

## Appendix C

GI factual report

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**S.I. Ltd Contract No: 5840**

Client: Digital Realty  
Engineer: Arup  
Contractor: Site Investigations Ltd

**DUB15 Digital Realty,**  
**Profile Park, Grange Castle, Co. Dublin**  
**Site Investigation Report**

Prepared by:

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Stephen Letch

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### **1. Introduction**

On the instructions of Arup, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Profile Park, Grange Castle, Co. Dublin. The investigation was completed for a new Data Centre on the site and was completed on behalf of the Client, Digital Realty. The investigation was completed in April 2021.

### **2. Site Location**

The site is located in Profile Park, Grange Castle in west Co. Dublin, to the West of Clondalkin, North of Newcastle and South of Lucan. The map of the Dublin (below left) shows the site location in west Co. Dublin and the second map shows the boundary of the site.



### **3. Fieldwork**

The fieldworks comprised a programme of cable percussive boreholes with rotary coreholes, trial pits, soakaway tests, foundation pits, plate tests and gas and groundwater monitoring. All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2<sup>nd</sup> Edition 2016 and Eurocode 7: Geotechnical Design.

The fieldworks comprised the following:

- 5 No. cable percussive boreholes with rotary coreholes
- 17 No. trial pits
- 2 No. soakaway tests
- 3 No. foundation pits

- 4 No. plate tests

### 3.1. Cable Percussion Boreholes with Rotary Coreholes

Cable percussion boring was undertaken at 5 No. locations using a Dando 150 rig and constructed 200mm diameter boreholes. After CAT scanning the locations, hand dug inspection pits were excavated to 1.20mbgl to check for underground services. The boreholes terminated at depths ranging from 2.30mbgl (BH103) to 3.60mbgl (BH105) when obstructions were encountered. It was not possible to collect undisturbed samples due to the granular soils encountered so bulk disturbed samples were recovered at regular intervals with environmental samples collected at shallow depths.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g., BH101 at 1.00mbgl where N=13(1,2/3,3,3,4). Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g., BH101 at 2.90mbgl where N=50-(25 for 5mm/50 for 50mm)).

Following completion of the boreholes, rotary coreholes were completed adjacent to the cable percussive boreholes to investigate the depth and type of bedrock. The rotary drilling was carried out using a Sondeq SS71 top drive rig. Open hole drilling techniques were used to advance through the overburden and bedrock was recovered from 3.60mbgl (BH105) to 5.40mbgl (BH101). The bedrock was then cored and the corehole terminated when 3m of core was recovered.

Three were installed in the boreholes, BH102 in the overburden, BH103 and BH104 in the bedrock and consisted of slotted pipe surrounded by a gravel response zone with bentonite seals.

Once the coreholes were completed, the rock cores were returned to SIL, where they were logged and photographed by a SIL geotechnical engineer. Provided on the logs are engineering geological descriptions of the rock cores with details of the bedding/discontinuities and mechanical indices for each core run, i.e., TCR, SCR, RQD and Fracture Index.

The combined cable percussive borehole and rotary corehole logs are presented in Appendix 1 along with the rotary core photographs.

### **3.2. Trial Pits**

17 No. trial pits were excavated using a tracked excavator. The strata were logged and photographed by SIL geotechnical engineer and groundwater ingresses and pit wall stability was also recorded. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

The trial pit logs and photographs are presented in Appendix 2.

### **3.3. Soakaway Tests**

At two locations, soakaway tests were completed and logged by SIL geotechnical engineer. The soakaway test is used to identify possible areas for storm water drainage. The pit was filled with water and the level of the groundwater was recorded over time. As stipulated by BRE Special Digest 365, the pit should be filled three times and that the final cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The results and photographs are provided in Appendix 3.

### **3.4. Foundation Pits**

At two locations and TP104, 3 No. foundation pits were excavated to investigate the depths of wall foundations on the site. This included hand excavating around the foundation to measure the depth to the top, extension out from the wall and the thickness of the foundation. The pits were then photographed, backfilled with arisings and reinstated.

The foundation pit logs are presented in Appendix 4.

### **3.5. Plate Tests**

At four trial pit locations, TP102, TP107, TP110 and TP117, plate tests were completed to provide a California Bearing Ratio value for pavement design. The tests were completed at 0.50mbgl and the 13T tracked excavator was used to provide kentledge. Pressure is then added to a 600mm diameter plate, via a hydraulic jack, with the settlement of the plate measured using gauges. The rate of settlement is used to calculate the CBR value.

The plate test results are provided in Appendix 5.

### **3.6. Groundwater and Gas Monitoring**

Following the completion of the fieldworks, a series of groundwater measurements was completed. For the first set of readings, the water level was measured and then the water was purged and sampled for groundwater testing. At the time of the second set of groundwater

readings, a gas monitor was brought to site and a set of gas readings were taken prior to the groundwater measurements. A third and final set of groundwater readings were subsequently taken for the final report.

The groundwater and gas readings are presented in Appendix 6.

### **3.7. Surveying**

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 11.

## **4. Laboratory Testing**

### **4.1. Geotechnical testing**

Laboratory testing has been performed on representative soil samples recovered from the trial pits and these were completed in accordance of BS1377: 1990 or the relevant specification.

Testing included:

- 53 No. Moisture contents
- 48 No. Atterberg limits
- 25 No. Particle size gradings with 21 No. hydrometers
- 20 No. pH
- 20 No. Water soluble sulphate
- 20 No. Chloride content tests

Rock testing was completed on the core recovered and consisted of the following:

- 3 No. Unconfined compressive strength tests
- 6 No. Point Loads

The soil laboratory test results are presented in Appendix 7 with the rock test results in Appendix 8.

### **4.2. Environmental Testing**

Soil environmental testing was completed by Eurofins Chemtest Ltd. and consisted of the following:

- 66 No. Suite E and Suite E.1 analysis
- 20 No. Acid soluble sulphate
- 20 No. Total sulphur tests

- 20 No. Magnesium tests
- 20 No. Nitrate content

Groundwater samples were recovered from two standpipes and testing was completed by Eurofins Chemtest Ltd, consisting of the following:

- 2 No. Suite F analysis

The soil environmental laboratory test results are reported in Appendix 9 and the groundwater analysis will be provided in Appendix 10.



**Appendix 1**  
**Cable Percussive Borehole and Rotary Corehole Logs**  
**and Photographs**

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Contract No: 5840	<b>Cable Percussion and Rotary Corehole Log</b>				Corehole No: BH101
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Contract:	DUB15 Digital Realty	Easting:	703949.344	Date Started:	21/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730370.977	Date Completed:	21/04/2021
Client:	Digital Realty	Elevation:	76.41	Drilled By:	G. Macken / MEDL
Engineer:	Arup	Rig Type:	Dando 150 / Sondeq	Status:	FINAL


Scale	Depth	Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill	
				Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m		
	0.20	TOPSOIL.			76.21							
	0.5	Firm brown slightly sandy gravelly silty CLAY with low cobble content.			76.0	ES / 0.50						
	1.0				75.5	N=13 (1,2/3,3,3,4) B / 1.00 ES / 1.00						
	1.40	Stiff dark grey slightly sandy gravelly silty CLAY with low cobble content.			75.0							
	1.5				74.5	N=17 (4,3/6,4,3,4) B / 2.00 ES / 2.00						
	2.0				74.0							
	2.5				73.71							
	2.70	Obstruction - boulders.			73.51	50 (25 for 5mm/50 for 5mm)						
	2.90	Open hole drilling: driller reports returns of black sandy gravelly silty CLAY with cobbles and boulders.			73.5							
	3.0				73.0							
	3.5				72.5							
	4.0				72.0							
	4.5				71.5							
	5.0				71.0							
	5.40	Strong light grey fine grained muddy LIMESTONE interbedded with moderately strong dark grey calcareous MUDSTONE with some calcite veins (<20mm) and pyrite crystals. Fresh to slightly weathered.			71.01							
	6.0	<i>Discontinuities - smooth, occasionally rough, planar to slightly undulating, tight to open, sub-vertical, occasionally sub-horizontal dip, clean with occasional clay infill</i>			70.5	5.40 - 6.40	96	60	13	15		
	6.5	<i>Discontinuities - smooth to rough, planar to slightly undulating, tight to open, sub-vertical, occasionally sub-horizontal and 20 to 40° dip, clean surfaces</i>			70.0							
	7.0				69.5	6.40 - 7.40	95	83	64	10		
	7.5				69.0							
	7.85	<i>Discontinuities - smooth, planar, tight, 10 to 20° dip, clean surfaces.</i>			68.56	7.40 - 8.40	95	86	62	35		
	8.0	Moderately strong to strong dark grey calcareous MUDSTONE with some pyrite crystals. Fresh to slightly weathered.			68.01					2		
	8.40	<i>Discontinuities - smooth, planar and stepped, tight to open, 10 to 20° and occasional sub-vertical dip, clean surfaces.</i>			68.0							
		End of Corehole at 8.40m			67.5							
	9.0				67.0							
	9.5				66.5							

	Chiselling:			Water Strikes:			Water Details:			Installations:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water
	From:	To:	Time:	Strike:	Rose:	Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Cable percussive borehole terminated due to boulders		
	2.70	2.90	01:00				21/04	2.90	Dry				0.00	8.40	Arisings			

Contract No: 5840	<b>Cable Percussion and Rotary Corehole Log</b>				Corehole No: BH102
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Contract:	DUB15 Digital Realty	Easting:	703944.087	Date Started:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730308.876	Date Completed:	20/04/2021
Client:	Digital Realty	Elevation:	76.78	Drilled By:	G. Macken / MEDL
Engineer:	Arup	Rig Type:	Dando 150 / Sondeq	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
				Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
	0.20	TOPSOIL.			76.58						
	0.5	MADE GROUND: brown slightly sandy gravelly silty CLAY with low cobble content.			76.5	ES / 0.50					
	1.0				76.0						
	1.5				75.5	N=15 (2,2/4,3,3,5) B / 1.00 ES / 1.00					
	2.0				75.0						
	2.5				74.5	N=14 (4,5/3,3,3,5) B / 2.00 ES / 2.00					
	2.60	Stiff dark grey slightly sandy slightly gravelly silty CLAY with low cobble content.			74.18						
	3.0				74.0						
	3.5				73.5	N=28 (6,5/5,8,8,7) B / 3.00 ES / 3.00					
	3.50	Obstruction - boulders.			73.28						
	3.60	Open hole drilling: driller reports returns of black sandy gravelly silty CLAY with cobbles and boulders.			73.18	50 (25 for 5mm/50 for 0mm)					
	4.0				73.0						
	4.40	Moderately strong dark grey calcareous MUDSTONE. Fresh to slightly weathered.			72.5						
	4.5				72.38						
	4.70	<i>Discontinuities - non-intact.</i>			72.0						Ni
	5.0	Strong light grey fine grained muddy LIMESTONE interbedded with moderately strong dark grey calcareous MUDSTONE with some calcite veins (<5mm) and occasional pyrite crystals. Fresh to slightly weathered.			71.5	4.40 - 5.40	95	68	54		3
	5.5	<i>Discontinuities - smooth, planar to slightly undulating and stepped, tight to open, sub-horizontal and 20 to 30° dip, clean and occasionally stained grey surfaces.</i>			71.0						
	6.0	<i>Discontinuities - smooth, planar to slightly undulating, tight to open, sub-horizontal and 20 to 30° dip, occasionally sub-vertical, clean and occasionally stained grey surfaces.</i>			70.5	5.40 - 6.40	95	70	37		18
	6.5	<i>Discontinuities - smooth to rough, planar to slightly undulating, tight to open, sub-horizontal and sub-vertical dip, clean and occasionally stained grey surfaces.</i>			70.0						
	7.0				69.5	6.40 - 7.40	94	84	84		2
	7.40	End of Corehole at 7.40m			69.38						
	7.5				69.0						
	8.0				68.5						
	8.5				68.0						
	9.0				67.5						
	9.5				67.0						

	Chiselling:			Water Strikes:			Water Details:			Installations:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water
	From:	To:	Time:	Strike:	Rose:	Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Cable percussive borehole terminated due to boulders.		
	3.50	3.60	01:00	3.30	3.00	NS	20/04	3.60	2.80	0.00	1.50	Solid	0.00	1.00	Bentonite			
										1.50	3.60	Slotted	1.00	3.60	Gravel			
													3.60	7.40	Bentonite			

Contract No: 5840	<b>Cable Percussion and Rotary Corehole Log</b>				Corehole No: BH103
Contract:	DUB15 Digital Realty	Easting:	703917.958	Date Started:	21/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730204.224	Date Completed:	21/04/2021
Client:	Digital Realty	Elevation:	78.01	Drilled By:	G. Macken / MEDL
Engineer:	Arup	Rig Type:	Dando 150 / Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
	0.20	TOPSOIL.			77.81						
	0.5	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.			77.5	ES / 0.50					
	1.0				77.0	N=13 (3,5/5,2,3,3) B / 1.00 ES / 1.00					
	1.30	Firm grey slightly sandy gravelly silty CLAY with low cobble content.			76.71						
	1.5				76.5						
	1.80	Stiff dark grey slightly sandy gravelly silty CLAY with low cobble content.			76.21						
	2.0				76.0	50 (5,18/50 for 50mm) B / 2.00 ES / 2.00 B / 2.20 50 (25 for 5mm/50 for 5mm)					
	2.20	Obstruction - boulders.			75.81						
	2.30	Open hole drilling: driller reports returns of black sandy gravelly silty CLAY with cobbles and boulders.			75.71						
	2.5				75.5						
	3.0				75.0						
	3.5				74.5						
	4.0				74.0						
	4.10	Strong light grey fine grained muddy LIMESTONE interbedded with moderately strong dark grey calcareous MUDSTONE with some calcite veins (<10mm) and pyrite crystals. Fresh to slightly weathered.			73.91						
	4.5				73.5	4.10 - 5.10	95	92	43	14	
	5.0	<i>Discontinuities - smooth, planar, tight to open, 20 to 30° dip, clean and occasionally stained grey surfaces.</i>			73.0						
	5.5	<i>Discontinuities - smooth, planar to slightly undulating, tight to open, 30 to 45° dip, occasionally 60°, clean and occasionally stained grey surfaces</i>			72.5	5.10 - 6.10	95	84	71	7	
	6.0				72.0						
	6.5				71.5	6.10 - 7.10	94	78	59	0	
	7.0	<i>Discontinuities - rough, planar, tight to open, sub-horizontal dip, clean surfaces</i>			71.0						
	7.10	End of Corehole at 7.10m			70.91						
	7.5				70.5						
	8.0				70.0						
	8.5				69.5						
	9.0				69.0						
	9.5				68.5						

	<b>Chiselling:</b>			<b>Water Strikes</b>			<b>Water Details:</b>			<b>Installations:</b>			<b>Backfill:</b>			<b>Remarks:</b> Cable percussive borehole terminated due to boulders	<b>Legend:</b> B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water
	From:	To:	Time:	Strike:	Rose:	Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	2.20	2.30	01:00				21/04	2.30	Dry	0.00	4.10	Solid	0.00	3.10	4.10		

Contract No: 5840		<b>Cable Percussion and Rotary Corehole Log</b>					Corehole No: BH104				
Contract: DUB15 Digital Realty			Easting: 703912.249		Date Started: 20/04/2021						
Location: Profile Park, Grange Castle, Co. Dublin			Northing: 730287.189		Date Completed: 20/04/2021						
Client: Digital Realty			Elevation: 76.69		Drilled By: G. Macken / MEDL						
Engineer: Arup			Rig Type: Dando 150 / Sondeq		Status: FINAL						
Depth (m)	Stratum Description		Legend	Level (mOD)		Samples	Rock Indices				Backfill
	Scale	Depth		Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
0.20	TOPSOIL.			76.5	76.49						
0.5	MADE GROUND: brown slightly sandy gravelly silty CLAY with low cobble content.			76.0		ES / 0.50					
1.0				75.5		N=10 (1,2/2,2,3,3) B / 1.00 ES / 1.00					
1.5				75.0							
2.0				74.5		N=12 (4,4/4,3,2,3) B / 2.00 ES / 2.00					
2.30	Stiff dark grey slightly sandy slightly gravelly silty CLAY with low cobble content.			74.0	74.39						
2.5				73.5		50 (3, 10/50 for 200mm) B / 3.00 ES / 3.00					
3.0				73.0		50 (25 for 5mm/50 for 5mm) B / 3.50					
3.40	Obstruction - boulders.			73.29							
3.50	Open hole drilling: driller reports returns of black sandy gravelly silty CLAY with cobbles and boulders.			73.19							
4.0				72.5							
4.5				72.0	71.99						
4.70	Moderately strong dark grey calcareous MUDSTONE interbedded with strong light grey fine grained muddy LIMESTONE with some pyrite crystals. Fresh to slightly weathered.			71.5		4.70 - 5.70	98	54	13		
5.0	<i>Discontinuities - smooth, planar, tight to open, 20 to 50° and sub-vertical dip, clean and occasionally stained grey surfaces with some clay infill</i>			71.0						Ni	
5.5				70.5		5.70 - 6.70	100	66	45		
6.0				70.0	70.39						
6.30	Strong light grey fine grained muddy LIMESTONE interbedded with moderately strong dark grey calcareous MUDSTONE with occasional calcite veins (<20mm) and pyrite crystals. Fresh to slightly weathered.			69.5		6.70 - 7.70	100	100	99		6
6.5	<i>Discontinuities - smooth to rough, planar to undulating and occasionally stepped, tight to open, 20 to 30° and sub-vertical dip, clean surfaces.</i>			69.0	68.99						
7.0	End of Corehole at 7.70m			68.5							
7.5				68.0							
8.0				67.5							
8.5				67.0							
9.0											
9.5											

	Chiselling:		Water Strikes:			Water Details:			Installations:			Backfill:			Remarks:		Legend: B Bulk D Disturbed U: Undisturbed ES Environmental W: Water
	From:	To:	Time:	Strike:	Rose:	Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Cable percussive borehole terminated due to boulders	
	0.60	0.80	01:00	2.90	2.60	NS	20/04	3.50	2.20	0.00	4.70	Solid	0.00	3.70	4.70		
3.40	3.50	01:00							4.70	7.70	Slotted	3.70	4.70	4.70	7.70	Bentonite Gravel	



Contract No: 5840	<b>Cable Percussion and Rotary Corehole Log</b>				Corehole No: BH105
Contract:	DUB15 Digital Realty	Easting:	703829.758	Date Started:	21/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730237.061	Date Completed:	21/04/2021
Client:	Digital Realty	Elevation:	77.86	Drilled By:	J. O'Toole / MEDL
Engineer:	Arup	Rig Type:	Dando 150 / Sondeq	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples	Rock Indices				Backfill
Scale	Depth			Scale	Depth		TCR/%	SCR/%	RQD/%	FI/m	
0.5	0.50	MADE GROUND: grey silty slightly sandy gravel with low cobble content.		77.5	77.36	ES / 0.50					
1.0	1.40	MADE GROUND: brown slightly sandy gravelly silty CLAY with low cobble content.		77.0	76.46	N=10 (2,2/2,2,3,3) B / 1.00 ES / 1.00					
1.5	1.70	Firm brown slightly sandy gravelly silty CLAY with low cobble content.		76.5	76.16						
2.0	2.50	Firm dark grey slightly sandy gravelly silty CLAY with low cobble content.		76.0	75.36	N=15 (5,12/4,3,3,5) B / 2.00 ES / 2.00					
2.5	3.60	Stiff dark grey slightly sandy gravelly silty CLAY with low cobble content.		75.5	74.26						
3.0	3.60	Very strong light grey fine grained muddy LIMESTONE interbedded with moderately strong dark grey calcareous MUDSTONE with some calcite veins (<30mm) and occasional pyrite crystals. Fresh to slightly weathered. <i>Discontinuities - smooth to rough, planar, tight to open, 45 to 60° dip, clean and occasionally stained grey surfaces</i>		75.0	74.0	B / 3.60 50 (25 for 5mm/50 for 5mm) 3.60 - 4.60	92	81	16	13	
3.5	3.60	<i>Discontinuities - smooth to rough, planar, tight to open, 45 to 60° dip, clean and occasionally stained grey surfaces and some clay infill</i>		74.0	73.0						
4.0	3.60	<i>Discontinuities - non-intact</i>		73.5	72.5	4.60 - 5.60	93	76	67	4	
4.5	3.60	<i>Discontinuities - smooth to rough, planar, tight to open, 45 to 85° dip, clean and occasionally stained grey surfaces and occasionally filled with pyrite crystal veins.</i>		73.0	72.0						
5.0	3.60			72.5	72.0	5.60 - 6.60	94	62	54	8	
5.5	3.60	End of Corehole at 6.60m		72.0	71.26						
6.0	3.60			71.5	71.0						
6.5	3.60			71.0	70.5						
7.0	3.60			70.5	70.0						
7.5	3.60			70.0	69.5						
8.0	3.60			69.5	69.0						
8.5	3.60			69.0	68.5						
9.0	3.60			68.5	68.0						
9.5	3.60			68.0							
	3.60										

	Chiselling:			Water Strikes			Water Details:			Installations:			Backfill:			Remarks:	Legend B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water
	From:	To:	Time:	Strike:	Rose:	Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Cable percussive borehole terminated due to bedrock.	
	3.60	3.60	01:00	3.60	3.00	NS	21/04	3.60	2.80				0.00	6.60	Arisings		

BH101 Box 1 of 1



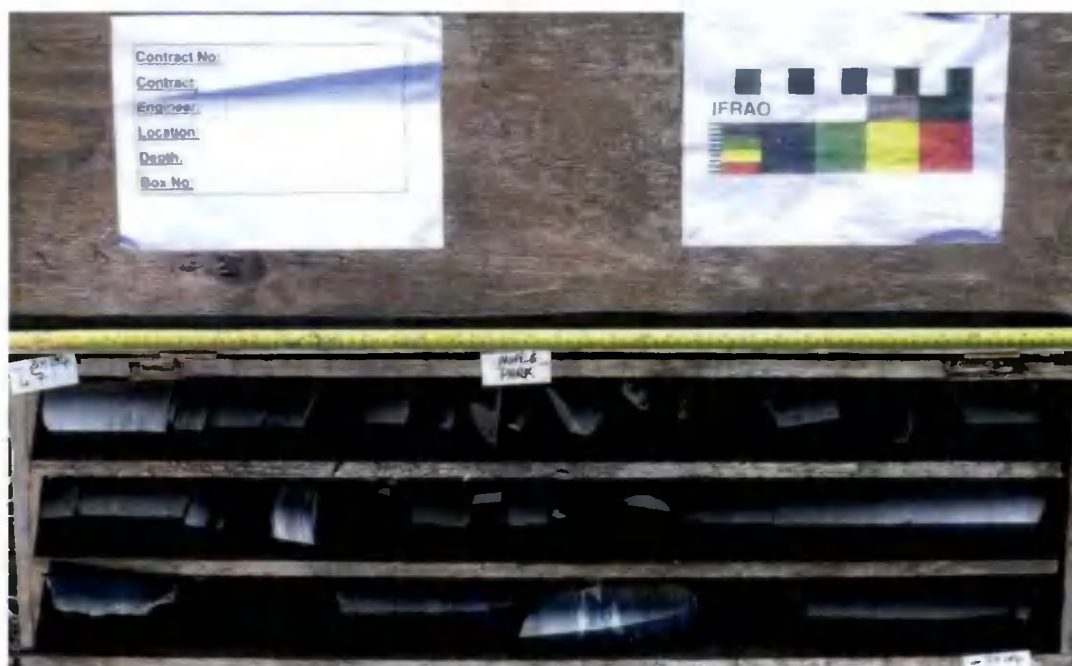
BH102 Box 1 of 1



**BH103 Box 1 of 1**



**BH104 Box 1 of 1**





**BH105 Box 1 of 1**

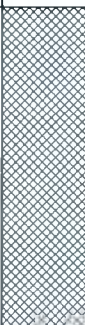
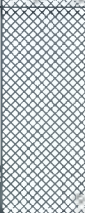




**Appendix 2**  
**Trial Pit Logs and Photographs**

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Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP101</b>
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Contract:	DUB15 Digital Realty	Easting:	703942.020	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730419.368	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	76.11	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.80 x 0.60 x 4.50	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: brown grey slightly sandy gravelly silty clay with some timber fragments.		76.0					
0.5				75.5		0.50 0.50	B ES	PM49 PM50	
1.0				75.0	75.01				
1.10		MADE GROUND: brown slightly sandy gravelly silty clay with medium cobble and low boulder content.		74.5		1.50 1.50	B ES	PM51 PM52	
1.5				74.0					
1.80				73.5	74.31				
2.0		Stiff becoming very stiff black slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		73.0					
2.5				72.5		2.50 2.50	B ES	PM53 PM54	
3.0				72.0					
3.5				71.5		3.50 3.50	B ES	PM55 PM56	
4.0				71.0					
4.5	4.50	Pit terminated at 4.50m		71.5	71.61				

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP102</b>
Contract:	DUB15 Digital Realty	Easting:	703919.455	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730364.456	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	76.88	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.90 x 0.60 x 4.50	Status:	FINAL

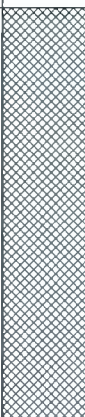
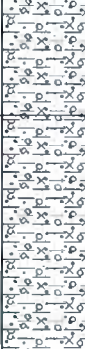


Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale	Depth			Scale	Depth	Depth	Type	Result	
	0.10	TOPSOIL.			76.78				
		MADE GROUND: brown grey slightly sandy gravelly silty clay with some lean mix concrete and electric cable fragments.			76.5				
0.5						0.50	B	PM17	
						0.50	ES	PM18	
	1.00	MADE GROUND: grey blue slightly sandy gravelly silty clay with medium cobble, low boulder content and some timber, paper bags and concrete fragments.			76.0				
1.0					75.88				
					75.5				
1.5						1.50	B	PM19	
						1.50	ES	PM20	
					75.0				
2.0									
					74.5				
2.5						2.50	B	PM21	
						2.50	ES	PM22	
					74.0				
3.0	3.00	Stiff black slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).			73.88				
					73.5				
3.5						3.50	B	PM23	
						3.50	ES	PM24	▼
					73.0				
4.0	4.10	Grey silty slightly sandy fine to coarse, subangular to subrounded GRAVEL of limestone with medium cobble content. Sand is fine to coarse. Cobbles are subangular to subrounded of limestone.			72.78				
					72.5				
4.5	4.50	Pit terminated at 4.50m			72.38				
					72.0				

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Scheduled depth.	Pit walls stable.	3.60 Slow	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental


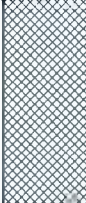


Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP103</b>	
Contract:	DUB15 Digital Realty	Easting:	703932.451	Date:	20/04/2021	
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730271.310	Excavator:	12T Tracked Excavator	
Client:	Digital Realty	Elevation:	75.97	Logged By:	P. McGonagle	
Engineer:	Arup	Dimensions (LxWxD) (m):	3.00 x 0.60 x 1.50	Status:	FINAL	

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
0.5		Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		75.5		0.50	B ES	PM09 PM10	
1.0	1.00	Grey silty slightly sandy fine to coarse, subangular to subrounded GRAVEL of limestone with medium cobble content. Sand is fine to coarse. Cobbles are subangular to subrounded of limestone.		75.0	74.97				
1.5	1.50	Pit terminated due to possible boulder obstruction. Pit terminated at 1.50m		74.5	74.47	1.50 1.50	B ES	PM11 PM12	
2.0				74.0					
2.5				73.5					
3.0				73.0					
3.5				72.5					
4.0				72.0					
4.5				71.5					


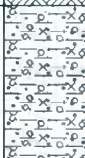

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental


Contract No: 5840		Trial Pit Log				Trial Pit No: TP104					
Contract:		DUB15 Digital Realty		Easting:	703938.827	Date:	20/04/2021				
Location:		Profile Park, Grange Castle, Co. Dublin		Northing:	730255.248	Excavator:	12T Tracked Excavator				
Client:		Digital Realty		Elevation:	76.38	Logged By:	P. McGonagle				
Engineer:		Arup		Dimensions (LxWxD) (m):	3.80 x 0.60 x 2.60	Status:	FINAL				
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale	Depth					Scale	Depth	Depth	Type	Result	
		MADE GROUND: brown grey slightly sandy gravelly silty clay with low cobble content and some red brick fragments.									
0.5							76.0				
								0.50	ES	PM44	
1.0							75.5				
1.40		Firm grey brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.					75.0	74.98			
1.5								1.50	B	PM45	
1.80		Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are angular to subrounded of limestone.					74.5	74.58		ES	PM46
2.0											
2.5							74.0				
2.60		Pit terminated due to possible boulder obstruction. Pit terminated at 2.60m					73.78	2.50	B	PM47	
								2.50	ES	PM48	
3.0							73.5				
3.5							73.0				
4.0							72.5				
4.5							72.0				
							71.5				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:					
		Obstruction - possible boulders.	Pit walls stable.	Dry	Foundation Pit 101 completed at same location.	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental					



Contract No: 5840		<b>Trial Pit Log</b>				Trial Pit No: <b>TP105</b>					
Contract:		DUB15 Digital Realty		Easting:	703914.403	Date:	20/04/2021				
Location:		Profile Park, Grange Castle, Co. Dublin		Northing:	730231.977	Excavator:	12T Tracked Excavator				
Client:		Digital Realty		Elevation:	77.21	Logged By:	P. McGonagle				
Engineer:		Arup		Dimensions (LxWxD) (m):	3.20 x 0.60 x 1.60	Status:	FINAL				
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike	
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.					77.0	77.01			
	0.5	MADE GROUND: brown grey slightly sandy gravelly silty clay with some plastic and steel fragments.							0.50	B	PM13
	0.90	Stiff grey slightly sandy very gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).					76.5	76.31	0.50	ES	PM14
	1.5	Pit terminated due to possible boulder obstruction. Pit terminated at 1.60m					76.0		1.50	B	PM15
	1.60						75.5	75.61	1.50	ES	PM16
	2.0						75.0				
	2.5						74.5				
	3.0						74.0				
	3.5						73.5				
	4.0						73.0				
	4.5						72.5				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:				
		Obstruction - possible boulders.	Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental				

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP106</b>
Contract:	DUB15 Digital Realty	Easting:	703882.502	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730215.796	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.08	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.30 x 0.60 x 1.90	Status:	FINAL


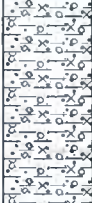

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.15	TOPSOIL.		78.0	77.93				
	0.5	Firm brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		77.5		0.50	B	PM01	
	0.70	Stiff grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).		77.38		0.50	ES	PM02	
	1.90	Pit terminated due to possible boulder obstruction. Pit terminated at 1.90m		77.0		1.50	B	PM03	
				76.5		1.50	ES	PM04	
				76.18					
				76.0					
				75.5					
				75.0					
				74.5					
				74.0					
				73.5					


	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key: B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	




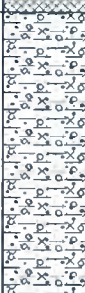

Contract No: 5840	Trial Pit Log	Trial Pit No: <b>TP107</b>
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Contract:	DUB15 Digital Realty	Easting:	703904.141	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730161.085	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	79.06	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.10 x 0.60 x 1.90	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		79.0					
	0.20	Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		78.86					
	0.5			78.5	0.50	B	PM05		
	0.90	Stiff grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		78.16					
	1.0			78.0					
	1.5			77.5	1.50	B	PM07		
	1.90	Pit terminated due to possible boulder obstruction. Pit terminated at 1.90m		77.16	1.50	ES	PM08		
	2.0			77.0					
	2.5			76.5					
	3.0			76.0					
	3.5			75.5					
	4.0			75.0					
	4.5			74.5					

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

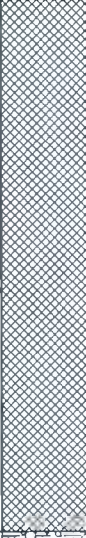

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP108</b>
Contract:	DUB15 Digital Realty	Easting:	703794.168	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730224.059	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.40	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.00 x 0.60 x 3.50	Status:	FINAL


Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: brown silty slightly sandy gravel with low cobble content.							
0.5				78.0		0.50	ES	PM25	
1.0				77.5					
1.5				77.0		1.50	ES	PM26	
1.60				76.80					
2.0		Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		76.5					
2.5				76.0		2.50	B	PM27	
2.60				75.80		2.50	ES	PM28	
3.0		Stiff black slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		75.5					
3.5				75.0					
3.50		Pit terminated due to possible boulder obstruction. Pit terminated at 3.50m		74.90		3.50	B	PM29	
						3.50	ES	PM30	
4.0				74.5					
4.5				74.0					
				73.5					

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental


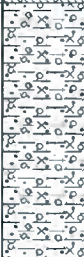

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP109</b>
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Contract:	DUB15 Digital Realty	Easting:	703764.154	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730231.255	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.93	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.40 x 0.60 x 2.90	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: brown grey slightly sandy gravelly silty clay with some steel and red brick fragments.							
0.5				78.5	0.50	ES	PM90		
1.0				78.0					
1.5				77.5	1.50	ES	PM91		
1.80				77.13					
2.0		Firm becoming stiff grey brown slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse. subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		77.0					
2.5				76.5	2.50	B	PM92		
				76.0	2.50	ES	PM93		
2.90		Pit terminated due to possible boulder obstruction. Pit terminated at 2.90m		76.03					
3.0				76.0					
3.5				75.5					
4.0				75.0					
4.5				74.5					
				74.0					

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP110</b>
Contract:	DUB15 Digital Realty	Easting:	703793.861	Date:	20/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730257.099	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	76.47	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.00 x 0.60 x 1.90	Status:	FINAL


Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.							
	0.30	Firm brown slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.			76.17				
	0.5			76.0	0.50	B	PM31		
					75.5	0.50	ES	PM32	
	1.20	Stiff grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 300mm diameter).			75.27				
	1.5			75.0	1.50	B	PM33		
					74.57	1.50	ES	PM34	
	1.90	Pit terminated due to possible boulder obstruction. Pit terminated at 1.90m			74.5				
	2.0				74.0				
	2.5				73.5				
	3.0				73.0				
	3.5				72.5				
	4.0				72.0				
	4.5								

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

<b>Contract No:</b> 5840	<h1 style="margin: 0;">Trial Pit Log</h1>	<b>Trial Pit No:</b> <b>TP111</b>
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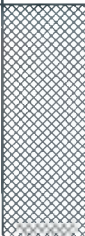
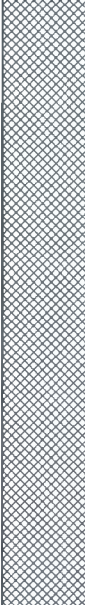

<b>Contract:</b>	DUB15 Digital Realty	<b>Easting:</b>	703819.528	<b>Date:</b>	22/04/2021
<b>Location:</b>	Profile Park, Grange Castle, Co. Dublin	<b>Northing:</b>	730308.373	<b>Excavator:</b>	12T Tracked Excavator
<b>Client:</b>	Digital Realty	<b>Elevation:</b>	76.19	<b>Logged By:</b>	P. McGonagle
<b>Engineer:</b>	Arup	<b>Dimensions (LxWxD) (m):</b>	2.90 x 0.60 x 2.30	<b>Status:</b>	FINAL


Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: grey brown silty sandy gravel with low cobble content.		76.0					
0.5						0.50 0.50	B ES	PM57 PM58	
	1.20	Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are angular to subrounded of limestone.		75.0	74.99				
1.5				74.5		1.50 1.50	B ES	PM59 PM60	
	2.30	Pit terminated due to possible boulder obstruction. <span style="font-size: small;">Pit terminated at 2.30m</span>		74.0	73.89				
2.5				73.5					
3.0				73.0					
3.5				72.5					
4.0				72.0					
4.5				71.5					

	<b>Termination:</b>	<b>Pit Wall Stability:</b>	<b>Groundwater Rate:</b>	<b>Remarks:</b>	<b>Key:</b>
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental



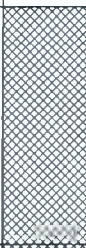
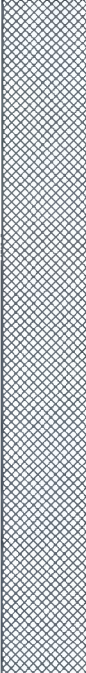

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP112</b>
Contract:	DUB15 Digital Realty	Easting:	703782.797	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730288.227	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	79.70	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.70 x 0.60 x 4.50	Status:	FINAL


Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: grey brown silty slightly sandy gravel with low cobble content.		79.5					
0.5						0.50	ES	PM66	
	0.80	MADE GROUND: brown grey slightly sandy gravelly silty clay with some steel and red brick fragments.		79.0	78.90				
1.0									
1.5						1.50	ES	PM67	
2.0									
2.5						2.50	ES	PM68	
3.0	2.90	Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		77.0	76.80				
3.5						3.50	B	PM69	
4.0						3.50	ES	PM70	
4.5	4.50	Pit terminated at 4.50m			75.20	4.50	B	PM71	
						4.50	ES	PM72	

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Scheduled depth.	Pit walls stable.	3.30 Slow	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental


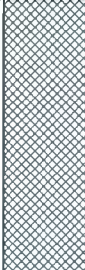

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP113</b>
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Contract:	DUB15 Digital Realty	Easting:	703771.018	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730301.742	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.42	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.80 x 0.60 x 4.30	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: grey silty slightly sandy gravel with low cobble content.		78.0		0.50	ES	PM94	
0.5									
	0.80	MADE GROUND: brown grey slightly sandy gravelly silty clay with medium cobble content and some concrete and red brick fragments.		77.5	77.62				
1.0									
				77.0		1.50	ES	PM95	
1.5									
				76.5					
2.0									
				76.0		2.50	ES	PM96	
2.5									
				75.5					
3.0					75.32				
	3.10	Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		75.0		3.50	B	PM97	
3.5						3.50	ES	PM98	
				74.5					
4.0						4.00	B	PM100	
						4.00	ES	PM99	
4.30		Pit terminated due to possible boulder obstruction. Pit terminated at 4.30m		74.0	74.12				
4.5									
				73.5					

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP114</b>	
Contract:	DUB15 Digital Realty	Easting:	703781.598	Date:	22/04/2021	
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730324.084	Excavator:	12T Tracked Excavator	
Client:	Digital Realty	Elevation:	76.54	Logged By:	P. McGonagle	
Engineer:	Arup	Dimensions (LxWxD) (m):	3.40 x 0.60 x 2.60	Status:	FINAL	

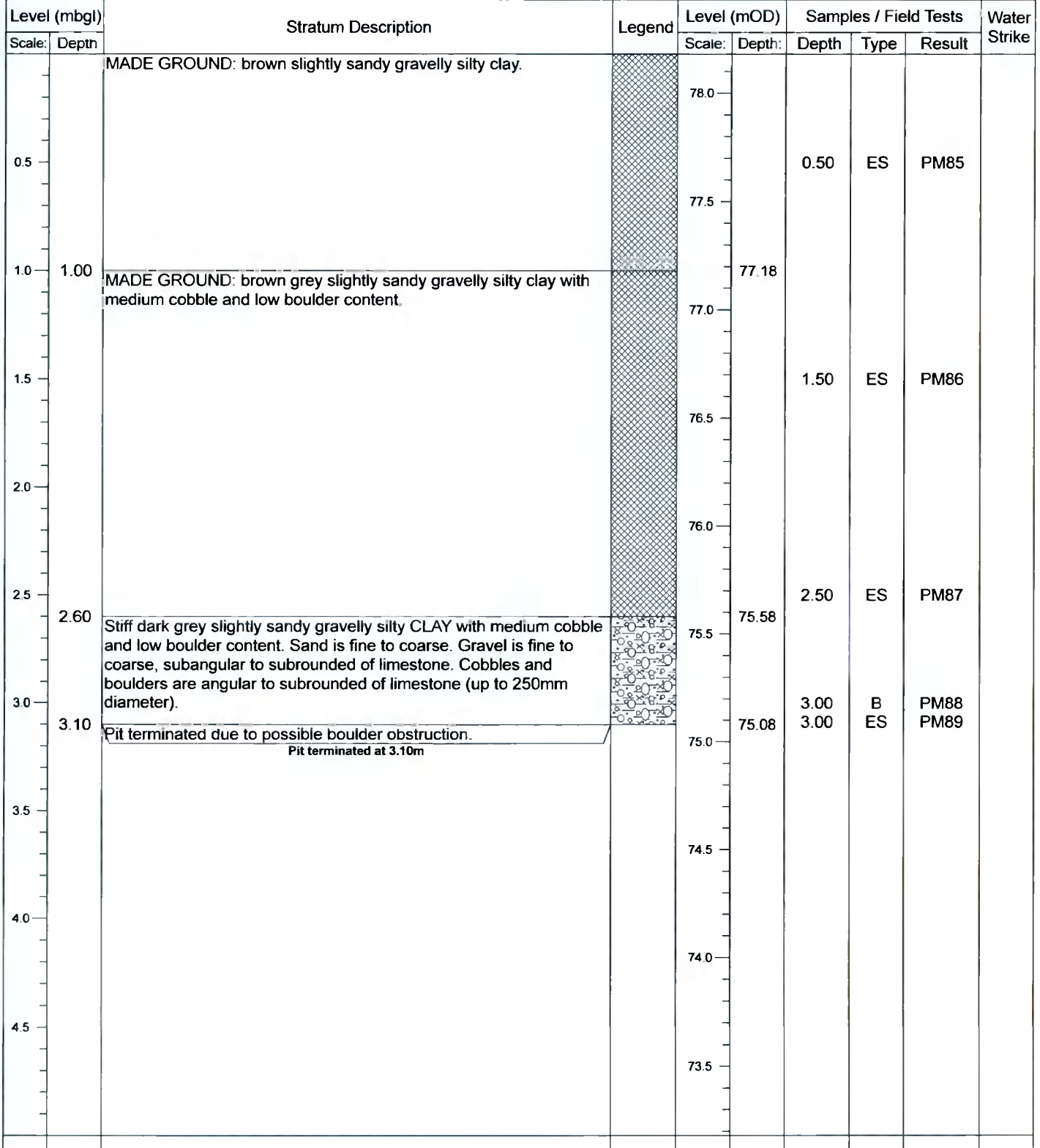
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.10	MADE GROUND: grey brown silty slightly sandy gravel with low cobble content.		76.5	76.44				
		MADE GROUND: brown grey slightly sandy gravelly silty clay with some red brick fragments.				0.50	ES	PM61	
	1.10	Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		75.5	75.44				
				75.0		1.50	B	PM62	
				75.0		1.50	ES	PM63	
	2.60	Pit terminated due to possible boulder obstruction. Pit terminated at 2.60m		74.0	73.94	2.50	B	PM64	
				74.0		2.50	ES	PM65	

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental



Contract No: 5840	Trial Pit Log	Trial Pit No: <b>TP115</b>
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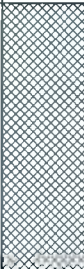
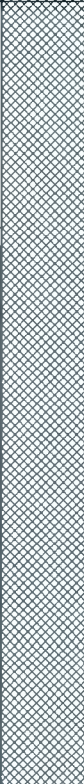

Contract:	DUB15 Digital Realty	Easting:	703754.605	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730326.636	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.18	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.50 x 0.60 x 3.10	Status:	FINAL




	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP116</b>
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Contract:	DUB15 Digital Realty	Easting:	703753.055	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730292.630	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	79.84	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	4.80 x 0.60 x 4.50	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		MADE GROUND: grey brown silty slightly sandy gravel with low cobble content.		79.5					
0.5						0.50	ES	PM73	
	0.90	MADE GROUND: grey brown slightly sandy gravelly silty clay with medium cobble and low boulder content.		79.0	78.94				
1.0									
1.5				78.5		1.50	ES	PM74	
2.0				78.0					
2.5				77.5					
3.0				77.0					
3.5				76.5		2.50	ES	PM75	
3.60				76.24					
4.0		Stiff dark grey slightly sandy gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		76.0		4.00	B	PM77	
						4.00	ES	PM78	
4.5	4.50	Pit terminated at 4.50m		75.5	75.34				
				75.0					

	Termination:	Pit Wall Stability:	Groundwater Rate	Remarks:	Key:
	Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5840	<b>Trial Pit Log</b>				Trial Pit No: <b>TP117</b>	
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Contract:	DUB15 Digital Realty	Easting:	703720.482	Date:	22/04/2021
Location:	Profile Park, Grange Castle, Co. Dublin	Northing:	730240.262	Excavator:	12T Tracked Excavator
Client:	Digital Realty	Elevation:	78.18	Logged By:	P. McGonagle
Engineer:	Arup	Dimensions (LxWxD) (m):	3.60 x 0.60 x 3.30	Status:	FINAL

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.		78.0	77.98				
	0.5	Firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		77.5		0.50 0.50	B ES	PM79 PM80	
	0.90	Stiff dark grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone (up to 250mm diameter).		77.28					
	1.0			77.0					
	1.5			76.5		1.50 1.50	B ES	PM81 PM82	
	2.0			76.0					
	2.5			75.5		2.50 2.50	B ES	PM83 PM84	
	3.0			75.0					
	3.30	Pit terminated due to possible boulder obstruction. Pit terminated at 3.30m		74.88					
	3.5			74.5					
	4.0			74.0					
	4.5			73.5					

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Obstruction - possible boulders	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

**TP101 Sidewall**



**TP101 Spoil**





**TP102 Sidewall**



**TP102 Spoil**



**TP103 Sidewall**



**TP103 Spoil**





**TP104 Sidewall**



**TP104 Spoil**



**TP105 Sidewall**



**TP105 Spoil**





**TP106 Sidewall**



**TP106 Spoil**



**TP107 Sidewall**



**TP107 Spoil**





**TP108 Sidewall**



**TP108 Spoil**



**TP109 Sidewall**



**TP109 Spoil**





**TP110 Sidewall**

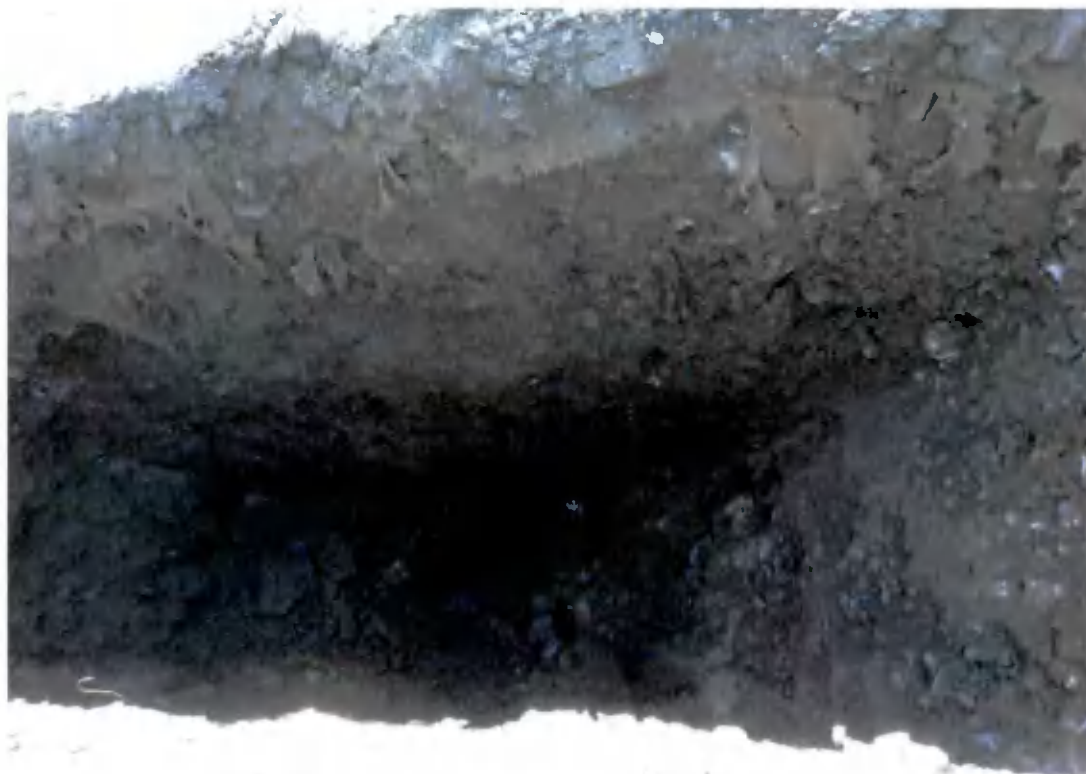


**TP110 Spoil**





**TP111 Sidewall**



**TP111 Spoil**



**TP112 Sidewall**



**TP112 Spoil**





**TP113 Sidewall**



**TP113 Spoil**



**TP114 Sidewall**



**TP114 Spoil**





**TP115 Sidewall**



**TP115 Spoil**





**TP116 Sidewall**



**TP116 Spoil**



**TP117 Sidewall**



**TP117 Spoil**



**Appendix 3**  
**Soakaway Test Results and Photographs**



# SOAKAWAY TEST



<b>Project Reference:</b>	5840
<b>Contract name:</b>	DUB15 Digital Realty
<b>Location:</b>	Profile Park, Grange Castle, Co. Dublin
<b>Test No:</b>	SA101
<b>Date:</b>	21/04/2021

### Ground Conditions

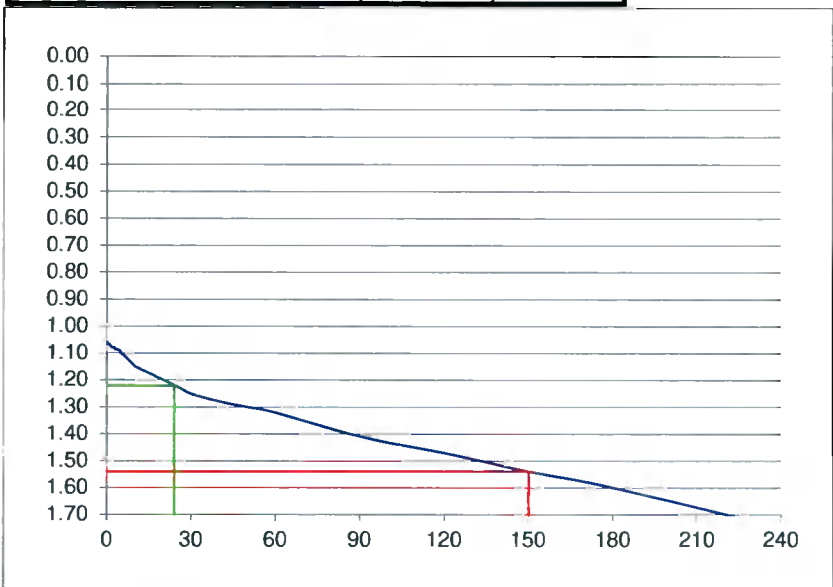
From	To	
0.00	0.15	TOPSOIL.
0.15	0.70	Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.
0.70	1.70	Stiff grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content.

### Remarks:

Pit terminated due to possible boulder or bedrock obstructions.

Elapsed Time (mins)	Fall of Water (m)
0	1.06
0.5	1.07
1	1.07
1.5	1.08
2	1.08
2.5	1.08
3	1.09
3.5	1.09
4	1.09
4.5	1.09
5	1.10
6	1.11
7	1.12
8	1.13
9	1.14
10	1.15
12	1.16
14	1.17
16	1.18
18	1.19
20	1.20
25	1.23
30	1.25
40	1.28
50	1.30
60	1.32
90	1.41
120	1.47
150	1.54
180	1.60
240	1.75

Pit Dimensions (m)	
Length (m)	1.90 m
Width (m)	0.60 m
Depth	1.70 m
Water	
Start Depth of Water	1.06 m
Depth of Water	0.64 m
75% Full	1.22 m
25% Full	1.54 m
75%-25%	0.32 m
Volume of water (75%-25%)	0.36 m <sup>3</sup>
Area of Drainage	8.5 m <sup>2</sup>
Area of Drainage (75%-25%)	2.74 m <sup>2</sup>
Time	
75% Full	24 min
25% Full	150 min
Time 75% to 25%	126 min
Time 75% to 25% (sec)	7560 sec



$f = \frac{0.00106}{\text{m/min}}$  or

$\frac{1.76E-05}{\text{m/s}}$

# SOAKAWAY TEST



<b>Project Reference:</b>	5840
<b>Contract name:</b>	DUB15 Digital Realty
<b>Location:</b>	Profile Park, Grange Castle, Co. Dublin
<b>Test No:</b>	SA102
<b>Date:</b>	21/04/2021

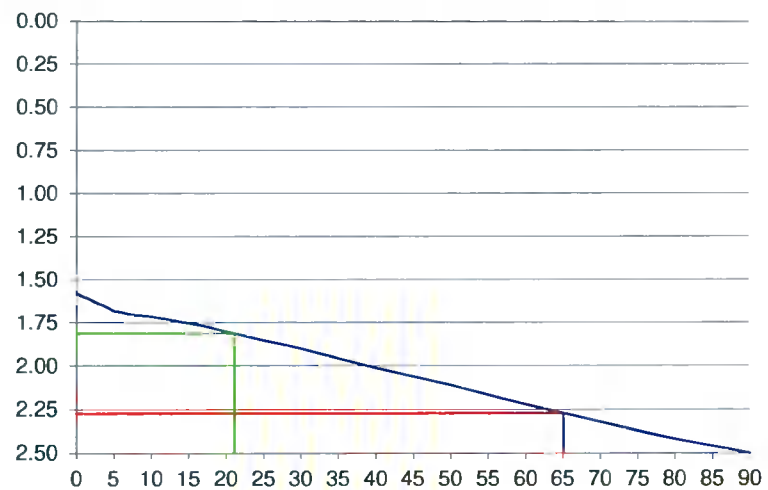
### Ground Conditions

From	To	
0.00	1.20	MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with medium cobble, low boulder content and some plastic fragments.
1.20	2.50	MADE GROUND: grey blue slightly sandy slightly gravelly silty clay with medium cobble, low boulder content and some plastic fragments.

### Remarks:

Elapsed Time (mins)	Fall of Water (m)
0	1.58
0.5	1.59
1	1.60
1.5	1.61
2	1.62
2.5	1.63
3	1.64
3.5	1.65
4	1.66
4.5	1.67
5	1.68
6	1.69
7	1.70
8	1.71
9	1.71
10	1.72
12	1.73
14	1.75
16	1.76
18	1.78
20	1.80
25	1.85
30	1.90
40	2.01
50	2.11
60	2.22
75	2.37
90	2.50

Pit Dimensions (m)	
Length (m)	2.60 m
Width (m)	0.60 m
Depth	2.50 m
Water	
Start Depth of Water	1.58 m
Depth of Water	0.92 m
75% Full	1.81 m
25% Full	2.27 m
75%-25%	0.46 m
Volume of water (75%-25%)	<b>0.72</b> m <sup>3</sup>
Area of Drainage	<b>16.00</b> m <sup>2</sup>
Area of Drainage (75%-25%)	<b>4.50</b> m <sup>2</sup>
Time	
75% Full	21 min
25% Full	65 min
Time 75% to 25%	<b>44</b> min
Time 75% to 25% (sec)	<b>2640</b> sec



$f = \frac{0.00362}{\text{m/min}}$  or

$\frac{6.04E-05}{\text{m/s}}$



**SA101 Sidewall**



**SA101 Spoil**



**SA102 Sidewall**



**SA102 Spoil**

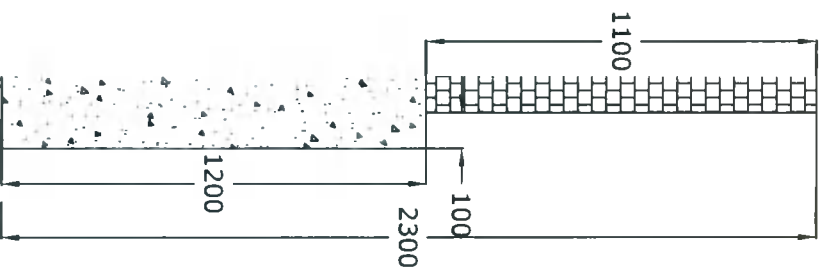


**Appendix 4**  
**Foundation Pit Logs**

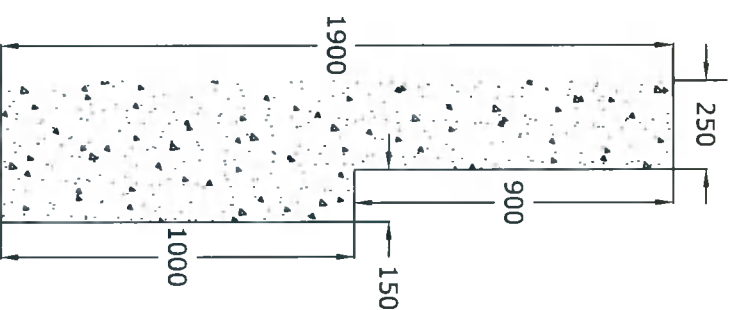


# Foundation Pits

FP101 (TP104)



FP102



**Foundation Details:**  
Concrete extends 0.25m at ground level and then 0.15m at 0.90mbgl with base of concrete at 1.90mbgl. No underlying foundation.

**Ground Conditions:**  
**0.00m:** MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with some red brick fragments.  
**0.90m:** Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.  
**1.10m:** Stiff grey slightly sandy gravelly silty CLAY with medium cobble content.  
**2.30m:** Pit terminated.  
 Samples: ES: 0.50m, 1.00m and 1.50m, B: 1.00m and 1.50m

**Foundation Details:**  
Red brick wall extends to 1.10mbgl and foundation extends 0.10m and 1.20m thick.

**Ground Conditions:**  
**0.00m:** MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with some red brick fragments.  
**1.40m:** Firm grey slightly sandy slightly gravelly silty CLAY with low cobble content.  
**1.80m:** Stiff dark grey slightly sandy slightly gravelly silty CLAY with medium cobble and low boulder content.  
**2.60m:** Pit terminated.

Project:	DUB15 Digital Realty		Logged by:	P. McGonagle		Excavation Started:	20/04/2021		Excavation Finished:	20/04/2021		CONTRACT NUMBER
Location:	Profile Park, Grange Castle, Co. Dublin		Scale:	NOT TO SCALE, ALL DISTANCES IN mm								
Consultant:	Arup		DEPTH ARE TO THE TOP OF SERVICES		5840							

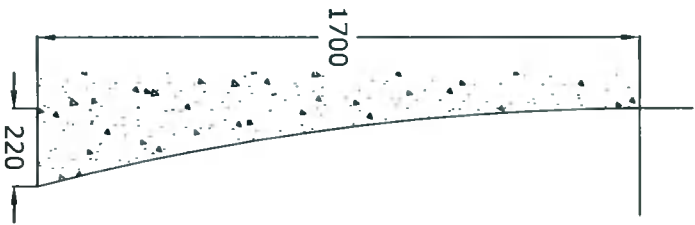


SITE INVESTIGATIONS LTD



# Foundation Pits

FP103



**Foundation Details:**

Wall extends to 1.70mbgl and tapers out 0.22m. No underlying foundation.

**Ground Conditions:**

- 0.00m:** MADE GROUND: brown grey slightly sandy slightly gravelly silty clay with some red brick fragments.
  - 0.90m:** Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.
  - 1.10m:** Stiff grey slightly sandy gravelly silty CLAY with medium cobble content.
  - 2.30m:** Pit terminated.
- Samples: ES: 0.50m and 1.50m, B: 1.50m



**SITE INVESTIGATIONS LTD**

Project:	DUB15 Digital Realty			Logged by:	P. McGonagle	Excavation Started:	20/04/2021	Excavation Finished:	20/04/2021	CONTRACT NUMBER	
Location:	Profile Park, Grange Castle, Co. Dublin			Scale:	NOT TO SCALE, ALL DISTANCES IN mm						
Consultant:	Arup			DEPTH ARE TO THE TOP OF SERVICES				5840			

**Appendix 5**  
**Plate Test Results**

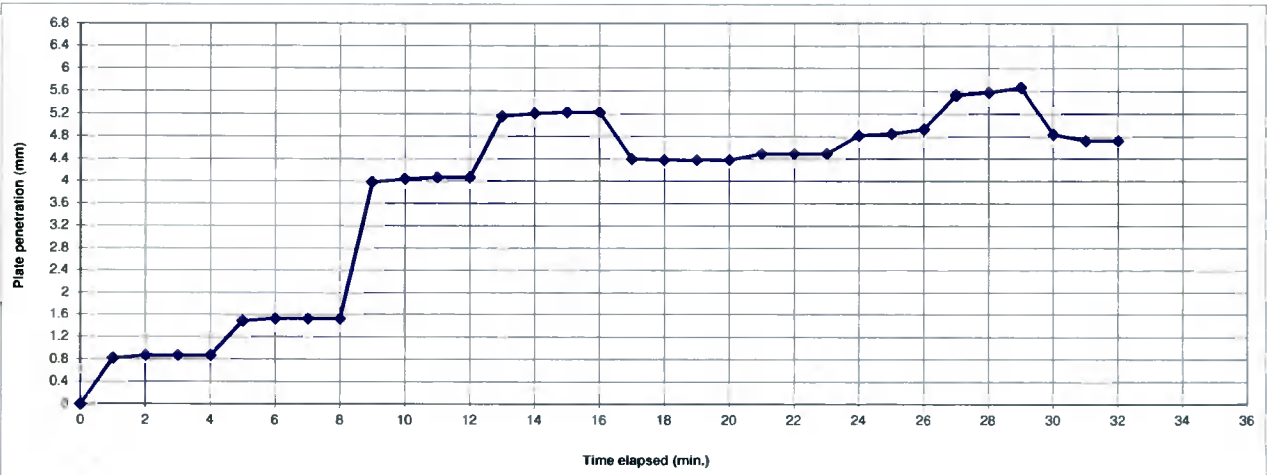
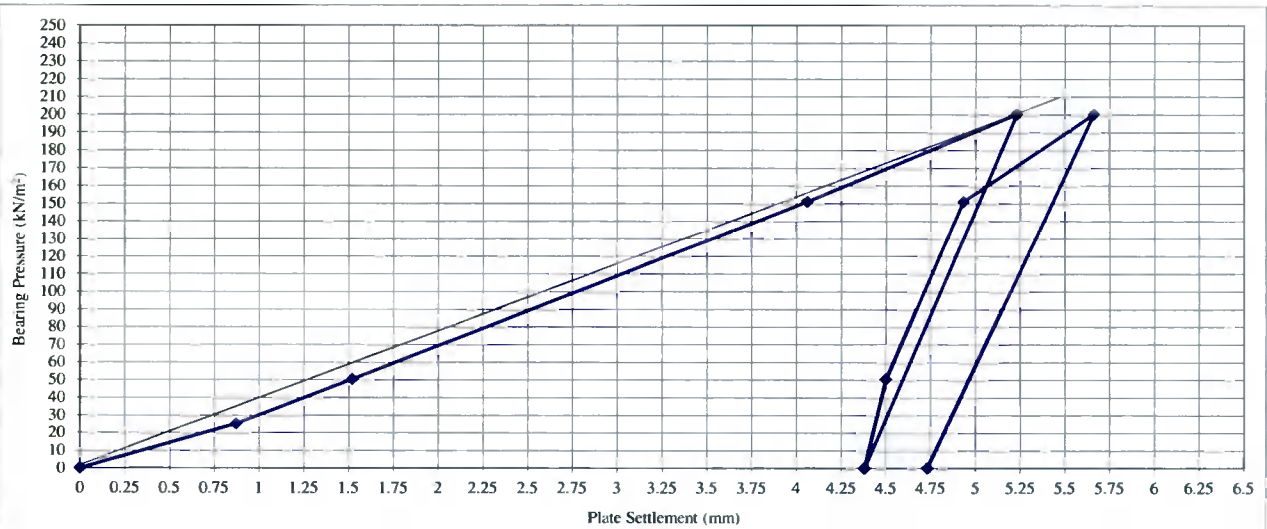
## Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Engineer	ARUP	
Site	Dub 15 Digital Realty	
Date	22-Apr-21	
Location:	TP102	
	Plate Diameter:	600mm
	Type of reaction Load	13 tonne excavator
Material Type:	Made Ground: Brown/Grey slightly sandy slightly gravelly silty CLAY with building rubble	
	Depth test carried out:	0.50m
	CBR value is as per specification for 762mm Plate	

Pressure Stages	Bearing Pressure (kN/m <sup>2</sup> )	Plate Settlement (mm)
Initial	0.0	0.00
	25	0.87
	50	1.52
	151	4.06
	200	5.23
	0.0	4.38
Reload	50	4.50
	151	4.93
	200	5.66
Final Condition	0.0	4.73

1.25mm settlement (graph) for 762mm Plate (kPa)	49
Equivalent CBR Value-Initial loading (%)	6.2
Mod. of subgrade Reaction k for 600mm Plate(kPa)	42
Correction factor for 600mm Plate	0.85



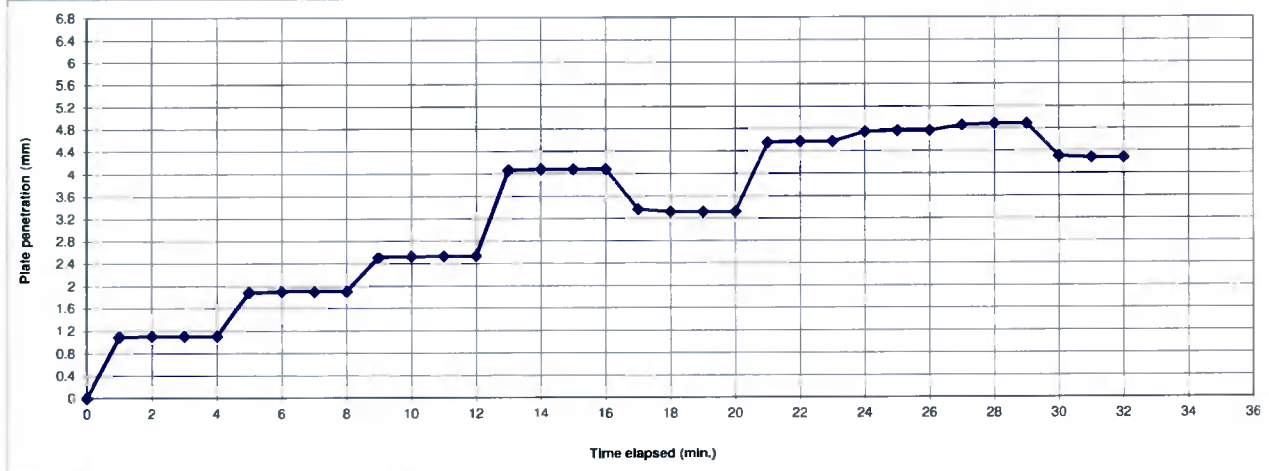
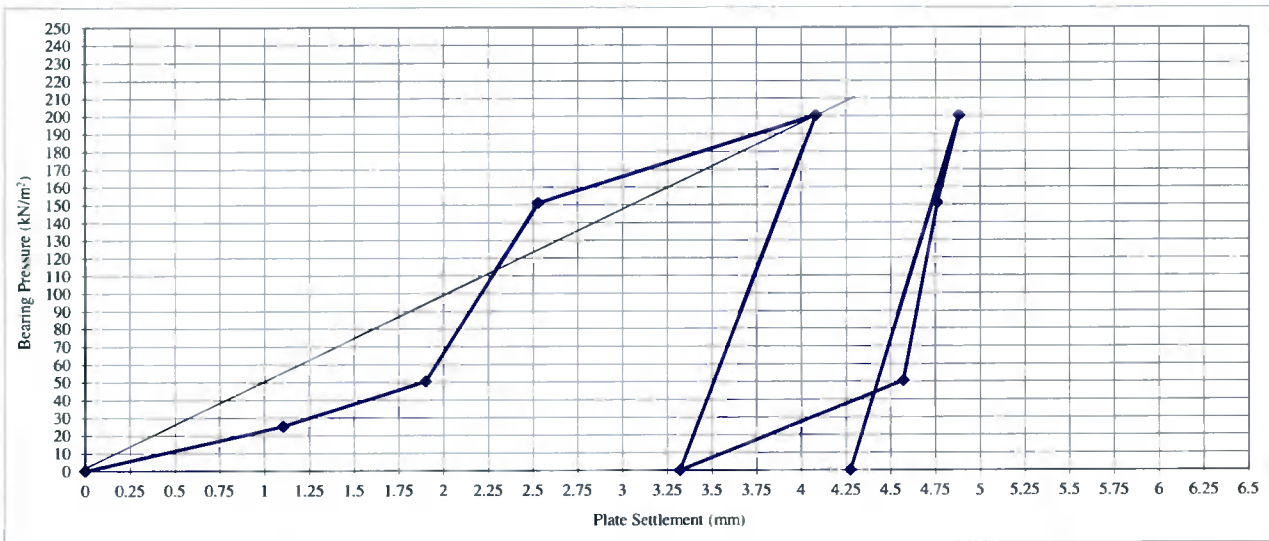
## Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Engineer	ARUP	
Site	Dub 15 Digital Realty	
Date	22-Apr-21	
Location:	TP107	
Plate Diameter:	600mm	
Type of reaction Load	13 tonne excavator	
Material Type:	Brown slightly sandy slightly gravelly silty CLAY	
Depth test carried out:	0.50m	
CBR value is as per specification for 762mm Plate		

Pressure Stages	Bearing Pressure (kN/m <sup>2</sup> )	Plate Settlement (mm)
Initial	0.0	0.00
	25	1.10
	50	1.90
	151	2.53
	200	4.08
	0.0	3.32
Reload	50	4.57
	151	4.76
	200	4.88
Final Condition	0.0	4.27

1.25mm settlement (graph) for 762mm Plate (kPa)	<b>62</b>
Equivalent CBR Value-Initial loading (%)	<b>9.3</b>
Mod. of subgrade Reaction k for 600mm Plate(kPa)	<b>53</b>
Correction factor for 600mm Plate	<b>0.85</b>





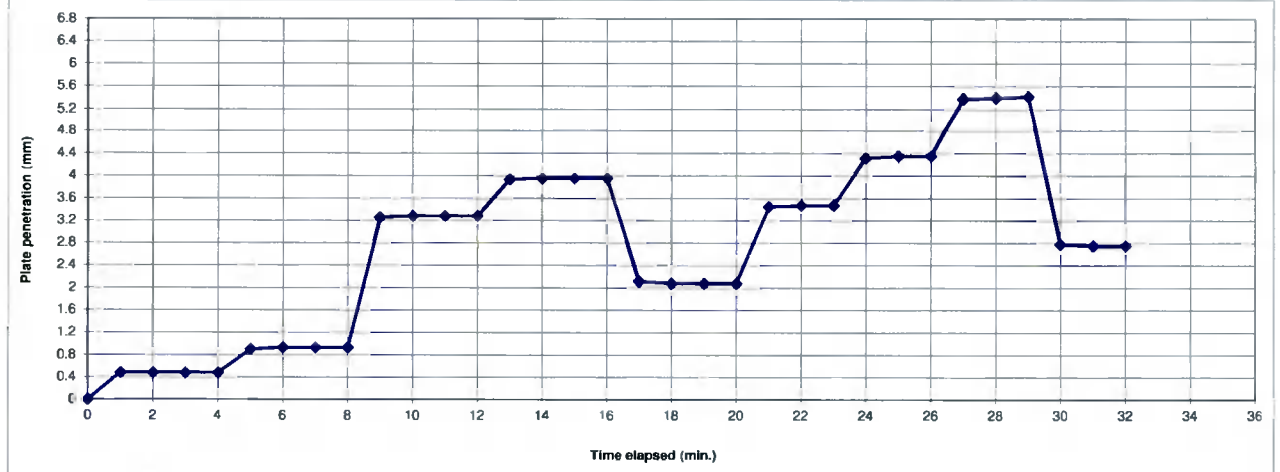
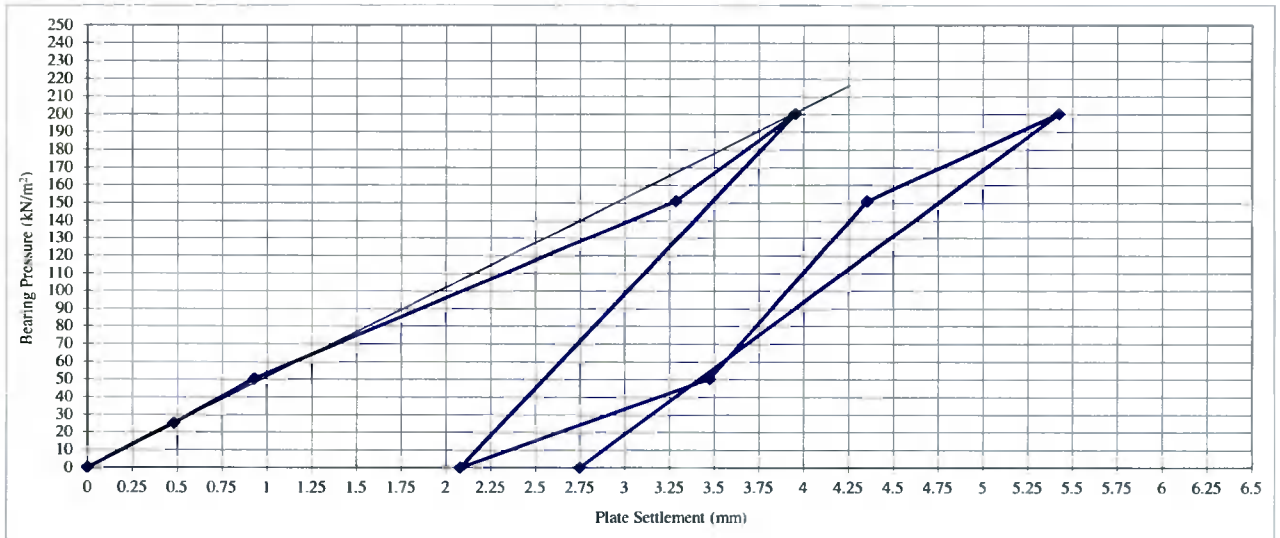
## Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Engineer	ARUP	
Site	Dub 15 Digital Realty	
Date	22-Apr-21	
Location:	TP110	
	Plate Diameter:	600mm
	Type of reaction Load	13 tonne excavator
Material Type:	Brown slightly sandy slightly gravelly silty CLAY	
	Depth test carried out:	0.50m
	CBR value is as per specification for 762mm Plate	

Pressure Stages	Bearing Pressure (kN/m <sup>2</sup> )	Plate Settlement (mm)
Initial	0.0	0.00
	25	0.48
	50	0.93
	151	3.28
	200	3.95
	0.0	2.08
Reload	50	3.47
	151	4.35
	200	5.42
Final Condition	0.0	2.75

1.25mm settlement (graph) for 762mm Plate (kPa)	<b>64</b>
Equivalent CBR Value- Initial loading (%)	<b>9.8</b>
Mod. of subgrade Reaction k for 600mm Plate(kPa)	<b>54</b>
Correction factor for 600mm Plate	<b>0.85</b>



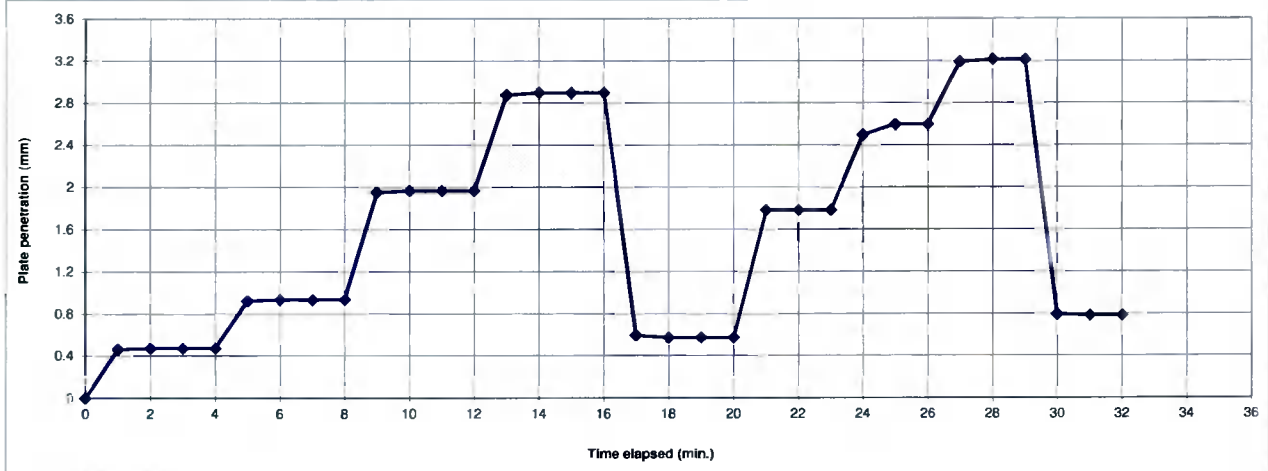
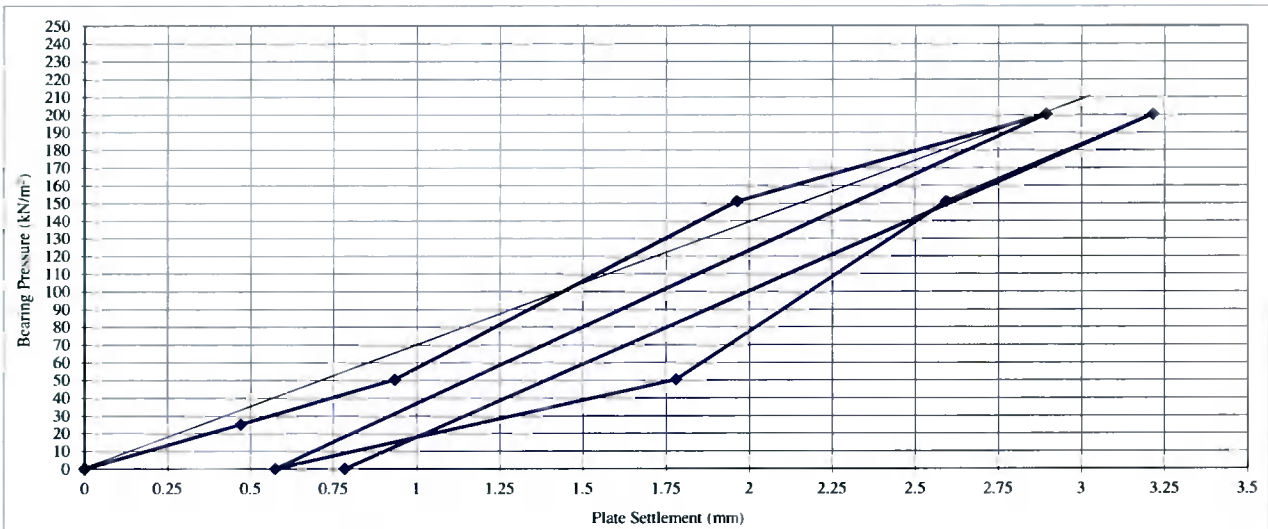
## Plate Bearing Test in accordance with BS 1377: Part 9 and Part 2 HD 25/94

Site Investigations Ltd., Carhugar The Grange, 12th Lock Road, Lucan, Co. Dublin Tel: 01 6108768 Email: info@siteinvestigations.ie

Engineer	ARUP	
Site	Dub 15 Digital Realty	
Date	22-Apr-21	
Location:	TP117	
	Plate Diameter:	600mm
	Type of reaction Load	13 tonne excavator
Material Type:	Brown slightly sandy slightly gravelly silty CLAY	
	Depth test carried out:	0.50m
	CBR value is as per specification for 762mm Plate	

Pressure Stages	Bearing Pressure (kN/m <sup>2</sup> )	Plate Settlement (mm)
Initial	0.0	0.00
	25	0.47
	50	0.93
	151	1.96
	200	2.89
	0.0	0.57
Reload	50	1.78
	151	2.59
	200	3.21
Final Condition	0.0	0.78

1.25mm settlement (graph) for 762mm Plate (kPa)	87
Equivalent CBR Value-Initial loading (%)	16.7
Mod. of subgrade Reaction k for 600mm Plate(kPa)	74
Correction factor for 600mm Plate	0.85



**Appendix 6**  
**Groundwater Monitoring**

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**Groundwater Readings**

Standpipe	Water Depth/mbgl	Water Depth/mOD
Reading 1 - 18/05/2021		
BH102	Dry	-
BH103	2.79	75.22
BH104	2.71	73.98
Reading 2 - 03/06/2021		
BH102	3.10	73.68
BH103	2.25	75.76
BH104	2.65	74.04
Reading 3 - 10/06/2021		
BH102	3.24	73.54
BH103	2.54	75.47
BH104	2.78	73.91



## Gas Readings

Date	03/06/2021			
Parameter	Unit	Standpipe		
		BH102	BH103	BH104
CH <sub>4</sub>	%	0.0	0.0	0.0
CO <sub>2</sub>	%	0.1	0.1	0.1
O <sub>2</sub>	%	20.3	20.8	20.4
CO	ppm	2	2	1
H <sub>2</sub> S	ppm	0	0	0
Balance	%	79.6	79.1	79.5
Peak CH <sub>4</sub>	%	0.1	0.1	0.2
Barometric Pressure	mB	1006	1006	1006
Flow	l/hr	0.1	0.1	0.4