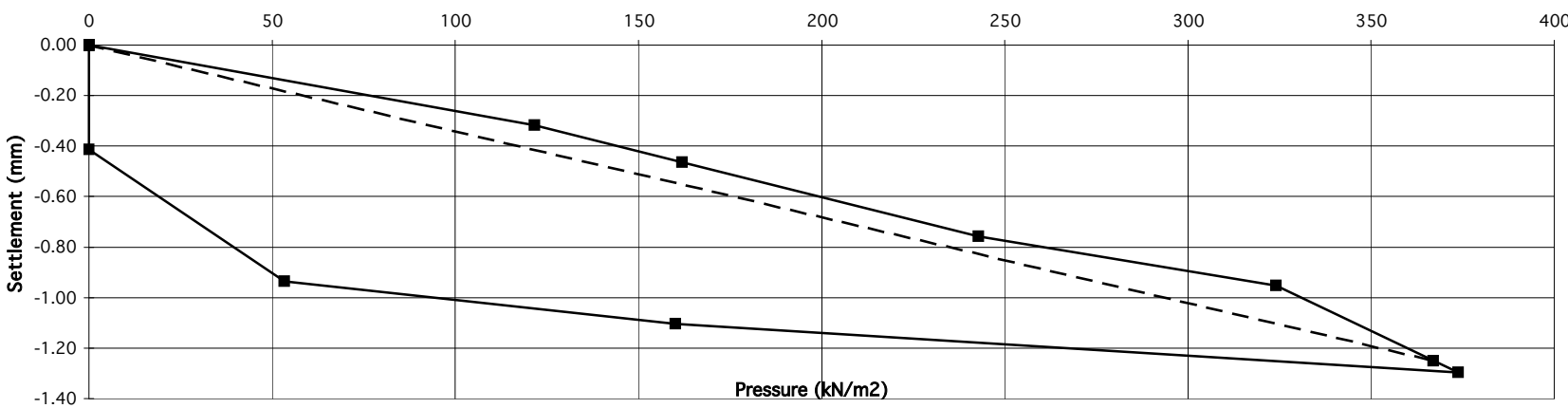
Pressure (kN/m ²)	Settlement (mm) - Solid Line (Top)	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line (Bottom)
0	0.00	0.00	0.00
25	-0.10	-0.15	-1.30
50	-0.20	-0.30	-1.75
75	-0.35	-0.50	-1.80
100	-0.60	-0.70	-1.80
125	-1.05	-0.90	-1.80
150	-1.25	-1.10	-1.80
175	-1.40	-1.30	-1.80
200	-1.55	-1.50	-1.80
225	-1.70	-1.70	-1.80
250	-1.80	-1.80	-1.80
275	-1.80	-1.80	-1.80
300	-1.80	-1.80	-1.80

Gradient at 1.25 mm settlement intersection = 115	Equivalent CBR value in accordance with NRA HD25-26/10	16.7 %
Modulus of subgrade reaction = 74 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107339	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT06 Reload	Firm light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698561.485
Depth	0.6m	Northing (m)	734805.081
Client	Arup	Ground Level (mOD)	54.489
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	01/11/2019		

Pressure / Settlement

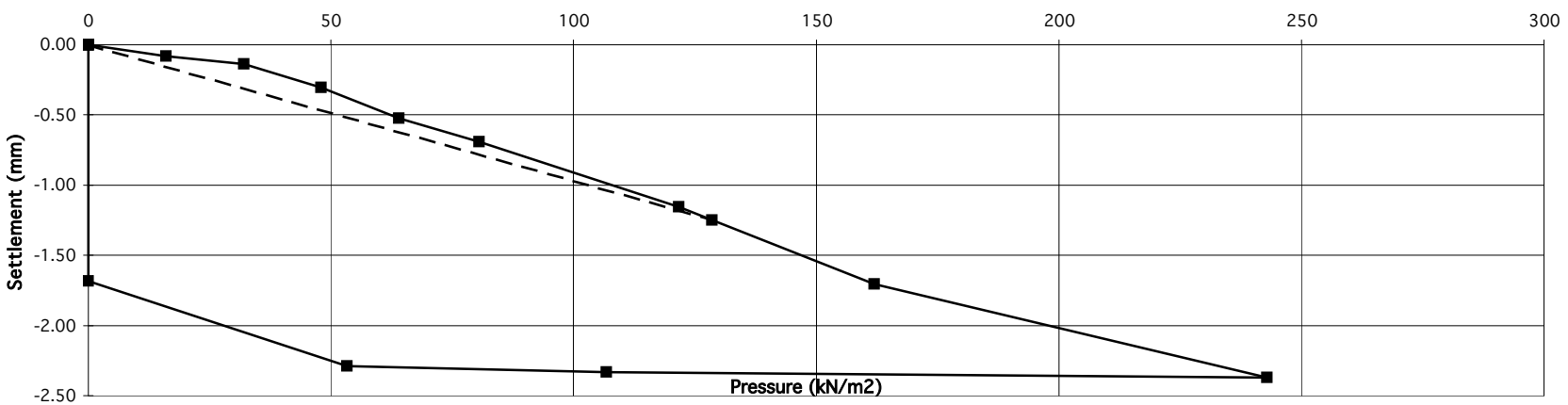


Gradient at 1.25 mm settlement intersection = 294	Equivalent CBR value in accordance with NRA HD25-26/10	84.8 %
Modulus of subgrade reaction = 189 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107340	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT07 Load	Brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698495.699
Depth	0.5m	Northing (m)	734757.261
Client	Arup	Ground Level (mOD)	54.554
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		



Pressure / Settlement

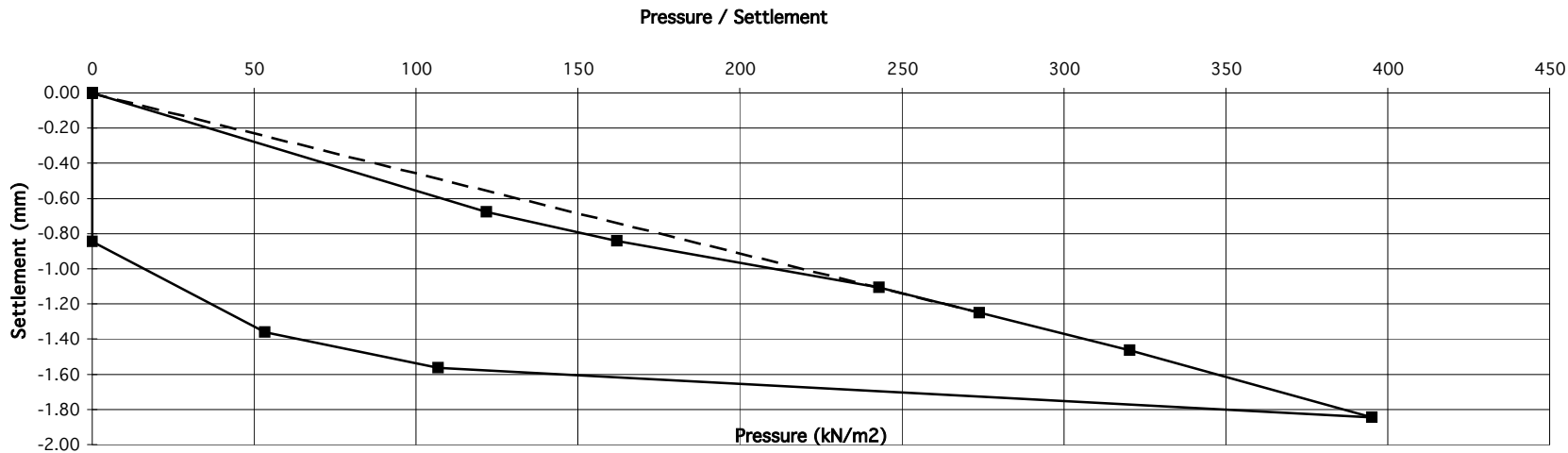


Pressure (kN/m ²)	Settlement (mm)
0	0.00
10	-0.10
20	-0.15
30	-0.25
40	-0.35
50	-0.45
60	-0.55
70	-0.65
80	-0.75
90	-0.85
100	-0.95
110	-1.05
120	-1.15
130	-1.25
140	-1.35
150	-1.45
160	-1.55
170	-1.65
180	-1.75
190	-1.85
200	-1.95
210	-2.05
220	-2.15
230	-2.25
240	-2.35
250	-2.45
260	-2.50




Gradient at 1.25 mm settlement intersection = 103	Equivalent CBR value in accordance with NRA HD25-26/10	13.8 %
Modulus of subgrade reaction = 66 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

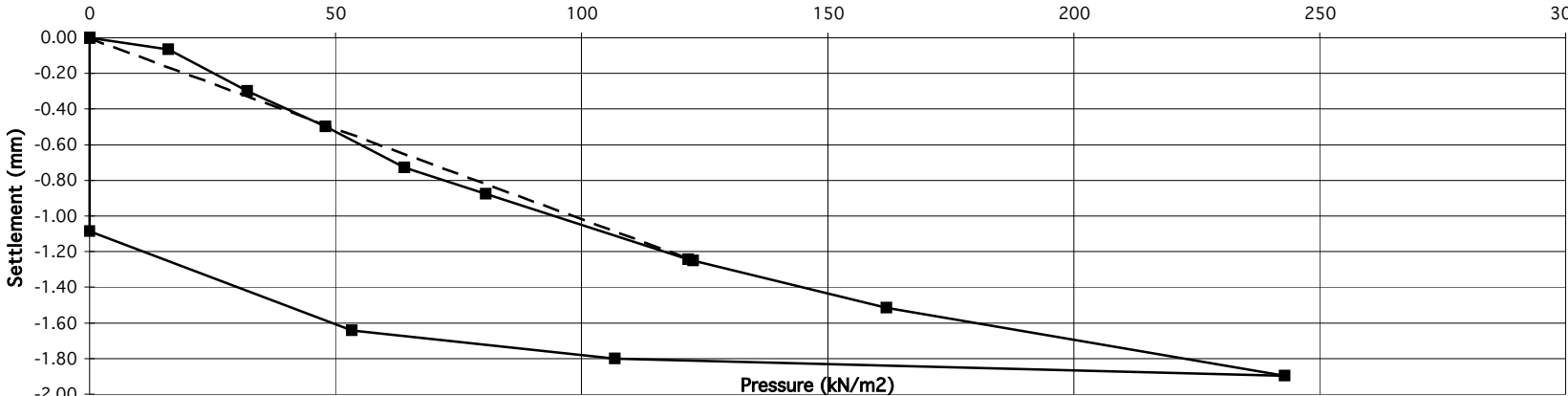
PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073341	Description of soil under test (natural soil, placed fill, sub-base)	Brown mottled grey sandy gravelly CLAY
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT07 Reload	Easting (m) 698495.699 Northing (m) 734757.261 Ground Level (mOD) 54.554	 
Location	See Map		
Depth	0.5m	Sample Ref No.	N/A
Client	Arup	Depth	0.00 m bgl
Plate Diameter:	450 mm	<p>Gradient at 1.25 mm settlement intersection = 219 Modulus of subgrade reaction = 141 MPa/m Correction factor applied = 0.64 as per HD 25-26/10</p>	
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Equivalent CBR value in accordance with NRA HD25-26/10 51.1 %	
Technician	S.Cunningham		
Authorised by	<i>[Signature]</i>		
Date	04/11/2019		



RECEIVED: 18/07/2023



PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107341	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT09 Load	Firm to stiff light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698835.693
Depth	0.5m	Northing (m)	734298.251
Client	Arup	Ground Level (mOD)	51.023
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by			
Date	05/11/2019		

Pressure / Settlement

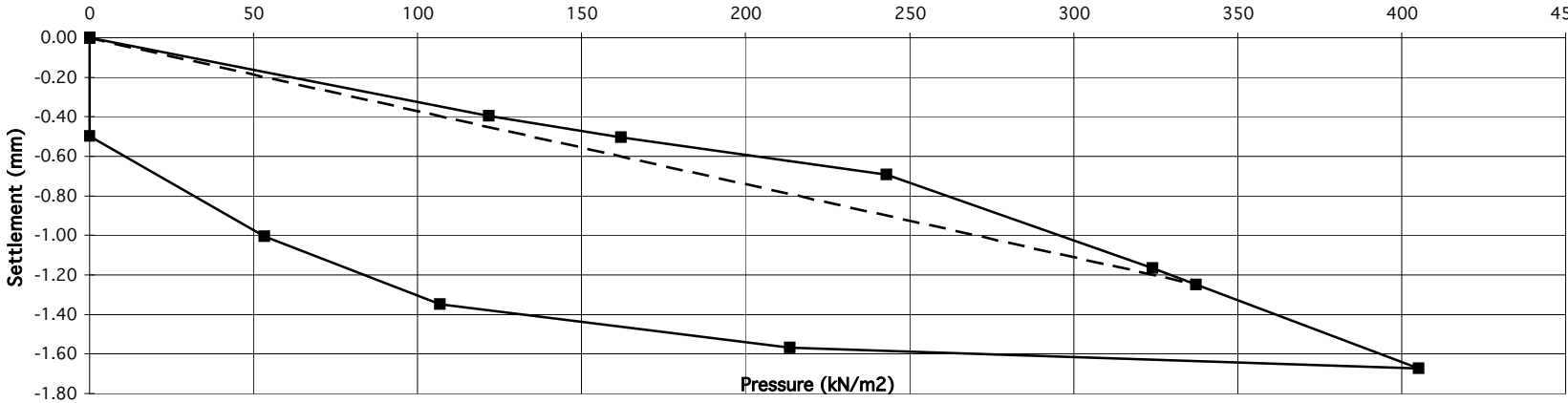


Gradient at 1.25 mm settlement intersection = 98		
Modulus of subgrade reaction = 63 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10	12.7 %
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R1073341	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT09 Reload	Firm to stiff light brown mottled grey sandy gravelly CLAY	
Location	See Map	Easting (m)	698835.693
Depth	0.5m	Northing (m)	734298.251
Client	Arup	Ground Level (mOD)	51.023
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	V.Lowe		
Authorised by	<i>[Signature]</i>		
Date	05/11/2019		



Pressure / Settlement



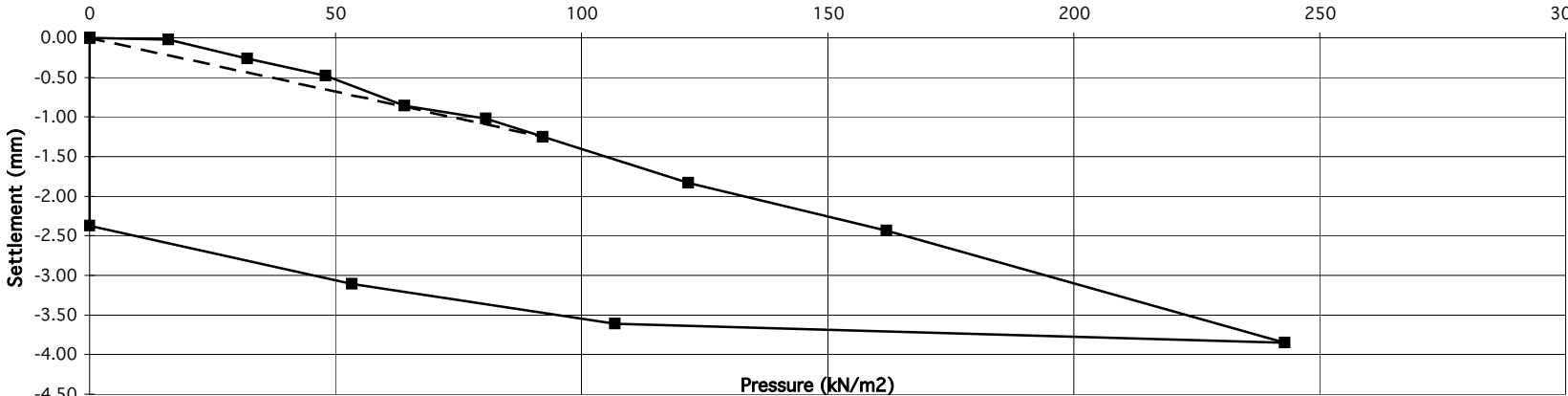
Pressure (kN/m ²)	Settlement (mm) - Solid Line	Settlement (mm) - Dashed Line
0	0.00	0.00
50	-1.00	-0.20
100	-1.35	-0.40
150	-1.50	-0.55
200	-1.58	-0.70
250	-1.62	-0.85
300	-1.65	-1.00
350	-1.66	-1.15
400	-1.67	-1.30
450	-1.68	-1.45

Gradient at 1.25 mm settlement intersection = 270	Equivalent CBR value in accordance with NRA HD25-26/10	73.3 %
Modulus of subgrade reaction = 174 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107342	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT10 Load	Firm brown sandy gravelly CLAY	
Location	See Map	Easting (m)	699053.493
Depth	0.4m	Northing (m)	734505.499
Client	Arup	Ground Level (mOD)	48.577
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by	<i>S.Cunningham</i>		
Date	31/10/2019		




Pressure / Settlement



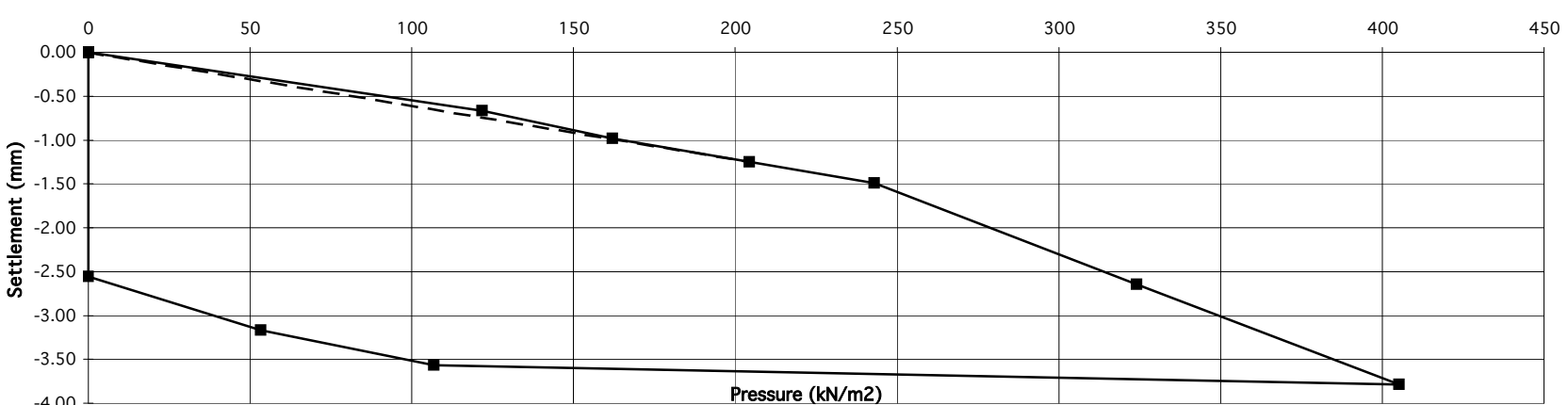
Pressure (kN/m ²)	Settlement (mm) - Dashed Line	Settlement (mm) - Solid Line 1	Settlement (mm) - Solid Line 2
0	0.00	0.00	-2.50
50	-0.50	-0.50	-3.10
100	-1.00	-1.00	-3.60
125	-1.10	-1.80	-3.70
150	-1.20	-2.40	-3.75
200	-1.30	-3.20	-3.80
250	-1.40	-3.80	-3.80

Gradient at 1.25 mm settlement intersection = 74	Equivalent CBR value in accordance with NRA HD25-26/10	7.7 %
Modulus of subgrade reaction = 47 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

RECEIVED: 18/07/2023

PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R107342	Description of soil under test (natural soil, placed fill, sub-base)	 
Contract	22150 - Liffey Park Technology Campus		
Test No.	PT10 Reload	Firm brown sandy gravelly CLAY	
Location	See Map	Easting (m)	699053.493
Depth	0.4m	Northing (m)	734505.499
Client	Arup	Ground Level (mOD)	48.577
Plate Diameter:	450 mm	Sample Ref No.	N/A
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test	Depth	0.00 m bgl
Technician	S.Cunningham		
Authorised by			
Date	31/10/2019		

Pressure / Settlement



Gradient at 1.25 mm settlement intersection = 163	
Modulus of subgrade reaction = 105 MPa/m	Equivalent CBR value in accordance with NRA HD25-26/10
Correction factor applied = 0.64 as per HD 25-26/10	30.7 %



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP01
LOGGED BY Victoria Lowe	CO-ORDINATES 698,862.77 E 735,057.67 N	SHEET Sheet 1 of 1
		DATE STARTED 07/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 50.83	DATE COMPLETED 07/11/2019
		EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND: TARMACADAM	[Cross-hatch pattern]								
	MADE GROUND comprised of medium dense black sandy clayey GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.		0.10	50.73						
	MADE GROUND comprised of medium dense dark grey sandy GRAVEL. Sand is fine to medium. Gravel is subangular, fine to medium.		0.40	50.43						
	Geomembrane	[Dotted pattern]	0.55	50.28		AA123646	B	0.50		
1.0	Firm brown mottled grey sandy gravelly CLAY with a high cobble content. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular.	[Horizontal lines with circles]								
	Geomembrane	[Dotted pattern]				AA123647	B	1.10		
	Firm grey mottled black slightly sandy very gravelly CLAY with a medium cobble content and a medium boulder content, with occasional very large boulders >600mm. Sand is fine to medium. Gravel is subangular, fine to coarse. Cobbles are rounded to angular. Boulders are rounded to subrounded.	[Horizontal lines with circles and larger shapes]	1.30	49.53						
	End of Trial Pit at 1.50m	[Horizontal lines with circles and larger shapes]	1.50	49.33	↓ (Rapid)	AA123648	B	1.40		
2.0										
3.0										

Groundwater Conditions
Fast inflow at 1.5mbgl

Stability
Unstable at 1.4mbgl

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

RECEIVED: 18/10/2023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP02
LOGGED BY Victoria Lowe		SHEET Sheet 1 of 1
CO-ORDINATES 698,897.79 E 734,973.03 N		DATE STARTED 31/10/2019
GROUND LEVEL (m) 50.03		DATE COMPLETED 31/10/2019
CLIENT ENGINEER O' Flynn Group Arup	EXCAVATION METHOD JCB 8T	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy clay with occasional roots and rootlets.									
	MADE GROUND comprised of medium dense black sandy clayey GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.		0.30	49.73		AA118621	Env	0.15		
	Firm to stiff dark brown mottled grey slightly sandy gravelly CLAY with a low cobble content and occasional boulders. Sand is fine to medium. Gravel is subrounded to subangular, fine to coarse. Cobbles are subrounded to subangular. Boulders are rounded to subrounded.		0.40	49.63						
	Stiff black slightly sandy gravelly CLAY with a high cobble and medium boulder content. Sand is fine to coarse. Gravel is subrounded to subangular, fine to coarse. Cobbles are subrounded to subangular. Boulders are rounded to subrounded.		0.55	49.48		AA118622 AA118623	B B	0.70 0.70		
1.0	End of Trial Pit at 1.70m		1.70	48.33		AA118624 AA118625	B B	1.70 1.70		
2.0										
3.0										

Groundwater Conditions
Dry

Stability
Stable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP03
LOGGED BY Sean Cunningham	CO-ORDINATES 698,715.38 E 734,959.85 N	SHEET Sheet 1 of 1
		DATE STARTED 01/11/2019 DATE COMPLETED 01/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 52.93	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND: TARMACADAM	[Cross-hatch pattern]								
	MADE GROUND comprised of a compact light grey clayey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium. (Binding layer)	[Cross-hatch pattern]	0.10	52.83						
	MADE GROUND comprised of medium dense black sandy clayey GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.	[Cross-hatch pattern]	0.25	52.68		AA108753	B	0.20		
	MADE GROUND comprised of coarse subrounded to rounded clayey GRAVEL.	[Cross-hatch pattern]	0.50	52.43		AA108754	B	0.40		
	Firm to stiff greyish brown slightly sandy very gravelly CLAY with a high cobble and a medium boulder content and occasional large boulders. Sand is fine to medium. Gravel is subangular to subrounded, fine to coarse. Cobbles are subrounded to subangular. Boulders are rounded to subrounded.	[Stippled pattern with circles]	0.85	52.08		AA108755	B	0.70		
1.0	Liner grid	[Stippled pattern with circles]								
		[Stippled pattern with circles]				AA108756	B	1.50		
2.0		[Stippled pattern with circles]								
		[Stippled pattern with circles]				AA108757	B	2.30		
	End of Trial Pit at 2.50m	[Stippled pattern with circles]	2.50	50.43						
3.0										

Groundwater Conditions
Dry

Stability
Slightly unstable in made ground.

General Remarks



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP04
LOGGED BY Victoria Lowe	CO-ORDINATES 698,808.80 E 734,863.89 N	SHEET Sheet 1 of 1
		DATE STARTED 07/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 51.56	DATE COMPLETED 07/11/2019
		EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND: TARMACADAM									
	MADE GROUND comprised of medium dense black sandy clayey GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.		0.10	51.46						
	Firm brown mottled grey sandy gravelly CLAY with a high 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. Geomembrane		0.30	51.26		AA123642	B	0.20		
	Firm grey mottled black slightly sandy very gravelly CLAY with a medium cobble content and a medium boulder content. Sand is fine to medium. Gravel is subangular, fine to coarse. Cobbles are rounded to angular. Boulders are rounded to subrounded.		0.90	50.66		AA123643	B	0.70		
1.0			1.60	49.96		AA123644	B	1.20		
	Stiff black sandy very gravelly CLAY with a high cobble and medium boulder content. Sand is fine to medium. Gravel is subangular, fine to coarse. Cobbles are rounded to angular. Boulders are rounded to subrounded.		1.80	49.76		AA123645	B	1.70		
2.0	End of Trial Pit at 1.80m									
3.0										

Groundwater Conditions
Dry

Stability
Slightly unstable to 0.3m. Stable below

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

RECEIVED: 18/10/2023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP05
LOGGED BY Sean Cunningham	CO-ORDINATES 698,522.70 E 734,945.92 N	SHEET Sheet 1 of 1
		DATE STARTED 04/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 55.97	DATE COMPLETED 04/11/2019
		EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy clay with occasional roots and rootlets.									
	SUBSOIL: Brown sandy gravelly CLAY.		0.25	55.72						
	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						
1.0						AA116285	B	1.10		
	Firm to stiff brownish grey sandy very gravelly CLAY with medium. Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium.		1.70	54.27						
2.0					↓ (Seepage)	AA116286	B	2.20		
	End of Trial Pit at 2.60m		2.60	53.37						
3.0										

Groundwater Conditions
Groundwater at 2.1mbgl

Stability
Slightly unstable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

REF ID: A181072023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP06
LOGGED BY Victoria Lowe	CO-ORDINATES 698,561.49 E 734,805.08 N	SHEET Sheet 1 of 1
		DATE STARTED 01/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 54.49	DATE COMPLETED 01/11/2019
		EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND comprised of loose grey sandy GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.		0.25	54.24		AA108758	B	0.20		
	MADE GROUND comprised of sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		0.55	53.94		AA108759	B	0.40		
	Firm light brown mottled grey sandy gravelly CLAY with a high cobble content. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular.		0.80			AA103760	B	0.80		
1.0						AA108760	B	0.80		
	Firm to stiff black slightly sandy gravelly CLAY with a high cobble and boulder content <350mm. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		1.40	53.09						
						AA103761	B	1.70		
2.0	End of Trial Pit at 1.90m		1.90	52.59		AA108761	B	1.70		

Groundwater Conditions
Seepage in made ground

Stability
Unstable in made ground. Stable below.

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

REF ID: A181072023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP07
LOGGED BY Sean Cunningham	CO-ORDINATES 698,495.70 E 734,757.26 N	SHEET Sheet 1 of 1
		DATE STARTED 04/11/2019 DATE COMPLETED 04/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 54.55	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND comprised of medium dense black sandy clayey GRAVEL. Sand is medium to fine. Gravel is subangular to subrounded, fine to medium.									
	MADE GROUND comprised of subrounded to rounded coarse GRAVEL.		0.30	54.25		AA116287	B	0.20		
	Firm brown mottled grey sandy gravelly CLAY with a high 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	54.15		AA116288	B	0.40		
1.0						AA116289	B	1.00		
	End of Trial Pit at 1.60m		1.60	52.95						
2.0										
3.0										

Groundwater Conditions
Dry

Stability
Unstable in made ground.

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

REF ID: A181072023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP08
LOGGED BY Sean Cunningham	CO-ORDINATES 698,657.13 E 734,528.32 N	SHEET Sheet 1 of 1
		DATE STARTED 05/11/2019 DATE COMPLETED 05/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 54.11	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy clay with occasional roots and rootlets.									
0.25	MADE GROUND comprised of brown sandy gravelly 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.		0.25	53.86						
0.50						AA116273	B	0.50		
1.0	Firm to stiff brown mottled grey slightly sandy gravelly CLAY with medium cobble and boulder content		1.0							
1.50				52.61		AA116274	B	1.00		
1.50			1.50							
1.50						AA116275 AA116276	B B	1.50 1.50		
2.0	Firm to stiff brown mottled grey sandy gravelly CLAY with a high 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. End of Trial Pit at 2.60m		2.30	51.81						
2.30						AA116277 AA116278	B B	2.30 2.30		
2.60			2.60	51.51						

Groundwater Conditions
Medium seepage at 1.2m

Stability
Stable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

REF ID: 181072023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP09
LOGGED BY Victoria Lowe	CO-ORDINATES 698,835.69 E 734,298.25 N	SHEET Sheet 1 of 1
		DATE STARTED 05/11/2019 DATE COMPLETED 05/11/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 51.02	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy clay with occasional roots and rootlets.									
	SUBSOIL: Brown sandy gravelly CLAY.		0.20	50.82						
	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. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		0.45	50.57						
							AA116279 AA116280	B B	0.70 0.70	
1.0					 1 (Moderate) 2 (Rapid)					
2.0										
	Stiff dark grey to black sandy very gravelly CLAY with a medium cobble and boulder content. Sand is fine to medium. Gravel is subangular, fine to medium. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		2.40	48.62						
							AA116281 AA116282	B B	2.00 2.00	
			2.70	48.32						
	End of Trial Pit at 2.70m									
3.0										

Groundwater Conditions
Medium seepage at 1.1m. Fast inflow at 1.3m

Stability
Unstable at 1.1m

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19

REF ID: A181072023



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP10
LOGGED BY Sean Cunningham	CO-ORDINATES 699,053.49 E 734,505.50 N	SHEET Sheet 1 of 1
		DATE STARTED 29/10/2019 DATE COMPLETED 29/10/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 48.58	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)	
						Sample Ref	Type	Depth			
0.0	<p>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 subrounded to subrounded.</p> <p>SUBSOIL: Light grey sandy CLAY.</p> <p>Firm brown mottled grey sandy gravelly CLAY with low 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.</p> <p>Firm greyish brown sandy gravelly CLAY with a medium cobble content and occasional boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.</p>		0.25	48.33		AA118605	B	0.20			
			0.35	48.23							
			0.45	48.13							
1.0						AA118606	B	0.80			
			1.45	47.13							
						AA118607	B	1.60			
2.0											
					↓ (Seepage)	AA118608	B	2.60			
3.0	End of Trial Pit at 2.70m		2.70	45.88							

Groundwater Conditions
Moist at 2.5m. Seepage at 2.6m.

Stability
Slightly unstable to 0.25m. Stable after 0.25m

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TP11
LOGGED BY Sean Cunningham	CO-ORDINATES 699,023.51 E 734,676.58 N	SHEET Sheet 1 of 1
		DATE STARTED 31/10/2019 DATE COMPLETED 31/10/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 50.00	EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy CLAY									
	MADE GROUND comprised of dark grey to black sandy gravelly CLAY with a low cobble content and boulder content (<500mm) with occasional plastic wire, wood fragments, breeze blocks and large pieces of polystyrene. (Reworked black boulder CLAY)		0.25	49.75		AA118614	B	0.50		
1.0	Reinforced concrete and polystyrene					AA118615	B	1.00		
	MADE GROUND comprised of loose to medium dense clayey very gravelly SAND with occasional polystyrene fragments. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium.		1.50	48.50		AA118616	B	1.50		
2.0	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.		2.10	47.90		AA118617 AA118618	B B	2.60 2.60		
3.0	End of Trial Pit at 3.20m		3.20	46.80		AA118619 AA118620	B B	3.20 3.20		

Groundwater Conditions
Dry

Stability
Very unstable at 1.1m

General Remarks
Reinforced concrete and polystyrene at 1.3m

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TPSA01
LOGGED BY Sean Cunningham		SHEET Sheet 1 of 1
CO-ORDINATES 698,516.40 E 735,156.12 N		DATE STARTED 06/11/2019
GROUND LEVEL (m) 56.20		DATE COMPLETED 06/11/2019
CLIENT ENGINEER O' Flynn Group Arup	EXCAVATION METHOD JCB 8T	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlets.									
	SUBSOIL: Brown sandy gravelly CLAY.		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	B	0.50		
1.0	Firm to stiff dark 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.		1.20	55.00		AA128607	B	1.00		
						AA128608	B	1.50		
2.0						AA128609	B	2.00		
	End of Trial Pit at 2.45m		2.45	53.75						

Groundwater Conditions
Dry

Stability
Stable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TPSA02
LOGGED BY Sean Cunningham	CO-ORDINATES 698,854.61 E 734,565.04 N	SHEET Sheet 1 of 1
		DATE STARTED 30/10/2019
CLIENT ENGINEER O' Flynn Group Arup	GROUND LEVEL (m) 51.86	DATE COMPLETED 30/10/2019
		EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
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.		0.30	51.56		AA118609	B	0.60		
1.0	Firm grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded.		1.20	50.66	↓ (Seepage)	AA118610	B	1.30		
	Firm to stiff brown mottled grey slightly sandy gravelly CLAY with a medium cobble content and occasional boulders <500mm. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		1.50	50.36		AA118611	B	1.80		
2.0						AA118612	B	2.60		
3.0	End of Trial Pit at 2.90m		2.90	48.96						

Groundwater Conditions
Seepage at 1.0m and 1.2m

Stability
Stable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus		TRIAL PIT NO. TPSA03
LOGGED BY Sean Cunningham		SHEET Sheet 1 of 1
CO-ORDINATES 699,153.06 E 734,803.73 N		DATE STARTED 29/10/2019
GROUND LEVEL (m) 49.26		DATE COMPLETED 29/10/2019
CLIENT ENGINEER O' Flynn Group Arup	EXCAVATION METHOD JCB 8T	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy CLAY with occasional rootlets.									
	MADE GROUND comprised of brownish grey slightly sandy gravelly CLAY with rare plastic and wood fragments. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		0.20	49.06	↓ (Seepage)	AA118601	B	0.30		
	Firm brown mottled black sandy gravelly CLAY with a medium cobble content and occasional boulders <450mm. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		0.60	48.66		AA118602	B	0.80		
1.0	Firm to stiff dark grey slightly sandy very gravelly CLAY with a medium cobble content and occasional boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		1.50	47.76		AA118603	B	1.70		
2.0	End of Trial Pit at 2.90m		2.90	46.36		AA118604	B	2.80		
3.0										

Groundwater Conditions
Seepage at 0.5m

Stability
Stable

General Remarks

IGSL TP LOG 22150.GPJ IGSL.GDT 25/11/19



TRIAL PIT RECORD

REPORT NUMBER

22150

CONTRACT Liffey Park Technology Campus

TRIAL PIT NO. **TPSA04**

SHEET Sheet 1 of 1

LOGGED BY Victoria Lowe

CO-ORDINATES 699,223.71 E
735,091.01 N

DATE STARTED 06/11/2019

DATE COMPLETED 06/11/2019

CLIENT ENGINEER O' Flynn Group
Arup

GROUND LEVEL (m) 50.93

EXCAVATION METHOD JCB 8T

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Brown slightly sandy CLAY with occasional roots and rootlets.									
	MADE GROUND comprised of brown sandy gravelly CLAY with geomembrane and occasional brick fragments. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.		0.30	50.63		AA128601	B	0.20		
	MADE GROUND comprised of dark grey to black sandy very gravelly CLAY with a medium cobble and boulder content with concrete and plastic fragments. (Reworked black boulder CLAY)		0.90	50.03	↓ (Seepage)	AA128602	B	0.60		
1.0										
	Firm brown mottled grey sandy gravelly CLAY with low 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.		1.90	49.03		AA128603	B	1.40		
2.0										
	Stiff black sandy gravelly CLAY with a medium cobble content and a medium boulder content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse. Cobble is subrounded to subangular. Boulders are rounded to subrounded.		2.50	48.43		AA128604	B	2.20		
	End of Trial Pit at 2.70m		2.70	48.23		AA128605	B	2.60		
3.0										

Groundwater Conditions
Seepage at 0.9m

Stability
Stable

General Remarks

REVISION: 18/07/2023