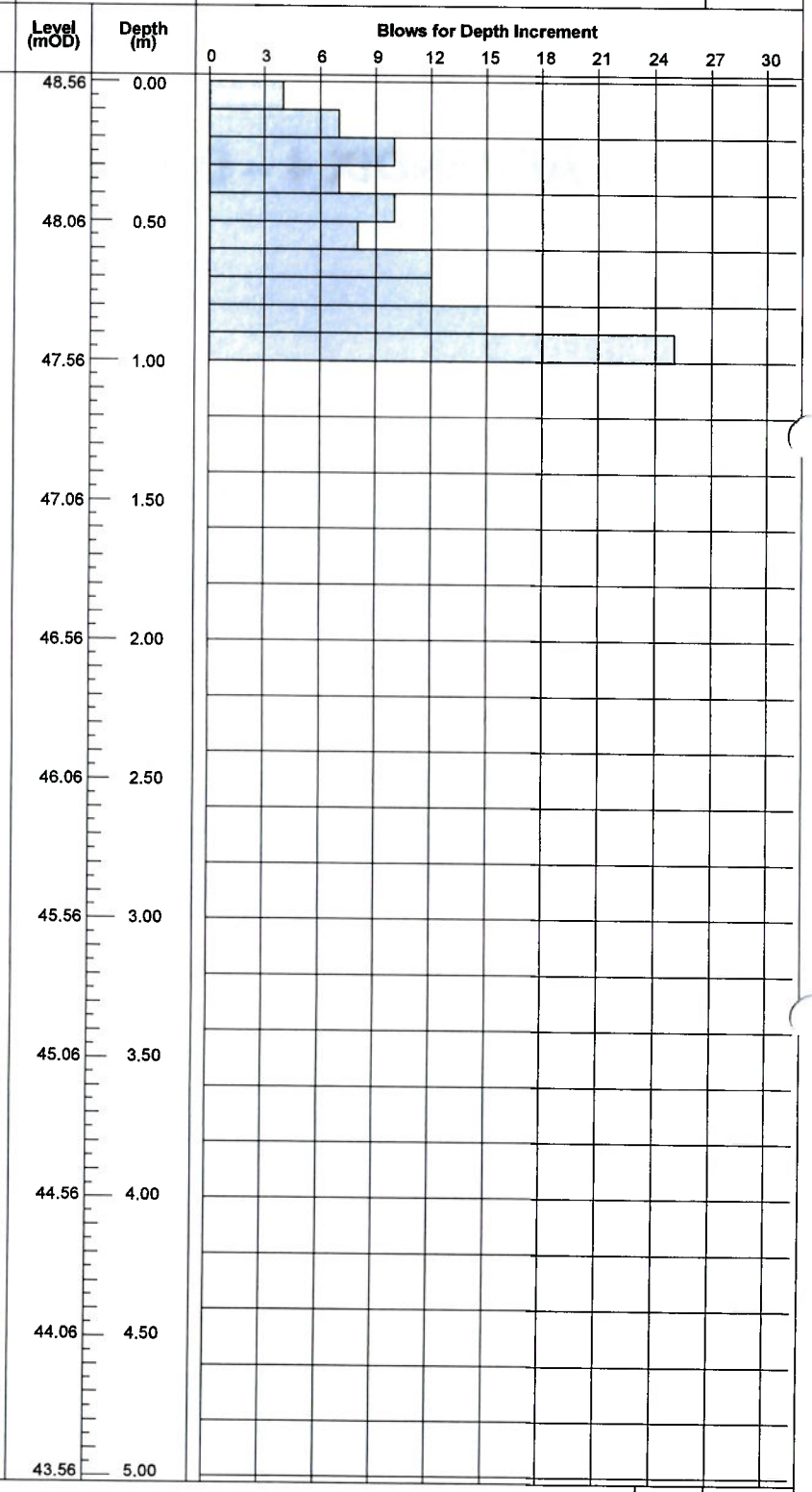
APPENDIX 4 – Dynamic Probe Records



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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 48.56	**Site** Coolpowra Galway	**Probe Number** DP-01
	Location 581942.1 E 709124.6 N	**Dates** 17/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	4	
0.10-0.20	7	
0.20-0.30	10	
0.30-0.40	7	
0.40-0.50	10	
0.50-0.60	8	
0.60-0.70	12	
0.70-0.80	12	
0.80-0.90	15	
0.90-1.00	25	



Remarks
Refusal at 1.00m BGL

Scale (approx)	Logged By
1:25	CMP

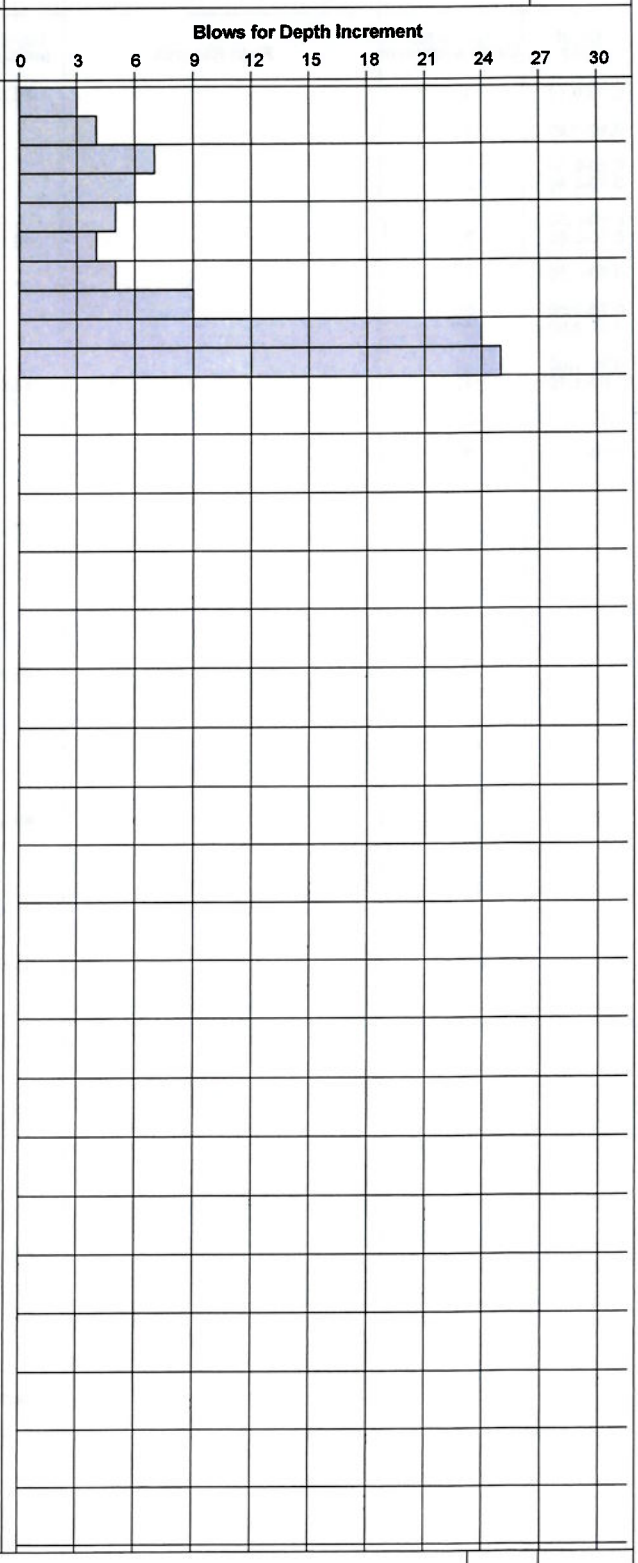
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 48.06	**Site** Coolpowra Galway	**Probe Number** DP-02
			Client Lumcloon Energy	**Job Number** 13999-07-24
	Location 582000.4 E 709111.5 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		48.06	0.00
0.10-0.20	4			
0.20-0.30	7			
0.30-0.40	6			
0.40-0.50	5			
0.50-0.60	4		47.56	0.50
0.60-0.70	5			
0.70-0.80	9			
0.80-0.90	24			
0.90-1.00	25		47.06	1.00
			46.56	1.50
			46.06	2.00
			45.56	2.50
			45.06	3.00
			44.56	3.50
			44.06	4.00
			43.56	4.50
			43.06	5.00



Remarks
Refusal at 1.00m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

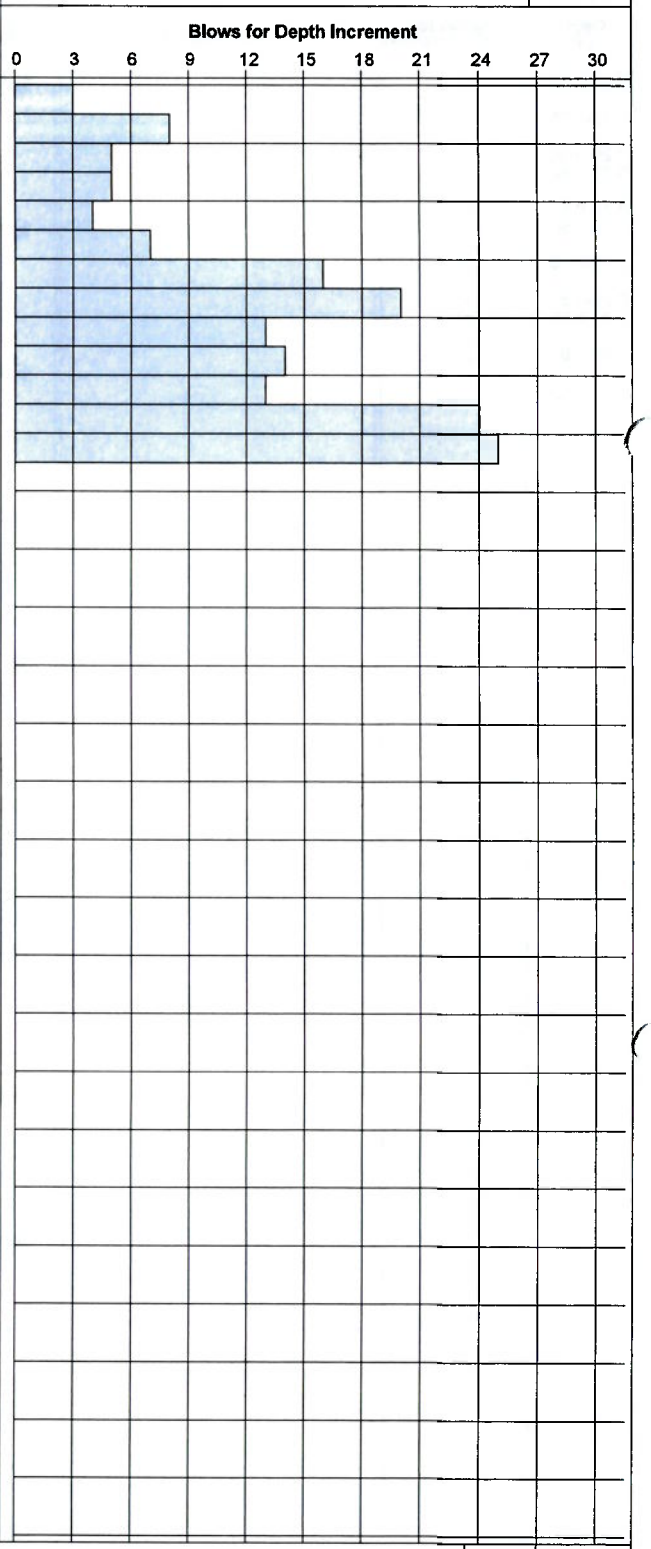
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Site	Probe Number
Coolpowra Galway	DP-03

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	48.64	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582014.8 E 709053.1 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		48.64	0.00
0.10-0.20	8			
0.20-0.30	5			
0.30-0.40	5			
0.40-0.50	4			
0.50-0.60	7		48.14	0.50
0.60-0.70	16			
0.70-0.80	20			
0.80-0.90	13			
0.90-1.00	14			
1.00-1.10	13		47.64	1.00
1.10-1.20	24			
1.20-1.30	25			
			47.14	1.50
			46.64	2.00
			46.14	2.50
			45.64	3.00
			45.14	3.50
			44.64	4.00
			44.14	4.50
			43.64	5.00



Remarks
Refusal at 1.30m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

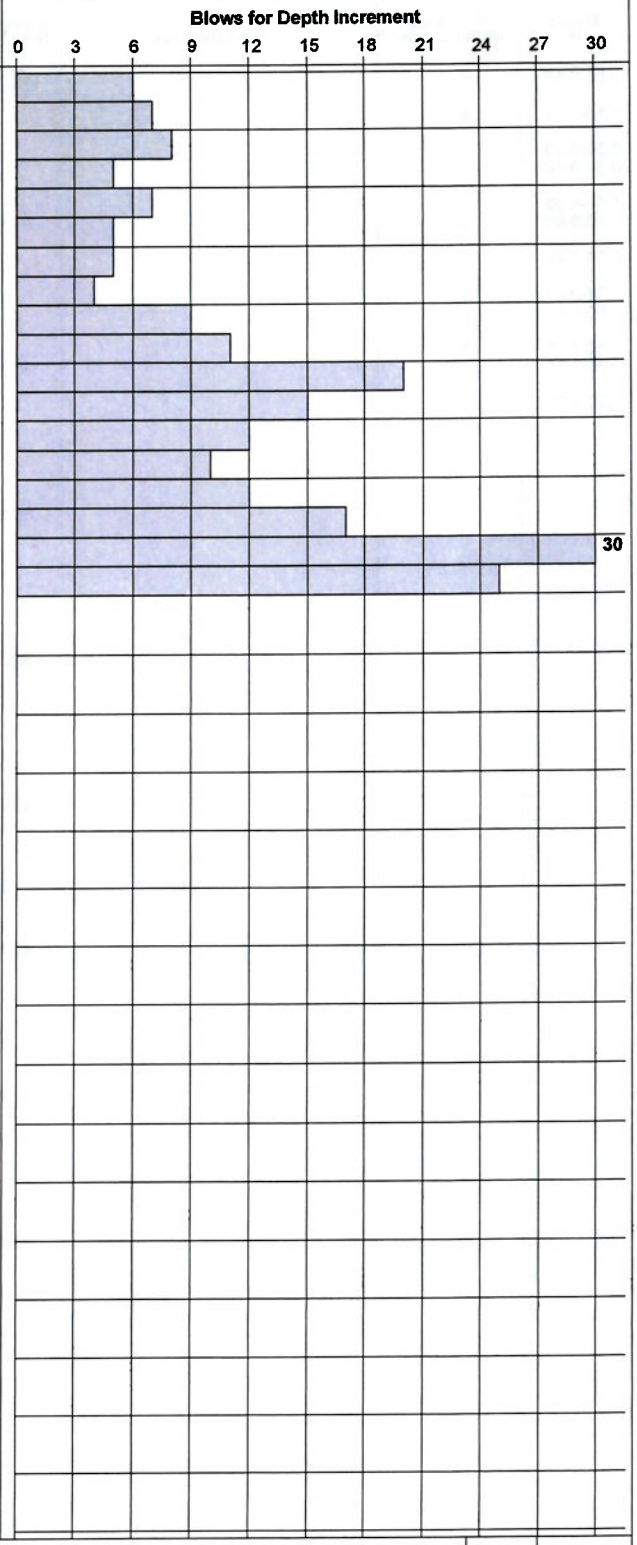
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Site	Probe Number
Coolpowra Galway	DP-04

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	49.13	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	581992.4 E 708973.1 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		49.13	0.00
0.10-0.20	7			
0.20-0.30	8			
0.30-0.40	5			
0.40-0.50	7			
0.50-0.60	5		48.63	0.50
0.60-0.70	5			
0.70-0.80	4			
0.80-0.90	9			
0.90-1.00	11			
1.00-1.10	20		48.13	1.00
1.10-1.20	15			
1.20-1.30	12			
1.30-1.40	10			
1.40-1.50	12			
1.50-1.60	17		47.63	1.50
1.60-1.70	30			
1.70-1.80	25			
			47.13	2.00
			46.63	2.50
			46.13	3.00
			45.63	3.50
			45.13	4.00
			44.63	4.50
			44.13	5.00



Remarks
Refusal at 1.80m BGL

Scale (approx)	Logged By
1:25	CMP

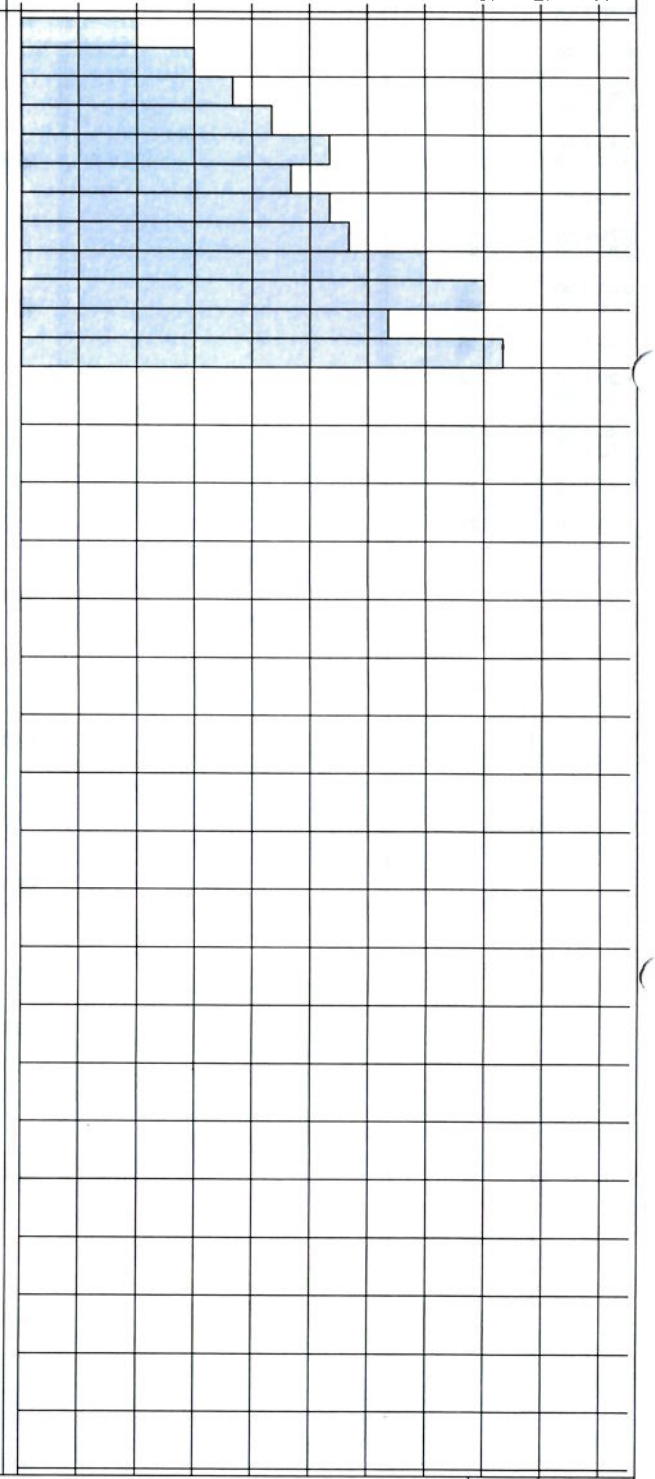
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-05
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 52.33	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582036.1 E 708972.1 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		52.33	0.00
0.10-0.20	9			
0.20-0.30	11			
0.30-0.40	13			
0.40-0.50	16			
0.50-0.60	14		51.83	0.50
0.60-0.70	16			
0.70-0.80	17			
0.80-0.90	21			
0.90-1.00	24			
1.00-1.10	19		51.33	1.00
1.10-1.20	25			
			50.83	1.50
			50.33	2.00
			49.83	2.50
			49.33	3.00
			48.83	3.50
			48.33	4.00
			47.83	4.50
			47.33	5.00



Remarks
Refusal at 1.20m BGL

Scale (approx)	Logged By
1:25	CMP

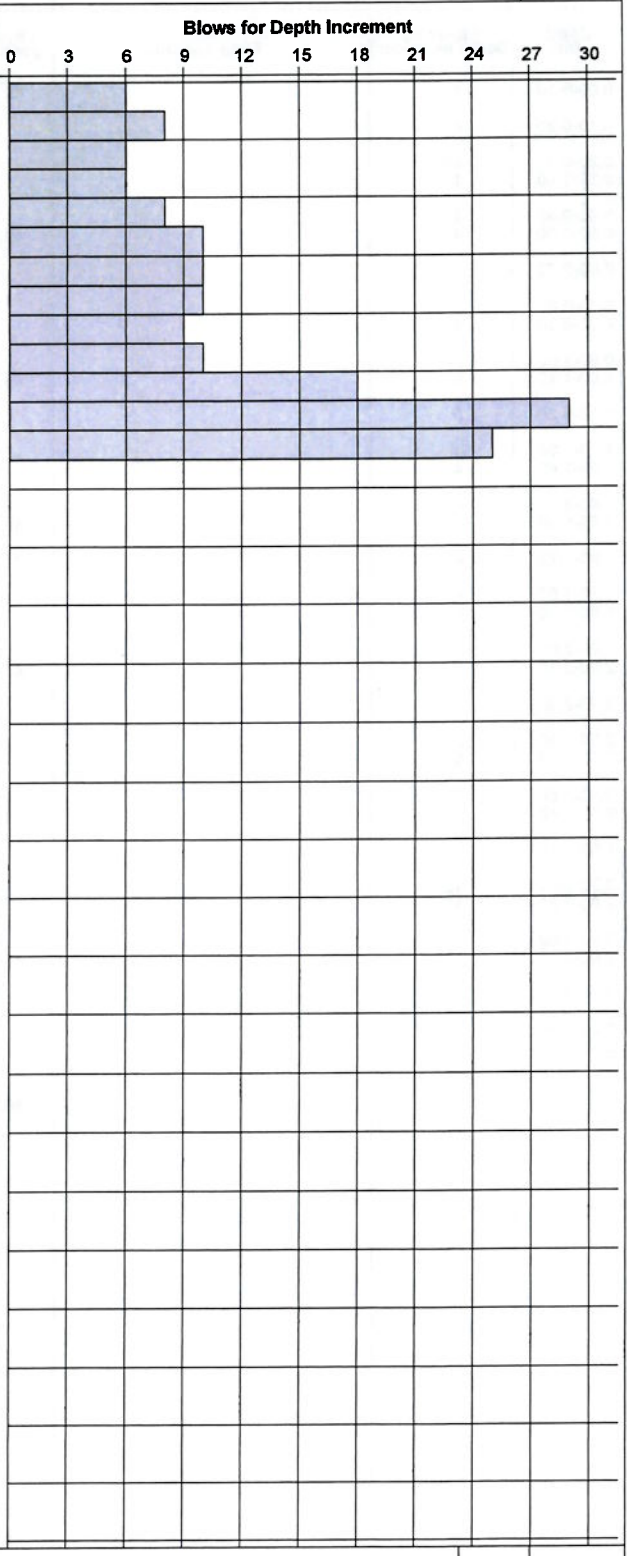
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-06
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 49.75	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582048.2 E 709036.1 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		49.75	0.00
0.10-0.20	8			
0.20-0.30	6			
0.30-0.40	6			
0.40-0.50	8			
0.50-0.60	10		49.25	0.50
0.60-0.70	10			
0.70-0.80	10			
0.80-0.90	9			
0.90-1.00	10			
1.00-1.10	18		48.75	1.00
1.10-1.20	29			
1.20-1.30	25			
			48.25	1.50
			47.75	2.00
			47.25	2.50
			46.75	3.00
			46.25	3.50
			45.75	4.00
			45.25	4.50
			44.75	5.00



Remarks
Refusal at 1.30m BGL

Scale (approx)	Logged By
1:25	CMP

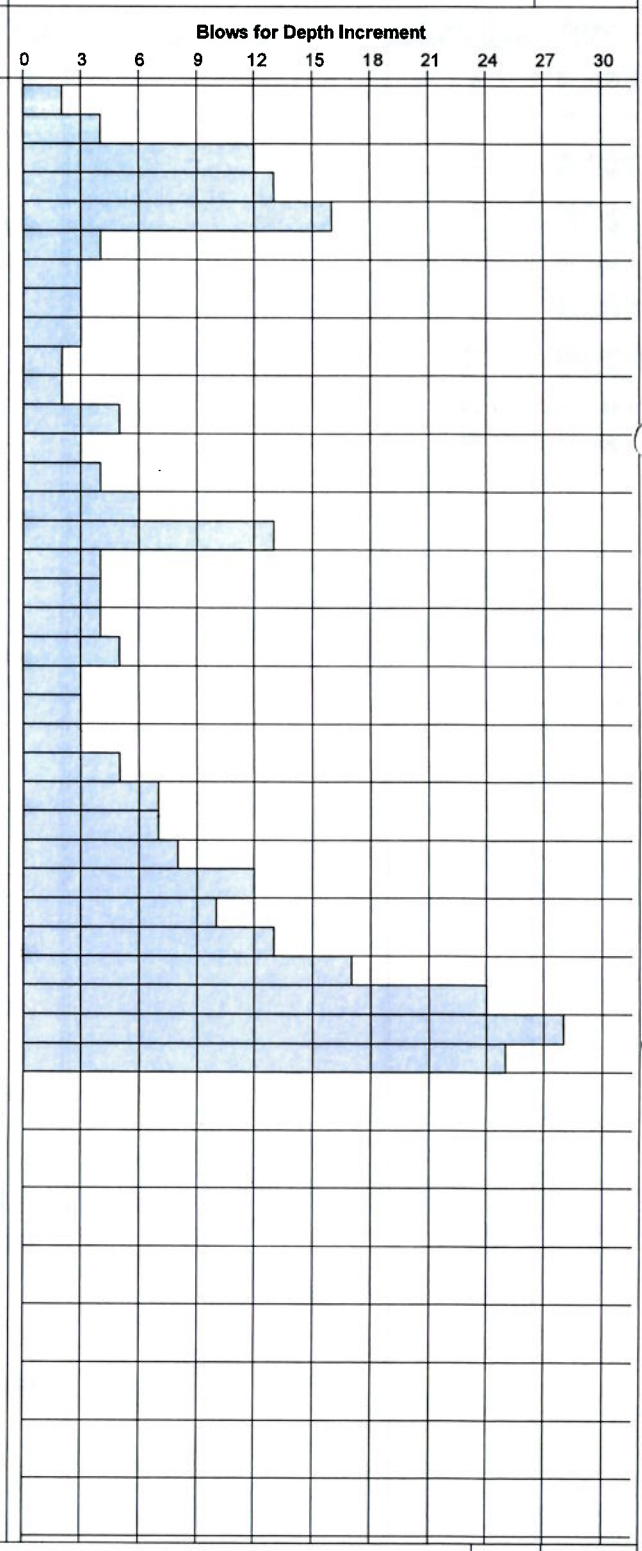
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-07
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 49.82	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582059.1 E 709168.4 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		49.82	0.00
0.10-0.20	4			
0.20-0.30	12			
0.30-0.40	13			
0.40-0.50	16			
0.50-0.60	4		49.32	0.50
0.60-0.70	3			
0.70-0.80	3			
0.80-0.90	3			
0.90-1.00	2			
1.00-1.10	2		48.82	1.00
1.10-1.20	5			
1.20-1.30	3			
1.30-1.40	4			
1.40-1.50	6			
1.50-1.60	13		48.32	1.50
1.60-1.70	4			
1.70-1.80	4			
1.80-1.90	4			
1.90-2.00	5			
2.00-2.10	3		47.82	2.00
2.10-2.20	3			
2.20-2.30	3			
2.30-2.40	5			
2.40-2.50	7			
2.50-2.60	7		47.32	2.50
2.60-2.70	8			
2.70-2.80	12			
2.80-2.90	10			
2.90-3.00	13			
3.00-3.10	17		46.82	3.00
3.10-3.20	24			
3.20-3.30	28			
3.30-3.40	25			
			46.32	3.50
			45.82	4.00
			45.32	4.50
			44.82	5.00



Remarks
Refusal at 3.40m BGL

Scale (approx)	Logged By
1:25	CMP

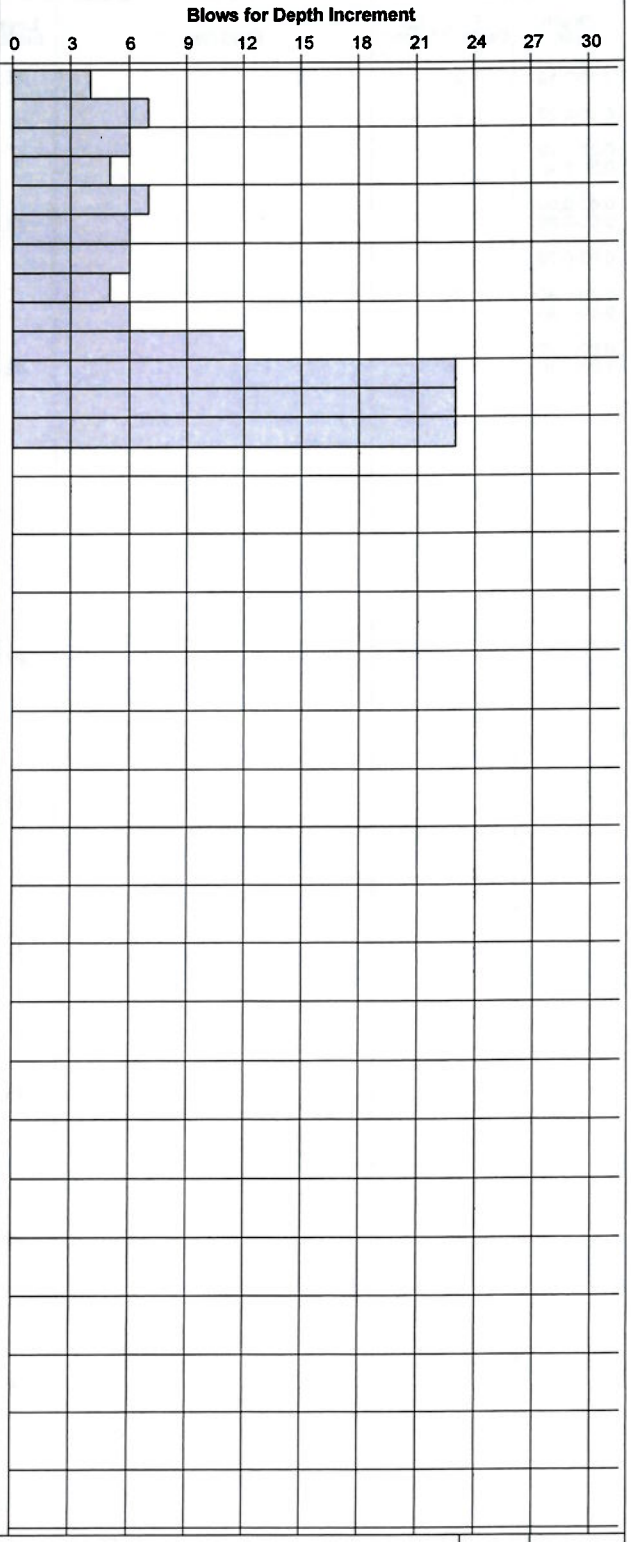
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 49.77	**Site** Coolpowra Galway	**Probe Number** DP-08
	Location 582079 E 709129.6 N	**Dates** 16/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		49.77	0.00
0.10-0.20	7			
0.20-0.30	6			
0.30-0.40	5			
0.40-0.50	7			
0.50-0.60	6		49.27	0.50
0.60-0.70	6			
0.70-0.80	5			
0.80-0.90	6			
0.90-1.00	12			
1.00-1.10	23		48.77	1.00
1.10-1.20	23			
1.20-1.30	23			
			48.27	1.50
			47.77	2.00
			47.27	2.50
			46.77	3.00
			46.27	3.50
			45.77	4.00
			45.27	4.50
			44.77	5.00



Remarks
Refusal at 1.30m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

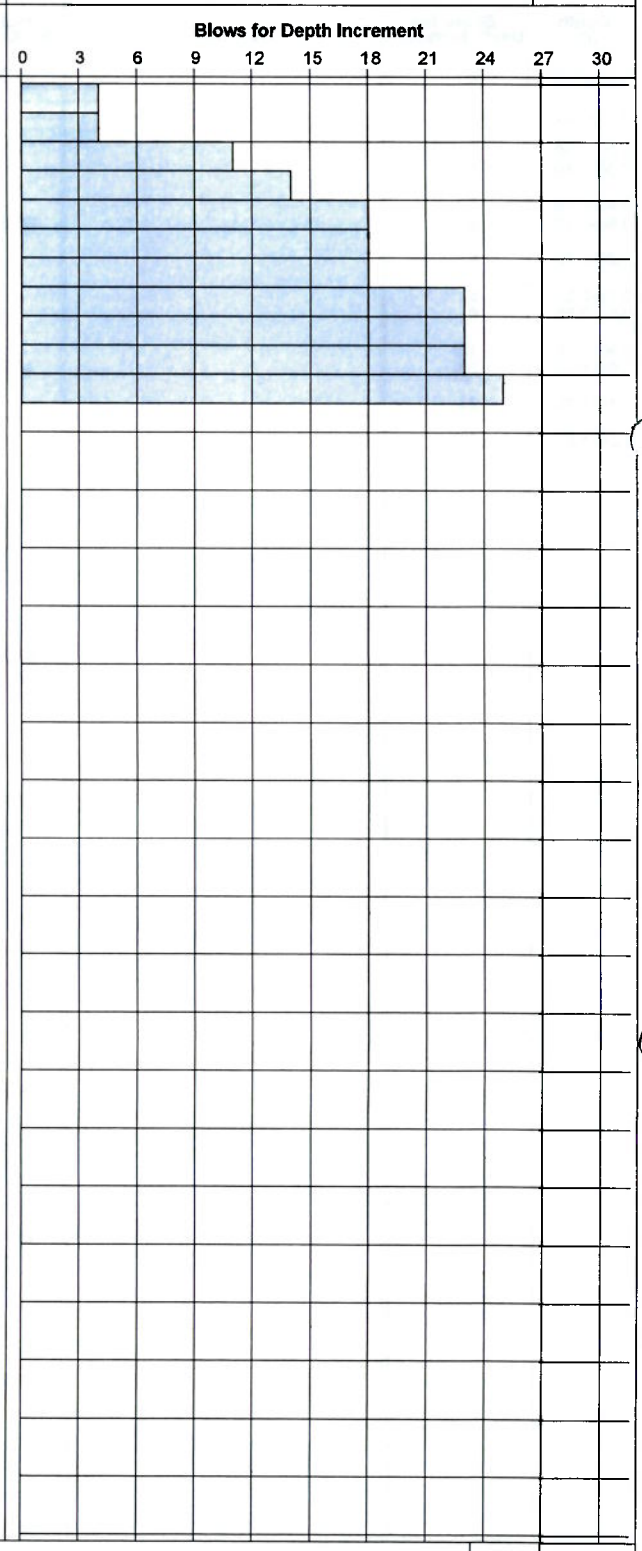
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Site	Probe Number
Coolpowra Galway	DP-09

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	49.48	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582073.9 E 709083.4 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		49.48	0.00
0.10-0.20	4			
0.20-0.30	11			
0.30-0.40	14			
0.40-0.50	18			
0.50-0.60	18		48.98	0.50
0.60-0.70	18			
0.70-0.80	23			
0.80-0.90	23			
0.90-1.00	23			
1.00-1.10	25		48.48	1.00
			47.98	1.50
			47.48	2.00
			46.98	2.50
			46.48	3.00
			45.98	3.50
			45.48	4.00
			44.98	4.50
			44.48	5.00



Remarks
Refusal at 1.10m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

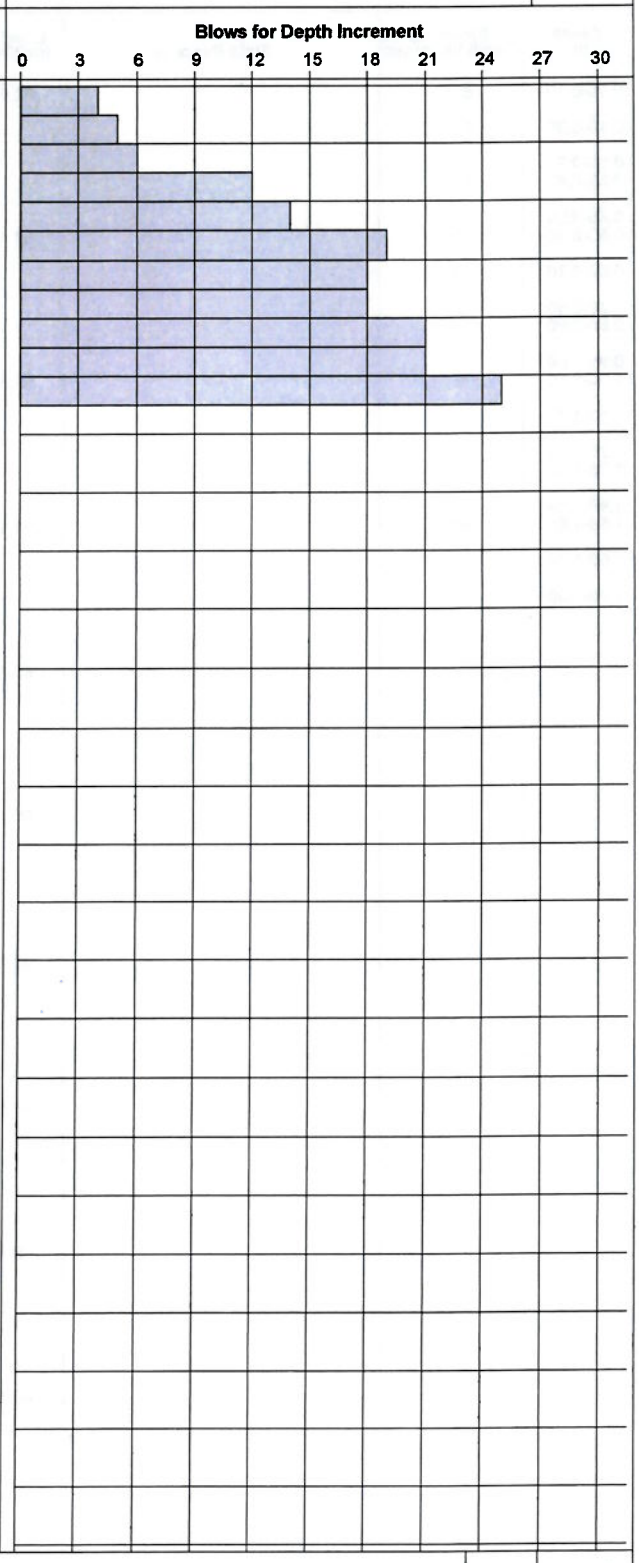
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Site	Probe Number
Coolpowra Galway	DP-10

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	49.53	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582094.4 E 709045 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		49.53	0.00
0.10-0.20	5			
0.20-0.30	6			
0.30-0.40	12			
0.40-0.50	14			
0.50-0.60	19		49.03	0.50
0.60-0.70	18			
0.70-0.80	18			
0.80-0.90	21			
0.90-1.00	21			
1.00-1.10	25		48.53	1.00
			48.03	1.50
			47.53	2.00
			47.03	2.50
			46.53	3.00
			46.03	3.50
			45.53	4.00
			45.03	4.50
			44.53	5.00



Remarks
Refusal at 1.10m BGL.

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

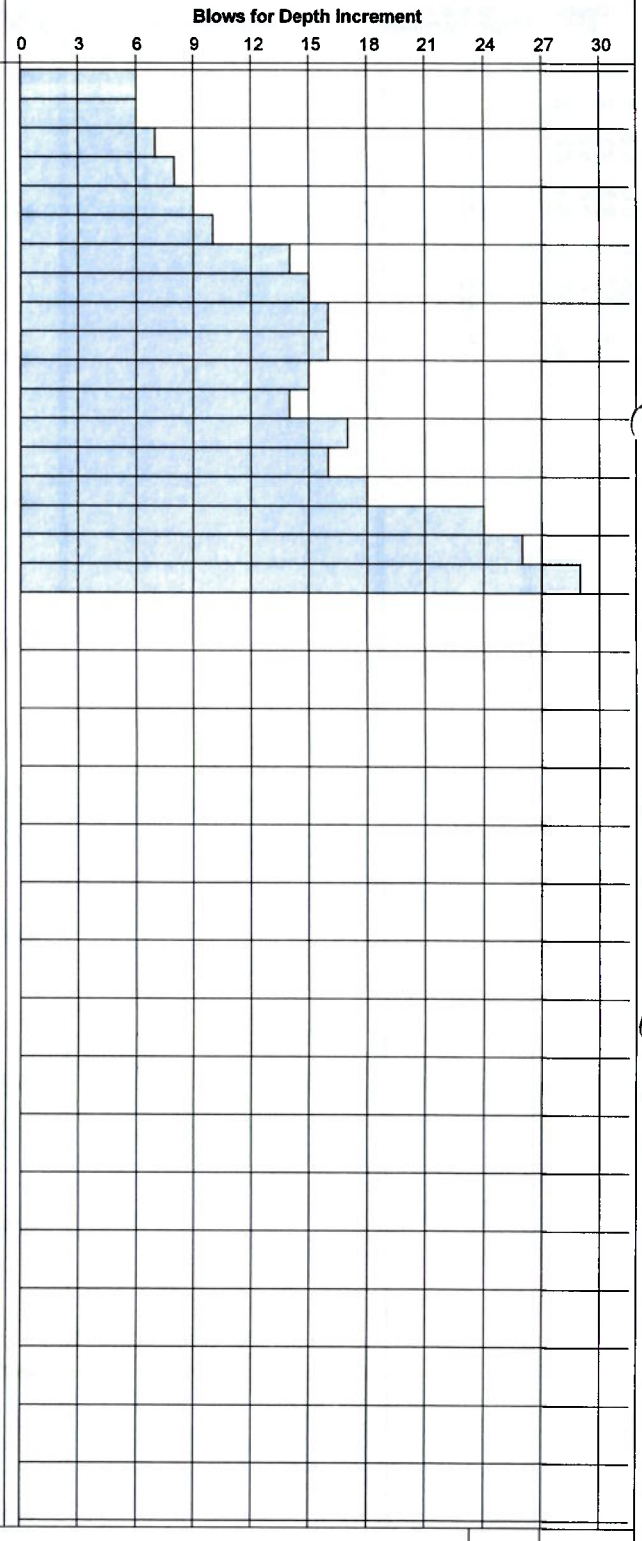
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Site	Probe Number
Coolpowra Galway	DP-11

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.66	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582079.5 E 708974.3 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		52.66	0.00
0.10-0.20	6			
0.20-0.30	7			
0.30-0.40	8			
0.40-0.50	9			
0.50-0.60	10		52.16	0.50
0.60-0.70	14			
0.70-0.80	15			
0.80-0.90	16			
0.90-1.00	16			
1.00-1.10	15		51.66	1.00
1.10-1.20	14			
1.20-1.30	17			
1.30-1.40	16			
1.40-1.50	18			
1.50-1.60	24		51.16	1.50
1.60-1.70	26			
1.70-1.80	29			
			50.66	2.00
			50.16	2.50
			49.66	3.00
			49.16	3.50
			48.66	4.00
			48.16	4.50
			47.66	5.00



Remarks
Refusal at 1.80m BGL

Scale (approx)	Logged By
1:25	CMP

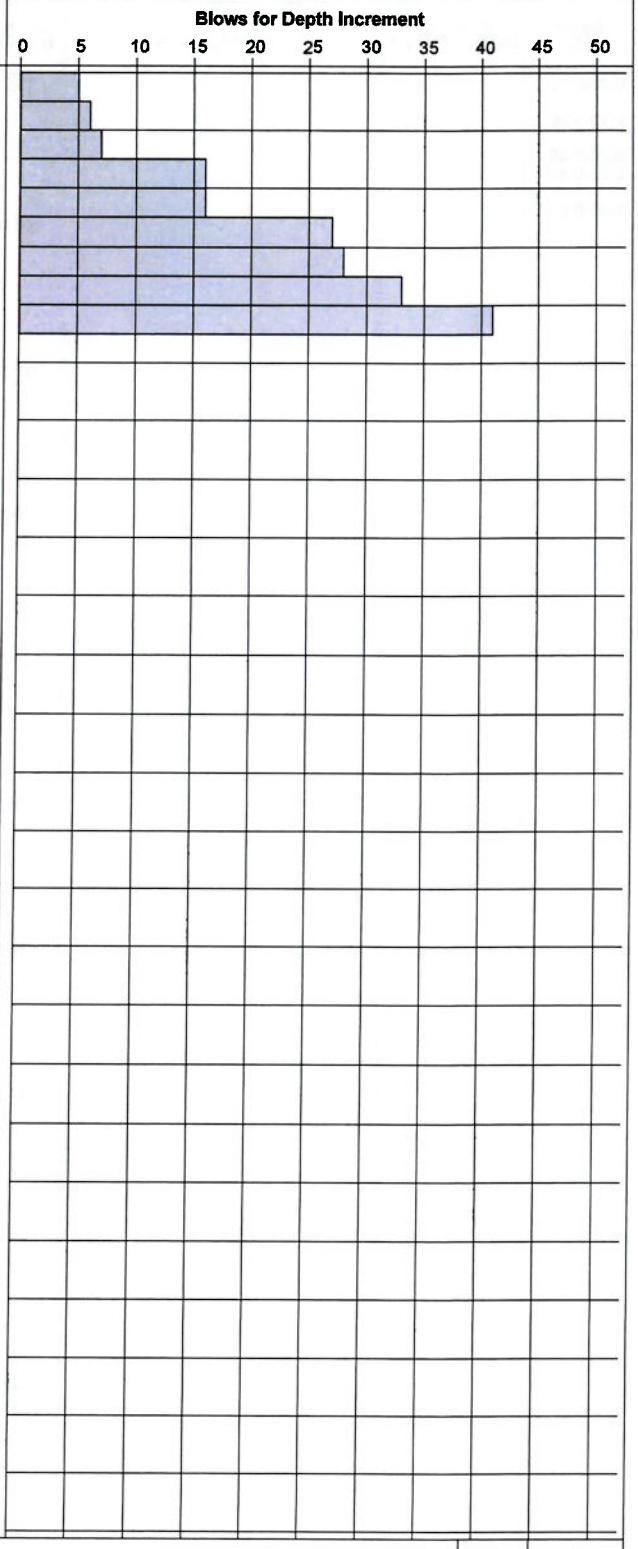
Figure No.
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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 50.76	**Site** Coolpowra Galway	**Probe Number** DP-12
	Location 582105.8 E 708933.4 N	**Dates** 17/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	5		50.76	0.00
0.10-0.20	6			
0.20-0.30	7			
0.30-0.40	16			
0.40-0.50	16			
0.50-0.60	27		50.26	0.50
0.60-0.70	28			
0.70-0.80	33			
0.80-0.90	41		49.76	1.00
			49.26	1.50
			48.76	2.00
			48.26	2.50
			47.76	3.00
			47.26	3.50
			46.76	4.00
			46.26	4.50
			45.76	5.00



Remarks
Refusal at 0.90m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

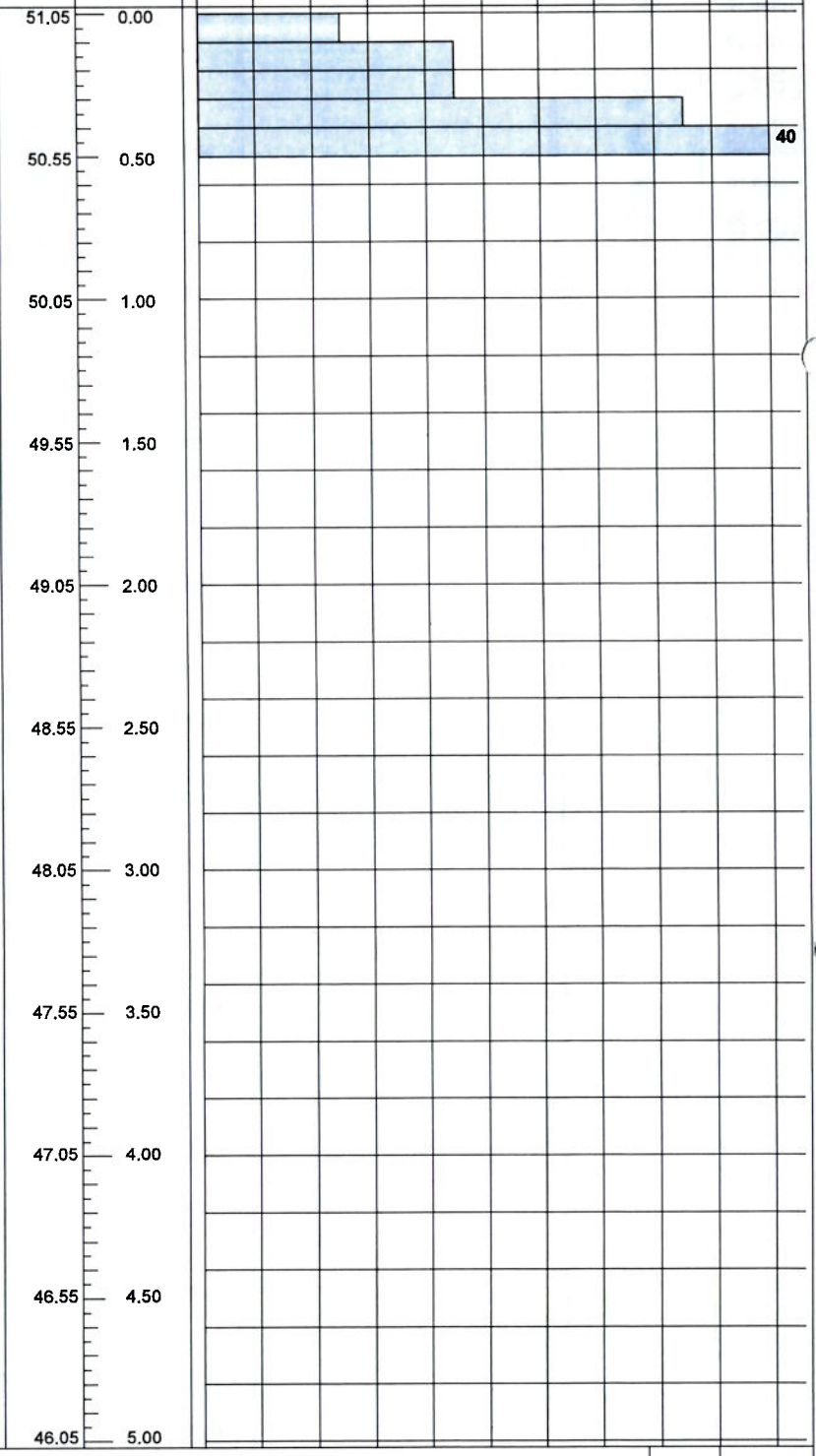
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Site	Probe Number
Coolpowra Galway	DP-13

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	51.05	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582143.4 E 708985.3 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	10	
0.10-0.20	18	
0.20-0.30	18	
0.30-0.40	34	
0.40-0.50	40	



Remarks
Refusal at 0.50m BGL

Scale (approx)	Logged By
1:25	CMP

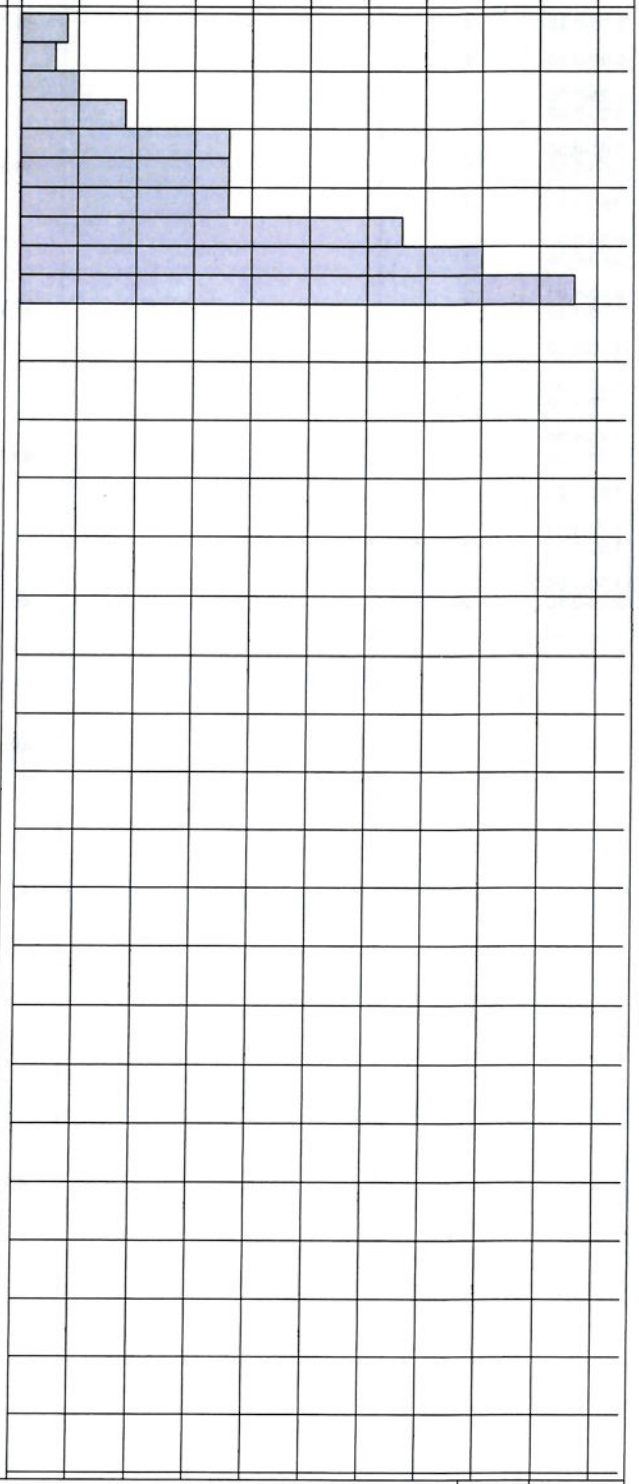
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-14
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.39	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582130.1 E 709145.4 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		51.39	0.00
0.10-0.20	3			
0.20-0.30	5			
0.30-0.40	9			
0.40-0.50	18			
0.50-0.60	18		50.89	0.50
0.60-0.70	18			
0.70-0.80	33			
0.80-0.90	40			
0.90-1.00	48		50.39	1.00
			49.89	1.50
			49.39	2.00
			48.89	2.50
			48.39	3.00
			47.89	3.50
			47.39	4.00
			46.89	4.50
			46.39	5.00



Remarks
Refusal at 1.00m BGL

Scale (approx)	Logged By
1:25	CMP

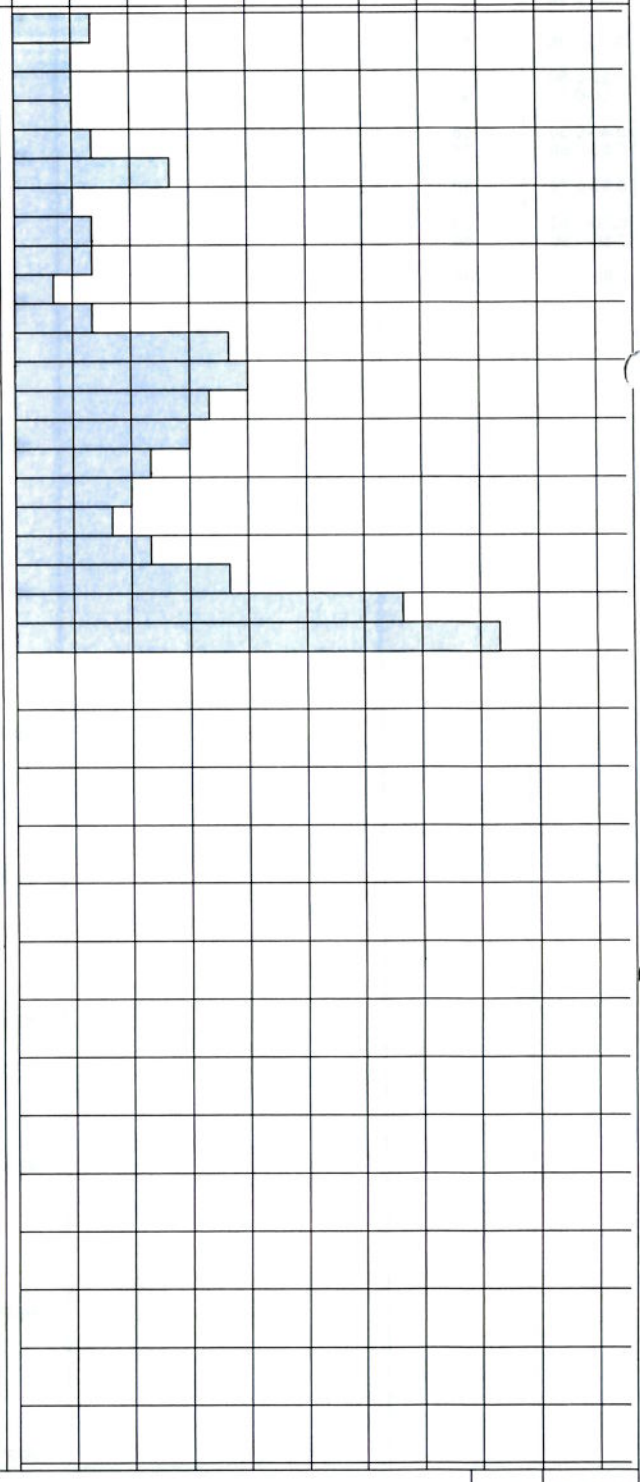
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-15
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 50.71	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582145.6 E 709055.6 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		50.71	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	3			
0.40-0.50	4			
0.50-0.60	8		50.21	0.50
0.60-0.70	3			
0.70-0.80	4			
0.80-0.90	4			
0.90-1.00	2			
1.00-1.10	4		49.71	1.00
1.10-1.20	11			
1.20-1.30	12			
1.30-1.40	10			
1.40-1.50	9			
1.50-1.60	7		49.21	1.50
1.60-1.70	6			
1.70-1.80	5			
1.80-1.90	7			
1.90-2.00	11			
2.00-2.10	20		48.71	2.00
2.10-2.20	25			
			48.21	2.50
			47.71	3.00
			47.21	3.50
			46.71	4.00
			46.21	4.50
			45.71	5.00



Remarks
Refusal at 2.20m BGL

Scale (approx)	Logged By
1:25	CMP

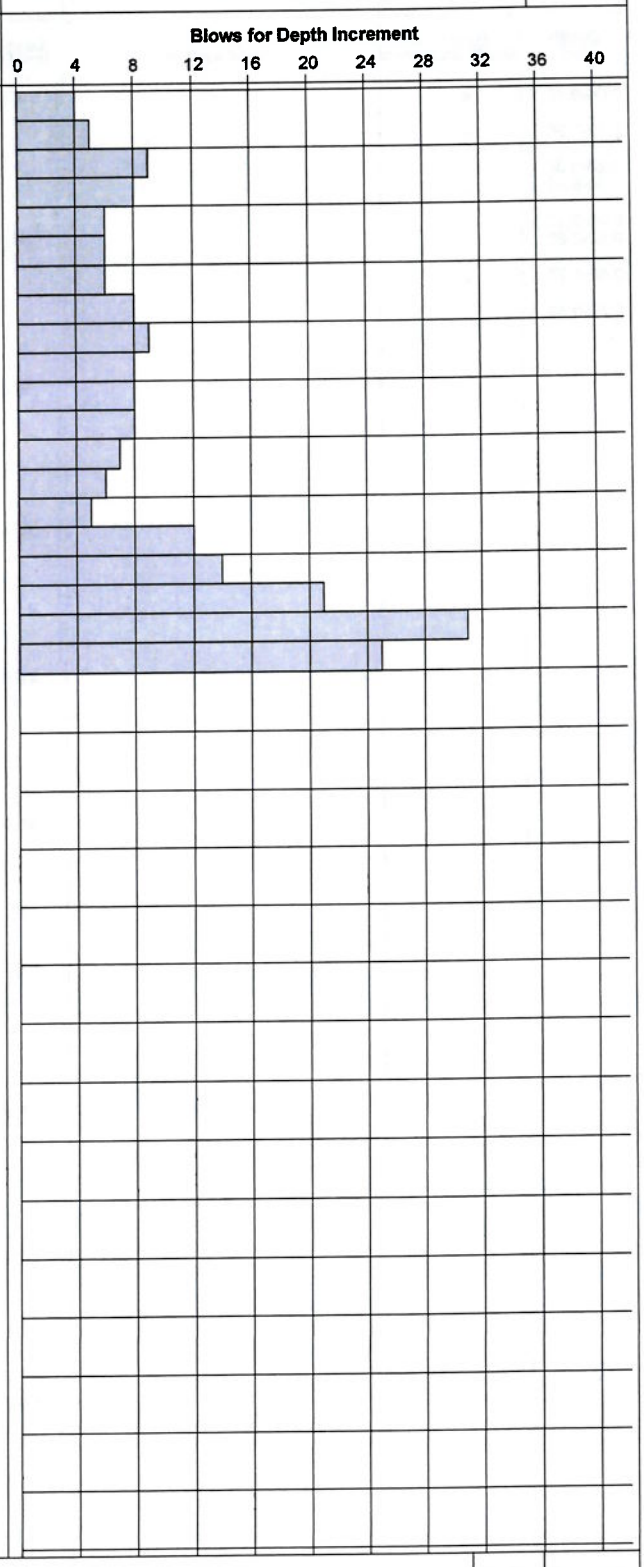
Figure No.
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Site Coolpowra Galway				**Probe Number** DP-16
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.20	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582165 E 709030.9 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		51.20	0.00
0.10-0.20	5			
0.20-0.30	9			
0.30-0.40	8			
0.40-0.50	6			
0.50-0.60	6		50.70	0.50
0.60-0.70	6			
0.70-0.80	8			
0.80-0.90	9			
0.90-1.00	8			
1.00-1.10	8		50.20	1.00
1.10-1.20	8			
1.20-1.30	7			
1.30-1.40	6			
1.40-1.50	5			
1.50-1.60	12		49.70	1.50
1.60-1.70	14			
1.70-1.80	21			
1.80-1.90	31			
1.90-2.00	25		49.20	2.00
			48.70	2.50
			48.20	3.00
			47.70	3.50
			47.20	4.00
			46.70	4.50
			46.20	5.00



Remarks
Refusal at 2.00m BGL

Scale (approx)	Logged By
1:25	CMP

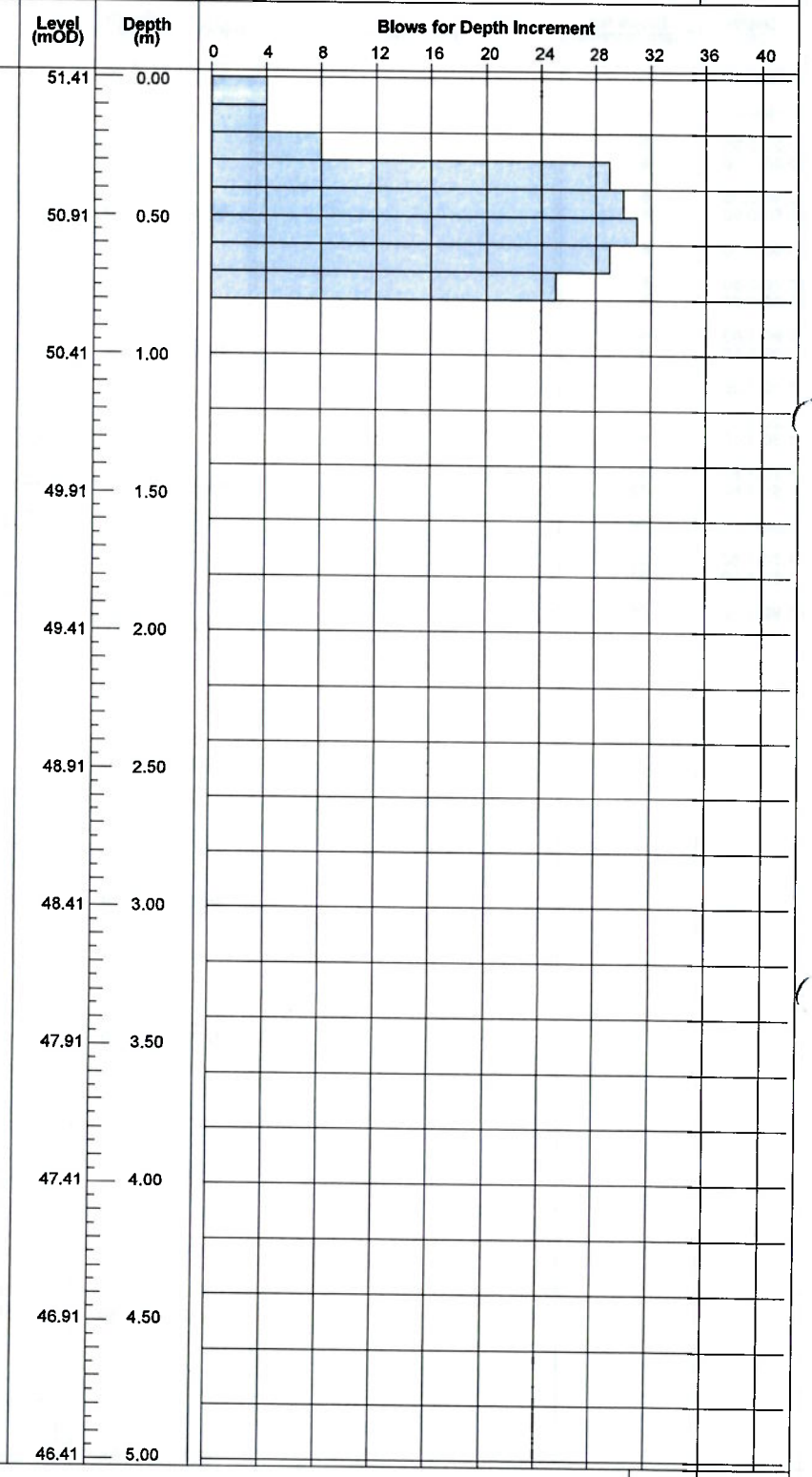
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.41	**Site** Coolpowra Galway	**Probe Number** DP-17
	Location 582179.5 E 709138.7 N	**Dates** 16/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	4	
0.10-0.20	4	
0.20-0.30	8	
0.30-0.40	29	
0.40-0.50	30	
0.50-0.60	31	
0.60-0.70	29	
0.70-0.80	25	



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

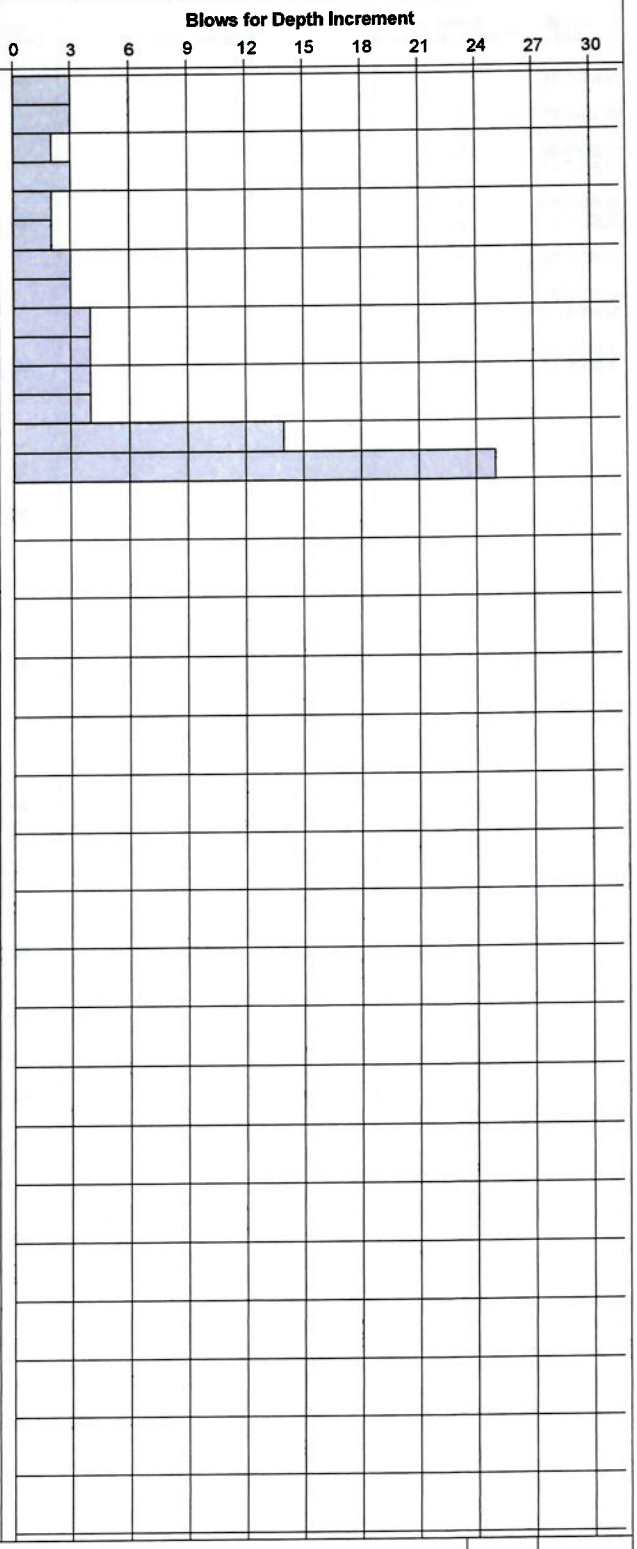
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Site	Probe Number
Coolpowra Galway	DP-18

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	51.52	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582167.5 E 709087.1 N	16/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		51.52	0.00
0.10-0.20	3			
0.20-0.30	2			
0.30-0.40	3			
0.40-0.50	2			
0.50-0.60	2		51.02	0.50
0.60-0.70	3			
0.70-0.80	3			
0.80-0.90	4			
0.90-1.00	4			
1.00-1.10	4		50.52	1.00
1.10-1.20	4			
1.20-1.30	14			
1.30-1.40	25			
			50.02	1.50
			49.52	2.00
			49.02	2.50
			48.52	3.00
			48.02	3.50
			47.52	4.00
			47.02	4.50
			46.52	5.00



Remarks
Refusal at 1.40m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

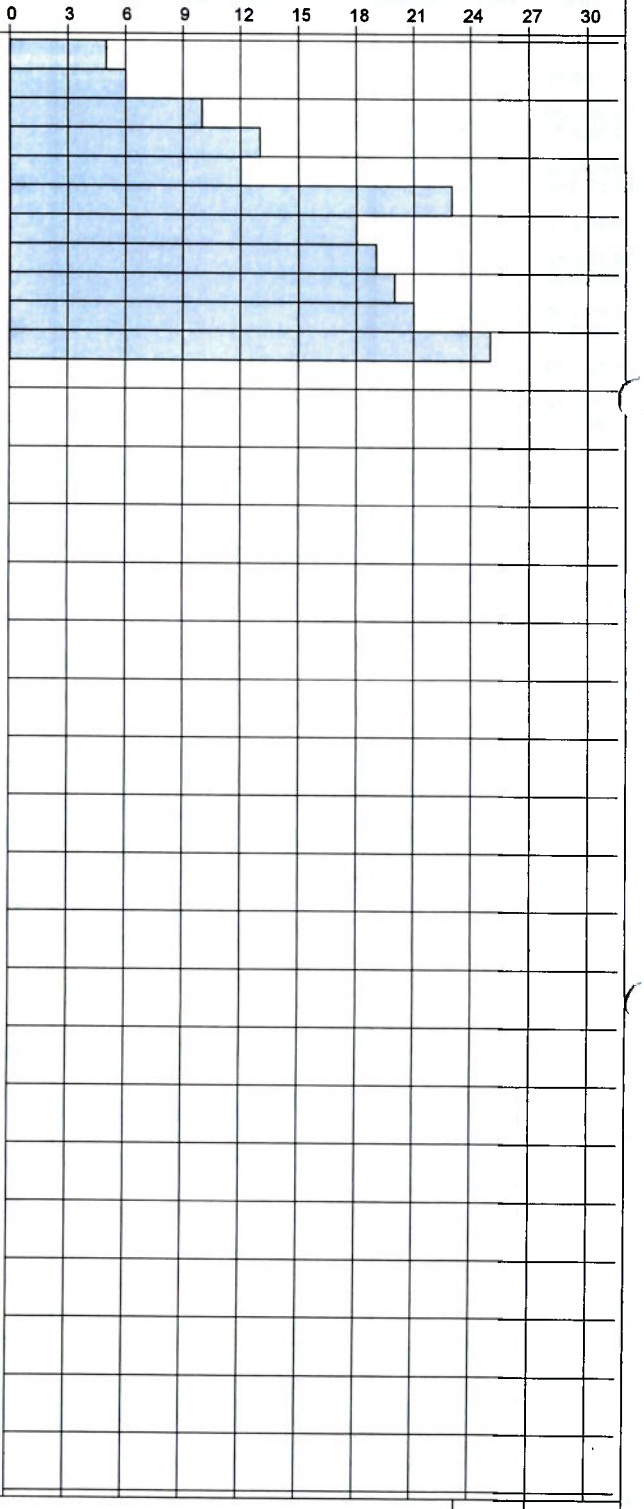
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Site	Probe Number
Coolpowra Galway	DP-19

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	51.64	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582205.9 E 709018.4 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	5		51.64	0.00
0.10-0.20	6			
0.20-0.30	10			
0.30-0.40	13			
0.40-0.50	12			
0.50-0.60	23		51.14	0.50
0.60-0.70	18			
0.70-0.80	19			
0.80-0.90	20			
0.90-1.00	21			
1.00-1.10	25		50.64	1.00
			50.14	1.50
			49.64	2.00
			49.14	2.50
			48.64	3.00
			48.14	3.50
			47.64	4.00
			47.14	4.50
			46.64	5.00



Remarks
Refusal at 1.10m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

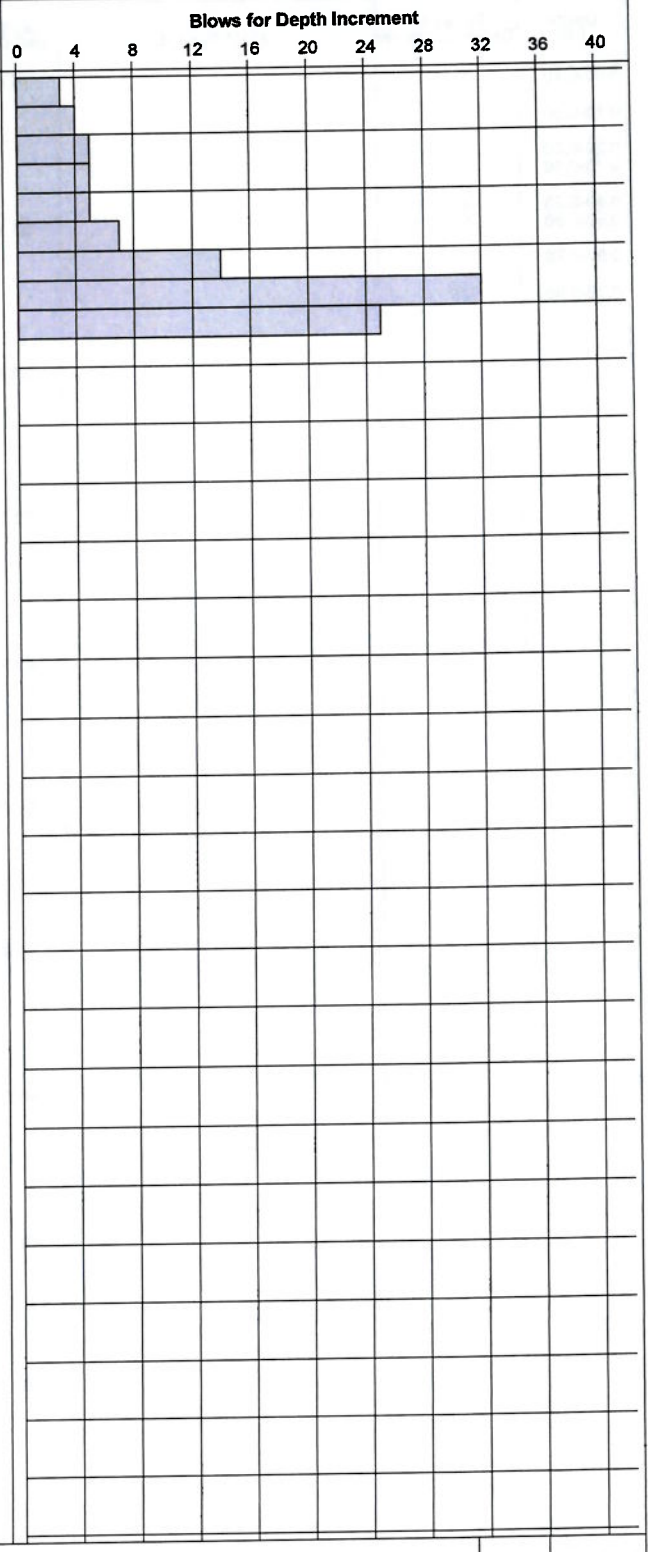
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Site	Probe Number
Coolpowra Galway	DP-20

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	54.42	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582263.8 E 709091.2 N	18/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		54.42	0.00
0.10-0.20	4			
0.20-0.30	5			
0.30-0.40	5			
0.40-0.50	5			
0.50-0.60	7		53.92	0.50
0.60-0.70	14			
0.70-0.80	32			
0.80-0.90	25		53.42	1.00
			52.92	1.50
			52.42	2.00
			51.92	2.50
			51.42	3.00
			50.92	3.50
			50.42	4.00
			49.92	4.50
			49.42	5.00



Remarks
Refusal at 0.90m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

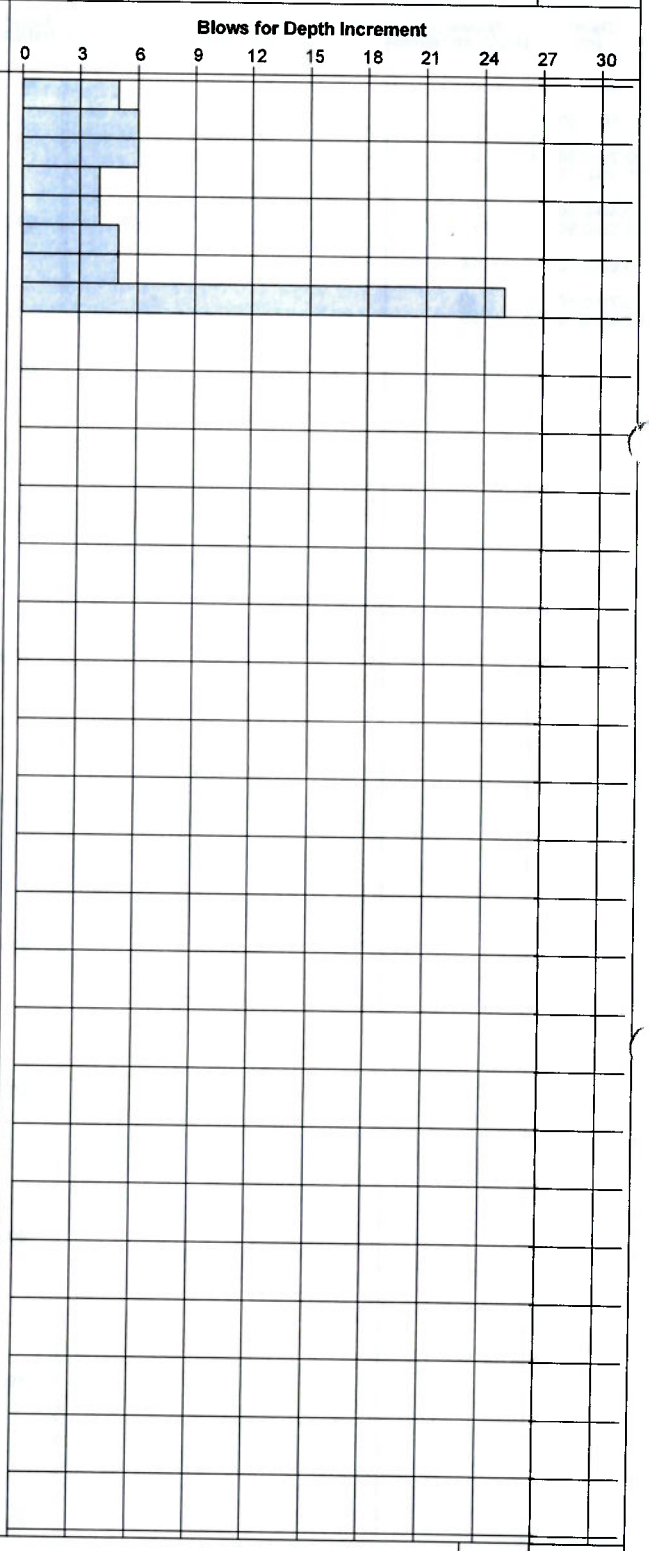
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Site Coolpowra Galway				**Probe Number** DP-21
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 53.67	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582270.5 E 708984.9 N	**Dates** 18/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	5	
0.10-0.20	6	
0.20-0.30	6	
0.30-0.40	4	
0.40-0.50	4	
0.50-0.60	5	
0.60-0.70	5	
0.70-0.80	25	

Level (mOD)	Depth (m)
53.67	0.00
53.17	0.50
52.67	1.00
52.17	1.50
51.67	2.00
51.17	2.50
50.67	3.00
50.17	3.50
49.67	4.00
49.17	4.50
48.67	5.00



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

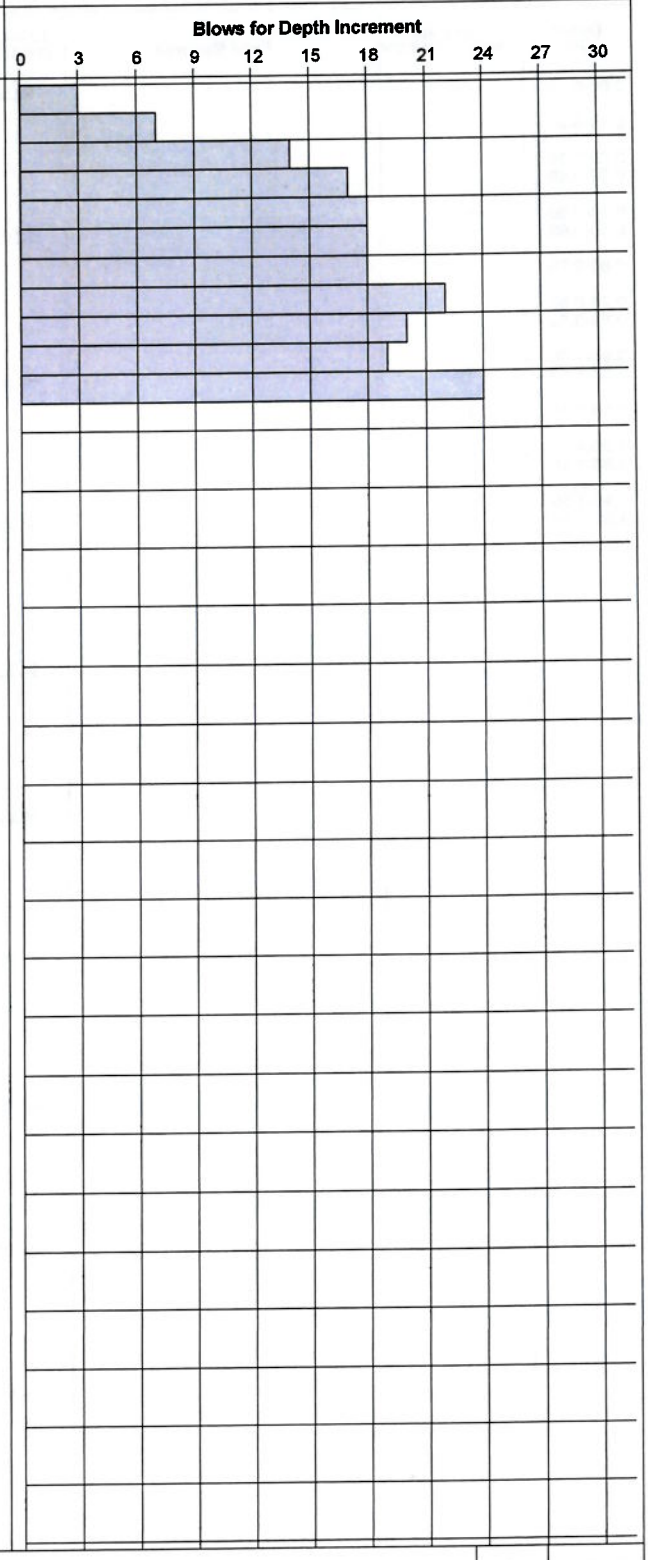
Figure No.
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Site Coolpowra Galway				**Probe Number** DP-22
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.92	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582305.7 E 709123.2 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	7	
0.20-0.30	14	
0.30-0.40	17	
0.40-0.50	18	
0.50-0.60	18	
0.60-0.70	18	
0.70-0.80	22	
0.80-0.90	20	
0.90-1.00	19	
1.00-1.10	24	



Remarks
Refusal at 1.10m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

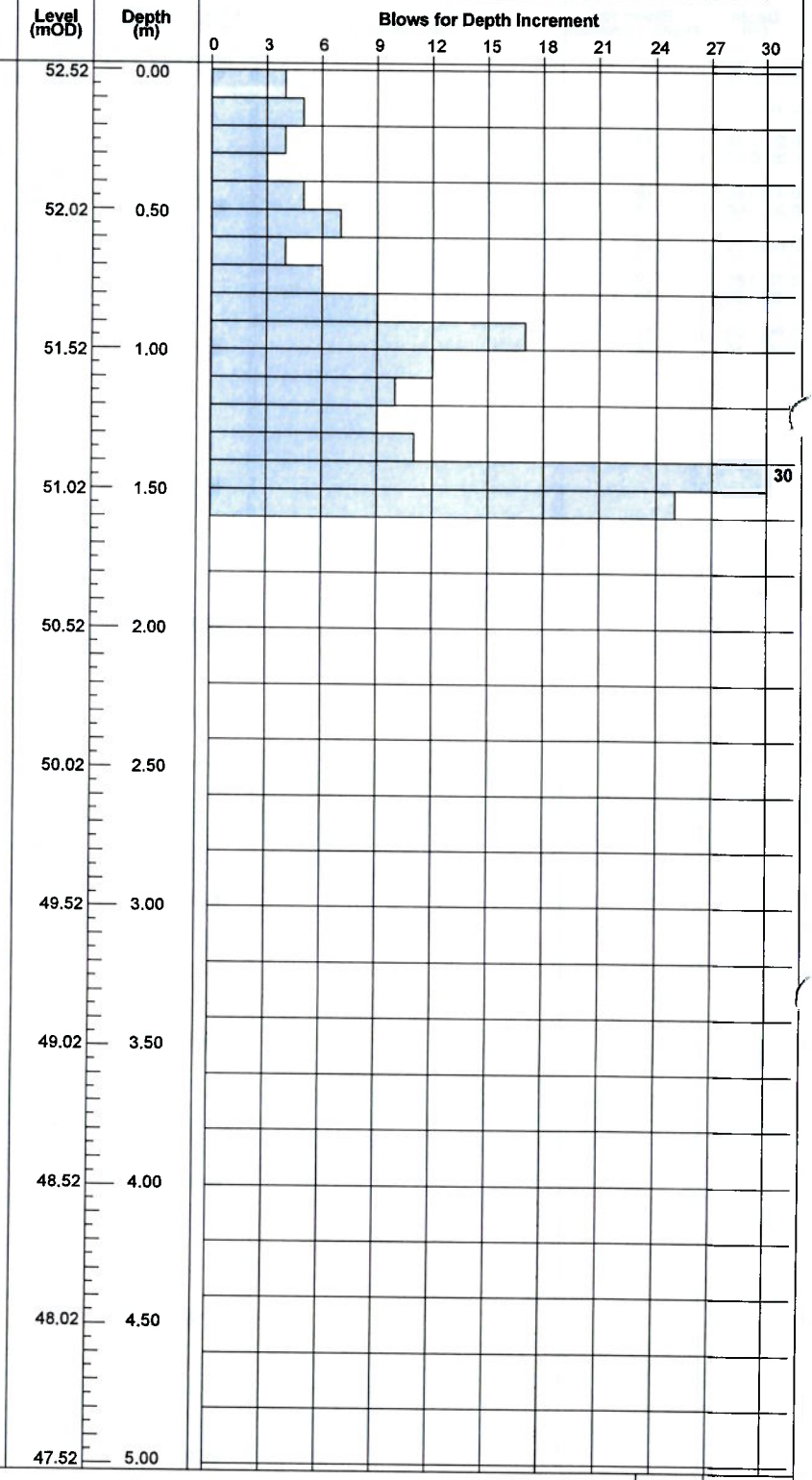
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Site	Probe Number
Coolpowra Galway	DP-23

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.52	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582307.5 E 709058.9 N	18/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	4	
0.10-0.20	5	
0.20-0.30	4	
0.30-0.40	3	
0.40-0.50	5	
0.50-0.60	7	
0.60-0.70	4	
0.70-0.80	6	
0.80-0.90	9	
0.90-1.00	17	
1.00-1.10	12	
1.10-1.20	10	
1.20-1.30	9	
1.30-1.40	11	
1.40-1.50	30	
1.50-1.60	25	



Remarks
Refusal at 1.60m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

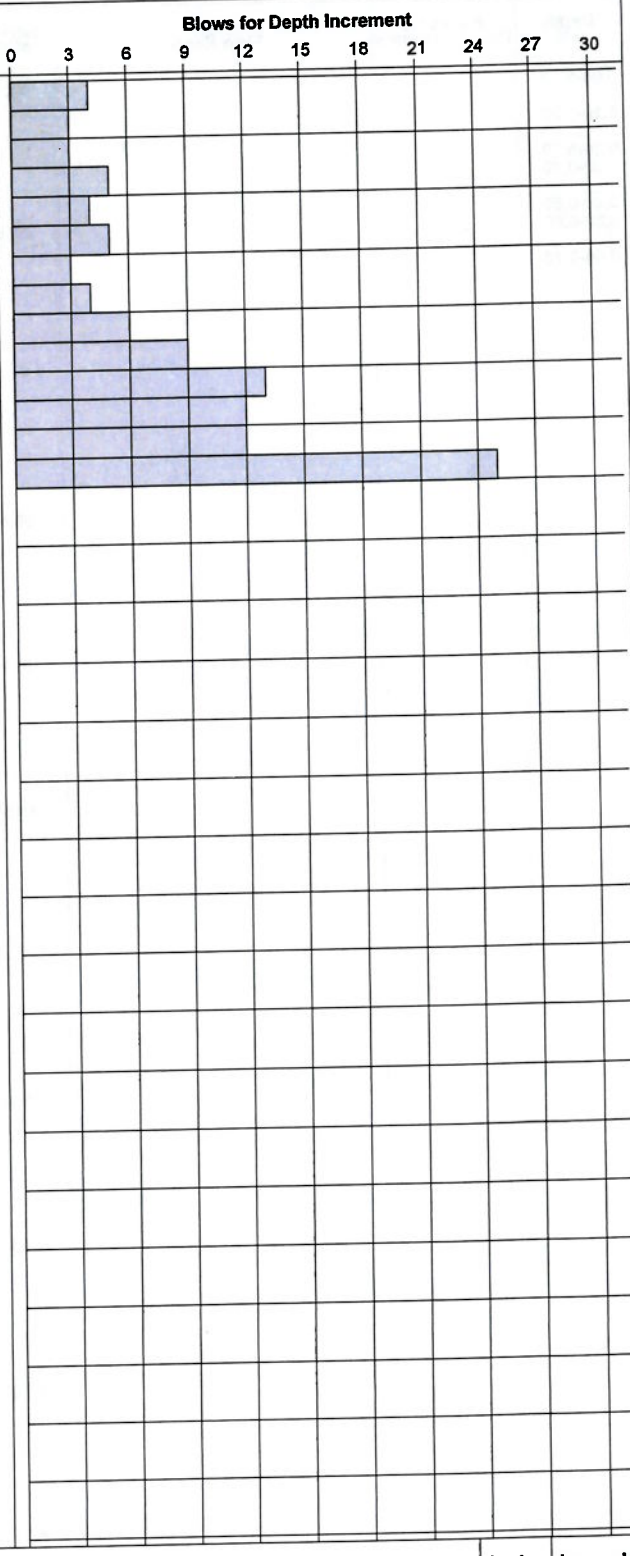
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Site	Probe Number
Coolpowra Galway	DP-24

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	53.43	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582340.4 E 708975.2 N	18/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		53.43	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	5			
0.40-0.50	4		52.93	0.50
0.50-0.60	5			
0.60-0.70	3			
0.70-0.80	4			
0.80-0.90	6			
0.90-1.00	9		52.43	1.00
1.00-1.10	13			
1.10-1.20	12			
1.20-1.30	12			
1.30-1.40	25			
			51.93	1.50
			51.43	2.00
			50.93	2.50
			50.43	3.00
			49.93	3.50
			49.43	4.00
			48.93	4.50
			48.43	5.00



Remarks
Refusal at 1.40m BGL

Scale (approx)	Logged By
1:25	CMP

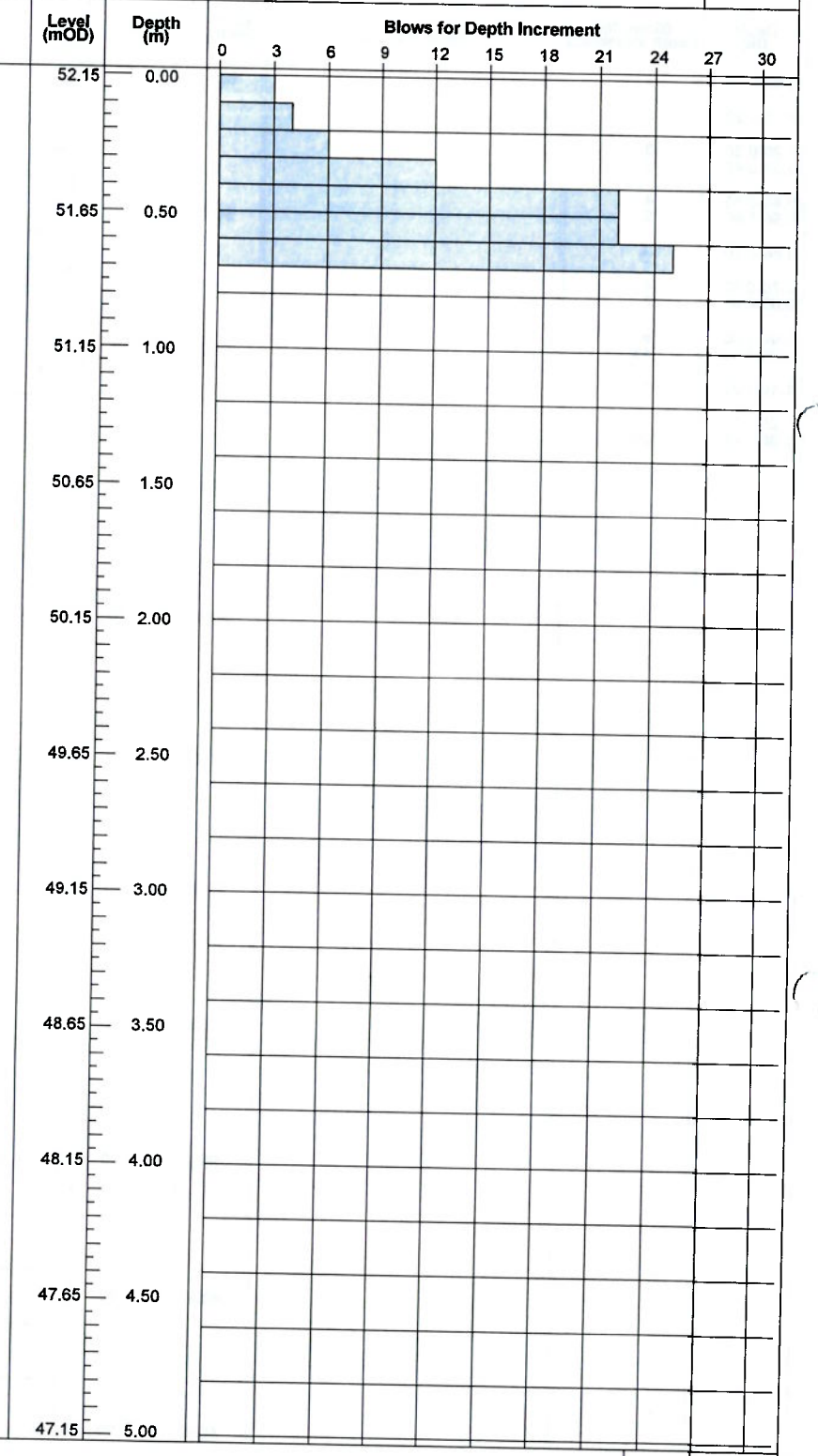
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Site Coolpowra Galway				**Probe Number** DP-25
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 52.15	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582345.1 E 709189.4 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	4	
0.20-0.30	6	
0.30-0.40	12	
0.40-0.50	22	
0.50-0.60	22	
0.60-0.70	25	



Remarks
Refusal at 0.70m BGL

Scale (approx)	Logged By
1:25	CMP

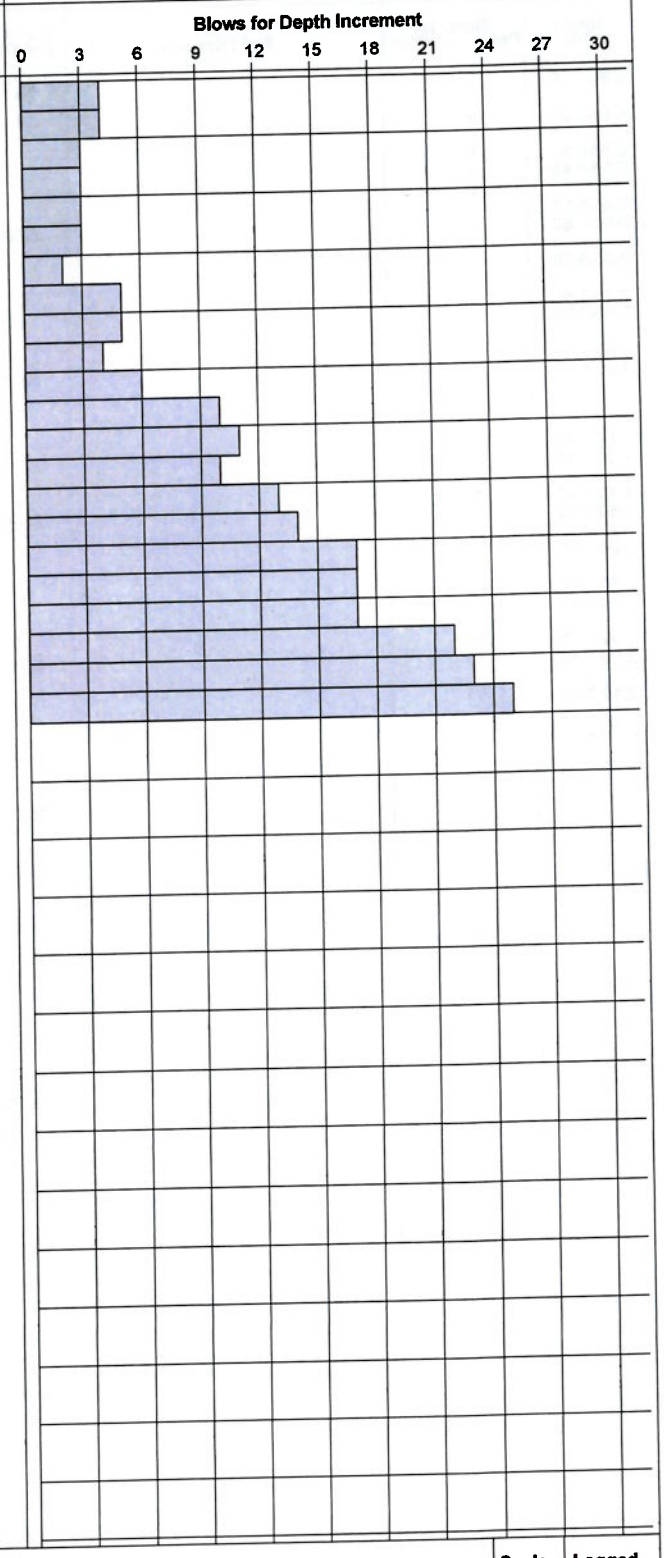
Figure No.
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Site Coolpowra Galway				**Probe Number** DP-26
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.77	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582371.3 E 709142.9 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		51.77	0.00
0.10-0.20	4			
0.20-0.30	3			
0.30-0.40	3			
0.40-0.50	3		51.27	0.50
0.50-0.60	3			
0.60-0.70	2			
0.70-0.80	5			
0.80-0.90	5			
0.90-1.00	4		50.77	1.00
1.00-1.10	6			
1.10-1.20	10			
..20-1.30	11			
1.30-1.40	10			
1.40-1.50	13		50.27	1.50
1.50-1.60	14			
1.60-1.70	17			
1.70-1.80	17			
1.80-1.90	17			
1.90-2.00	22		49.77	2.00
2.00-2.10	23			
2.10-2.20	25			
			49.27	2.50
			48.77	3.00
			48.27	3.50
			47.77	4.00
			47.27	4.50
			46.77	5.00



Remarks
Refusal at 2.20m BGL

Scale (approx)	Logged By
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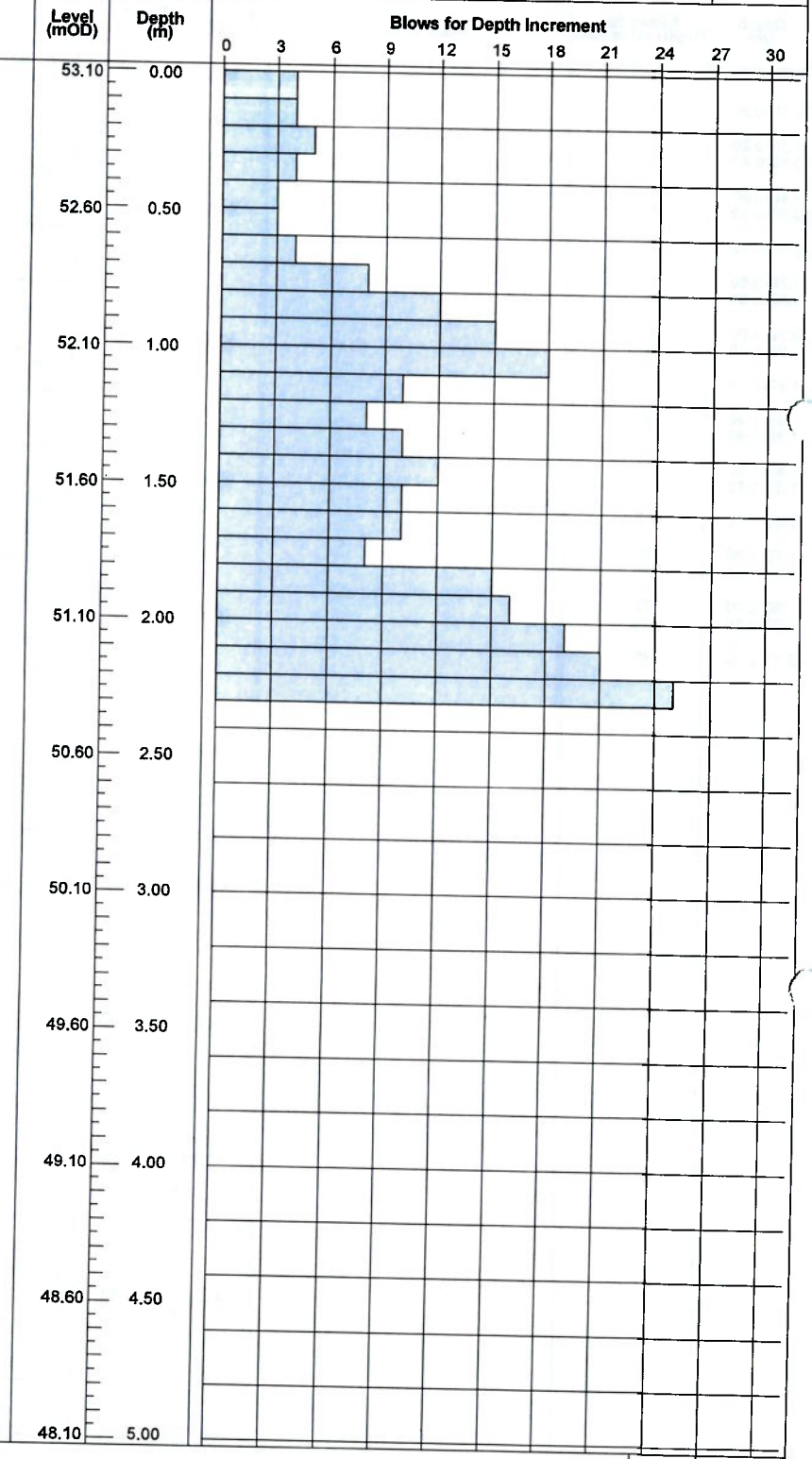
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 53.10	**Site** Coolpowra Galway	**Probe Number** DP-27
	Location 582388.4 E 709060.9 N	**Dates** 18/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	4	
0.10-0.20	4	
0.20-0.30	5	
0.30-0.40	4	
0.40-0.50	3	
0.50-0.60	3	
0.60-0.70	4	
0.70-0.80	8	
0.80-0.90	12	
0.90-1.00	15	
1.00-1.10	18	
1.10-1.20	10	
1.20-1.30	8	
1.30-1.40	10	
1.40-1.50	12	
1.50-1.60	10	
1.60-1.70	10	
1.70-1.80	8	
1.80-1.90	15	
1.90-2.00	16	
2.00-2.10	19	
2.10-2.20	21	
2.20-2.30	25	



Remarks
Refusal at 2.30m BGL

Scale (approx)	Logged By
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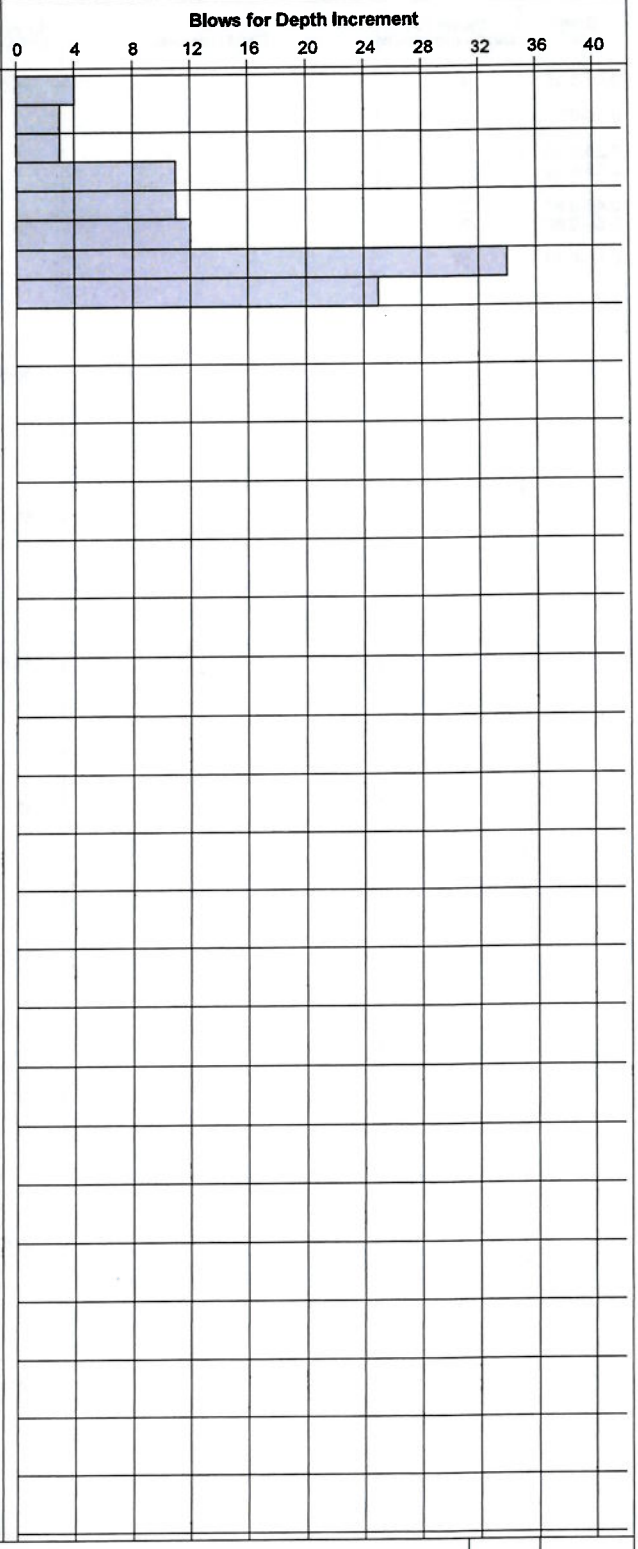
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-28
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 53.20	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582382.2 E 709017.9 N	**Dates** 18/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		53.20	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	11			
0.40-0.50	11			
0.50-0.60	12		52.70	0.50
0.60-0.70	34			
0.70-0.80	25			
			52.20	1.00
			51.70	1.50
			51.20	2.00
			50.70	2.50
			50.20	3.00
			49.70	3.50
			49.20	4.00
			48.70	4.50
			48.20	5.00



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
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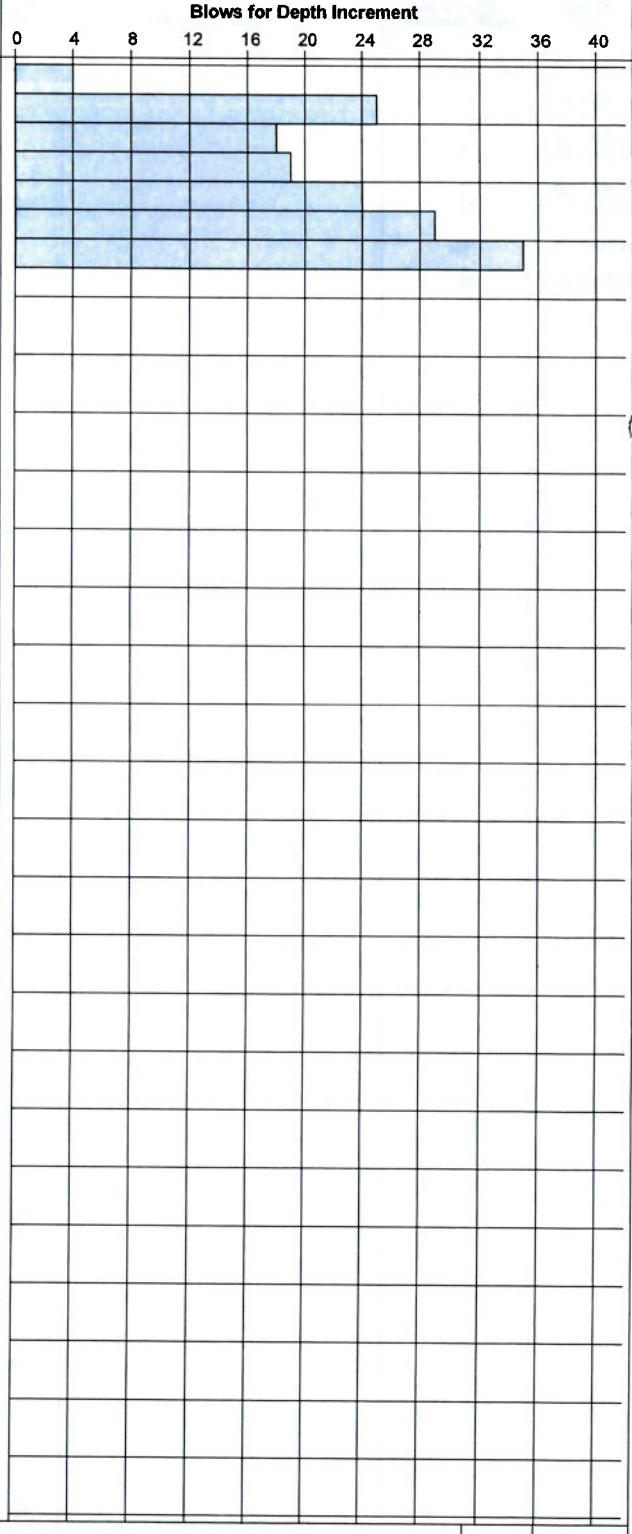
Figure No.
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Site Coolpowra Galway				**Probe Number** DP-29
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 54.60	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582354.3 E 709279.8 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		54.60	0.00
0.10-0.20	25			
0.20-0.30	18			
0.30-0.40	19			
0.40-0.50	24			
0.50-0.60	29		54.10	0.50
0.60-0.70	35			
			53.60	1.00
			53.10	1.50
			52.60	2.00
			52.10	2.50
			51.60	3.00
			51.10	3.50
			50.60	4.00
			50.10	4.50
			49.60	5.00



Remarks
Refusal at 0.70m BGL

Scale (approx)	Logged By
1:25	CMP

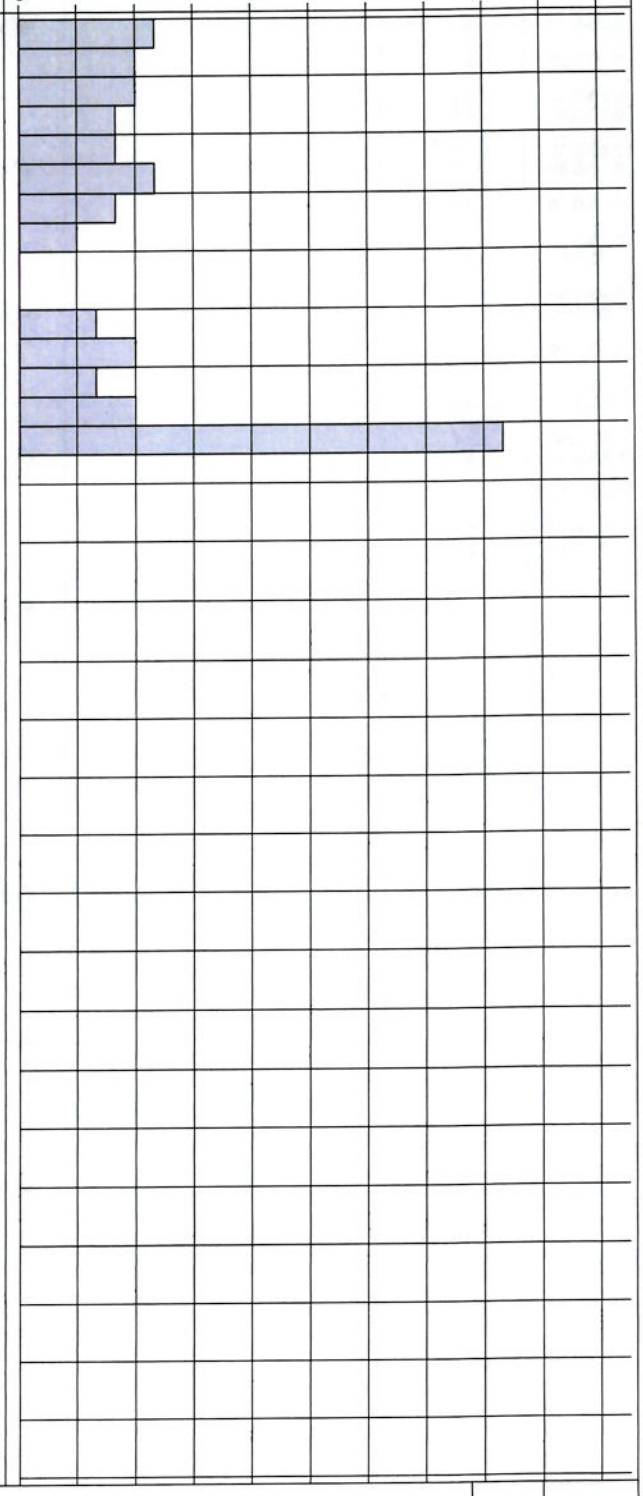
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-30
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 54.84	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582379.8 E 709336.4 N	**Dates** 17/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	7		54.84	0.00
0.10-0.20	6			
0.20-0.30	6			
0.30-0.40	5			
0.40-0.50	5			
0.50-0.60	7		54.34	0.50
0.60-0.70	5			
0.70-0.80	3			
0.80-0.90	0			
0.90-1.00	0			
1.00-1.10	4		53.84	1.00
1.10-1.20	6			
1.20-1.30	4			
1.30-1.40	6			
1.40-1.50	25		53.34	1.50
			52.84	2.00
			52.34	2.50
			51.84	3.00
			51.34	3.50
			50.84	4.00
			50.34	4.50
			49.84	5.00



Remarks
Refusal at 1.50m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

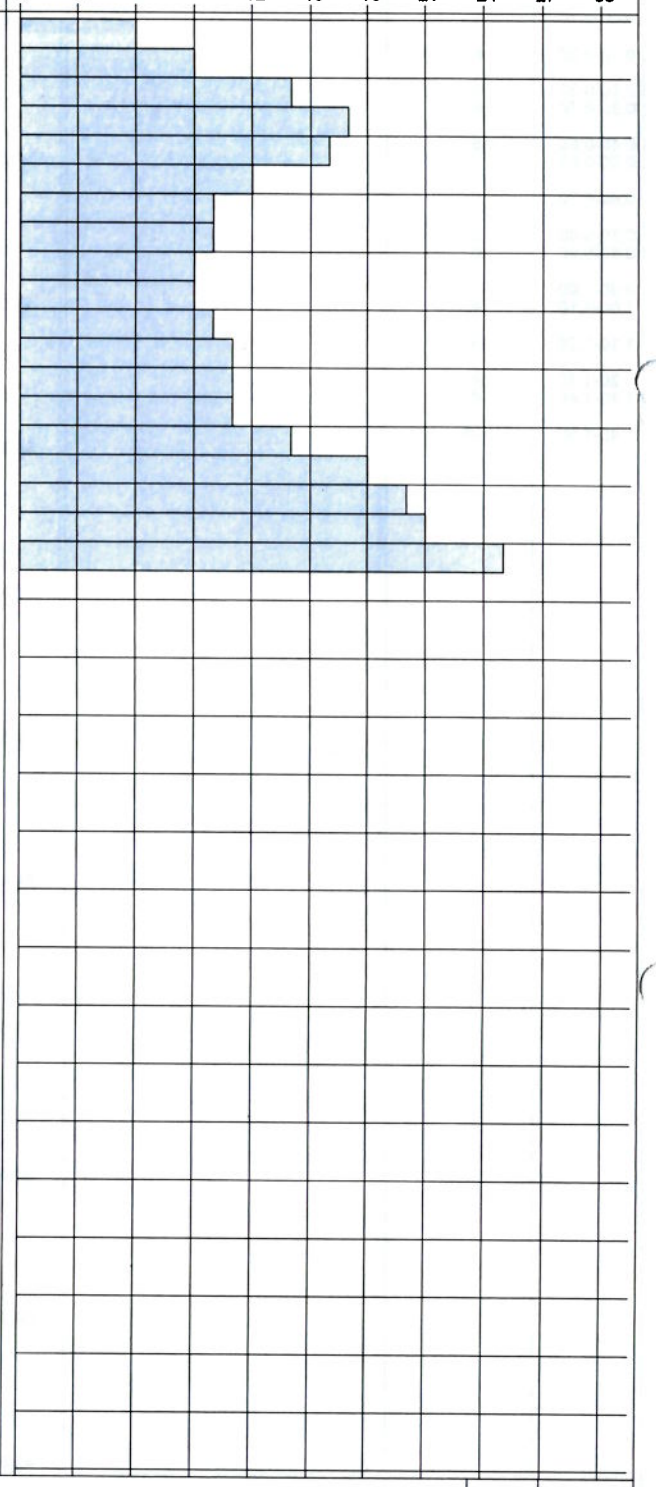
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Site	Probe Number
Coolpowra Galway	DP-31

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.04	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582428.9 E 709213.4 N	16/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		52.04	0.00
0.10-0.20	9			
0.20-0.30	14			
0.30-0.40	17			
0.40-0.50	16			
0.50-0.60	12		51.54	0.50
0.60-0.70	10			
0.70-0.80	10			
0.80-0.90	9			
0.90-1.00	9			
1.00-1.10	10		51.04	1.00
1.10-1.20	11			
1.20-1.30	11			
1.30-1.40	11			
1.40-1.50	14			
1.50-1.60	18		50.54	1.50
1.60-1.70	20			
1.70-1.80	21			
1.80-1.90	25			
			50.04	2.00
			49.54	2.50
			49.04	3.00
			48.54	3.50
			48.04	4.00
			47.54	4.50
			47.04	5.00



Remarks
Refusal at 1.90m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

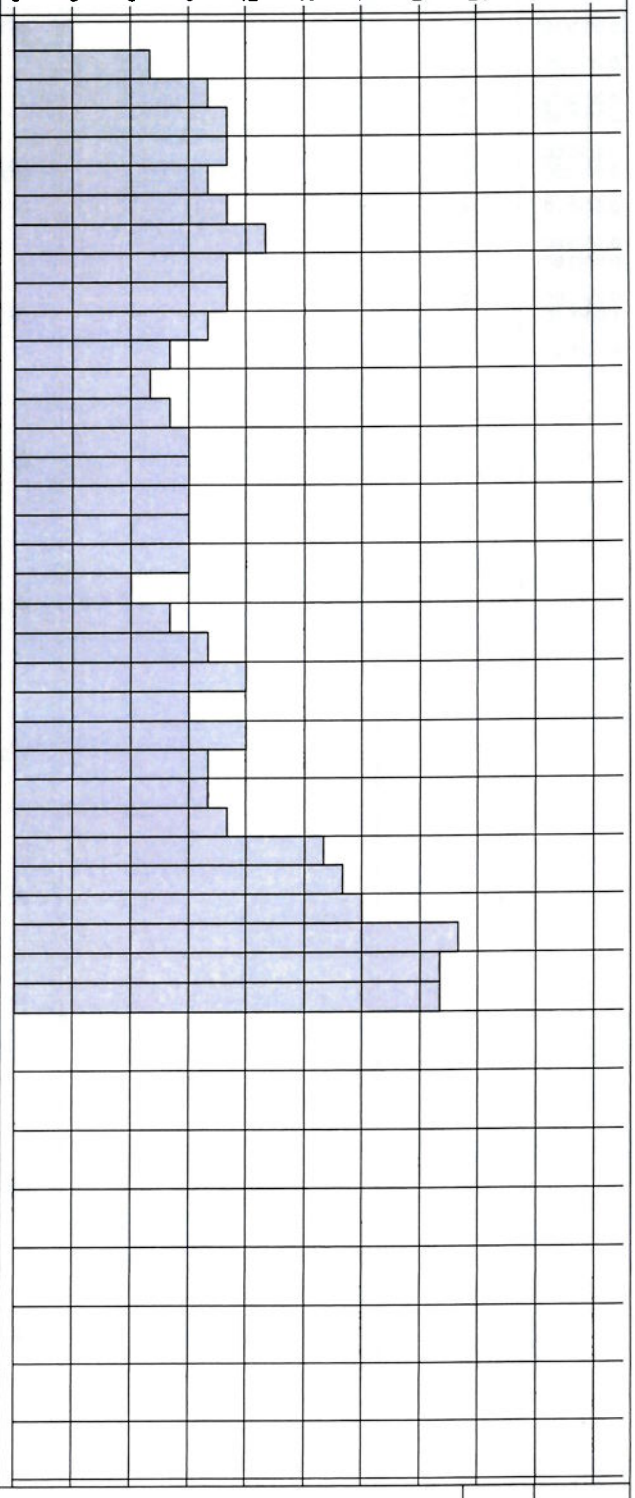
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Site	Probe Number
Coolpowra Galway	DP-32

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.19	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582432.9 E 709148.2 N	16/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		52.19	0.00
0.10-0.20	7			
0.20-0.30	10			
0.30-0.40	11			
0.40-0.50	11			
0.50-0.60	10		51.69	0.50
0.60-0.70	11			
0.70-0.80	13			
0.80-0.90	11			
0.90-1.00	11			
1.00-1.10	10		51.19	1.00
1.10-1.20	8			
1.20-1.30	7			
1.30-1.40	8			
1.40-1.50	9			
1.50-1.60	9		50.69	1.50
1.60-1.70	9			
1.70-1.80	9			
1.80-1.90	9			
1.90-2.00	6			
2.00-2.10	8		50.19	2.00
2.10-2.20	10			
2.20-2.30	12			
2.30-2.40	9			
2.40-2.50	12			
2.50-2.60	10		49.69	2.50
2.60-2.70	10			
2.70-2.80	11			
2.80-2.90	16			
2.90-3.00	17			
3.00-3.10	18		49.19	3.00
3.10-3.20	23			
3.20-3.30	22			
3.30-3.40	22			
			48.69	3.50
			48.19	4.00
			47.69	4.50
			47.19	5.00



Remarks
Refusal at 3.40m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

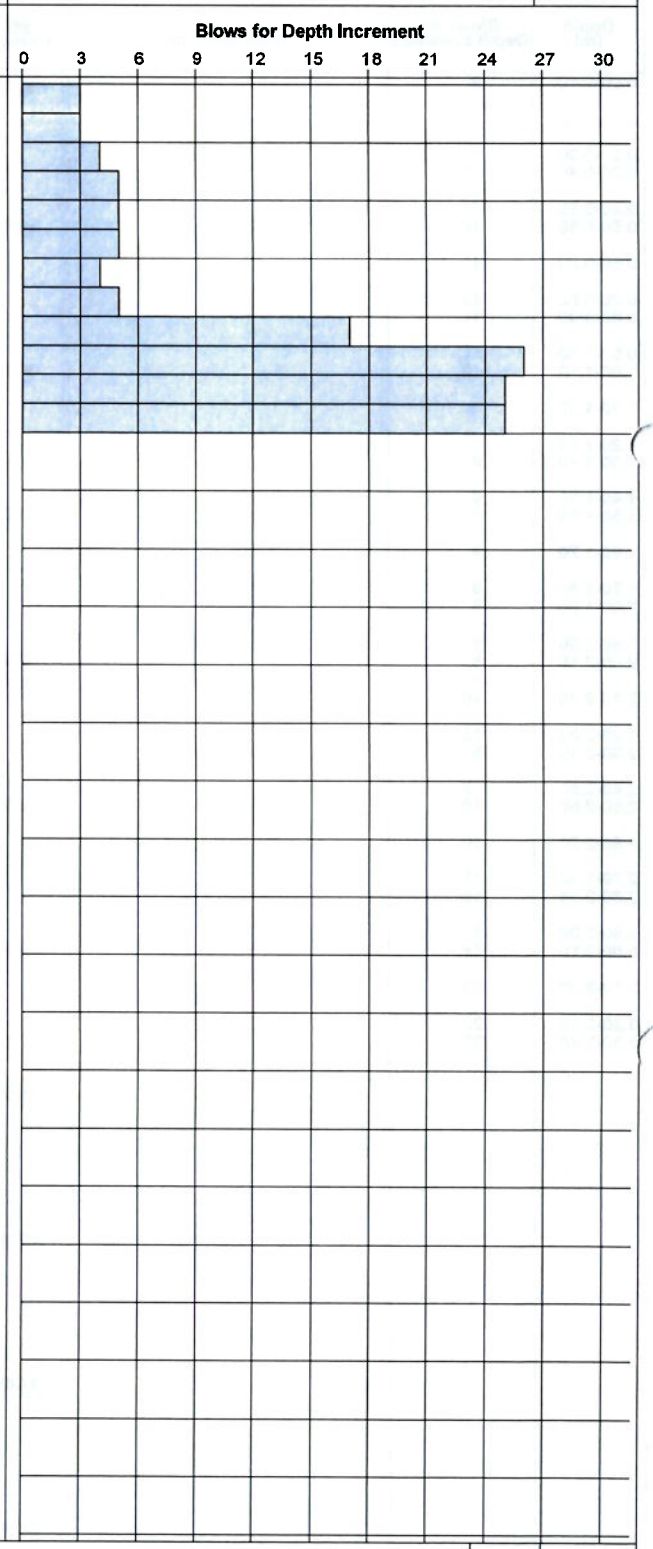
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Site	Probe Number
Coolpowra Galway	DP-33

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	53.74	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582464.6 E 709086.7 N	16/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		53.74	0.00
0.10-0.20	3			
0.20-0.30	4			
0.30-0.40	5			
0.40-0.50	5			
0.50-0.60	5		53.24	0.50
0.60-0.70	4			
0.70-0.80	5			
0.80-0.90	17			
0.90-1.00	26			
1.00-1.10	25		52.74	1.00
1.10-1.20	25			
			52.24	1.50
			51.74	2.00
			51.24	2.50
			50.74	3.00
			50.24	3.50
			49.74	4.00
			49.24	4.50
			48.74	5.00



Remarks
Refusal at 1.20m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

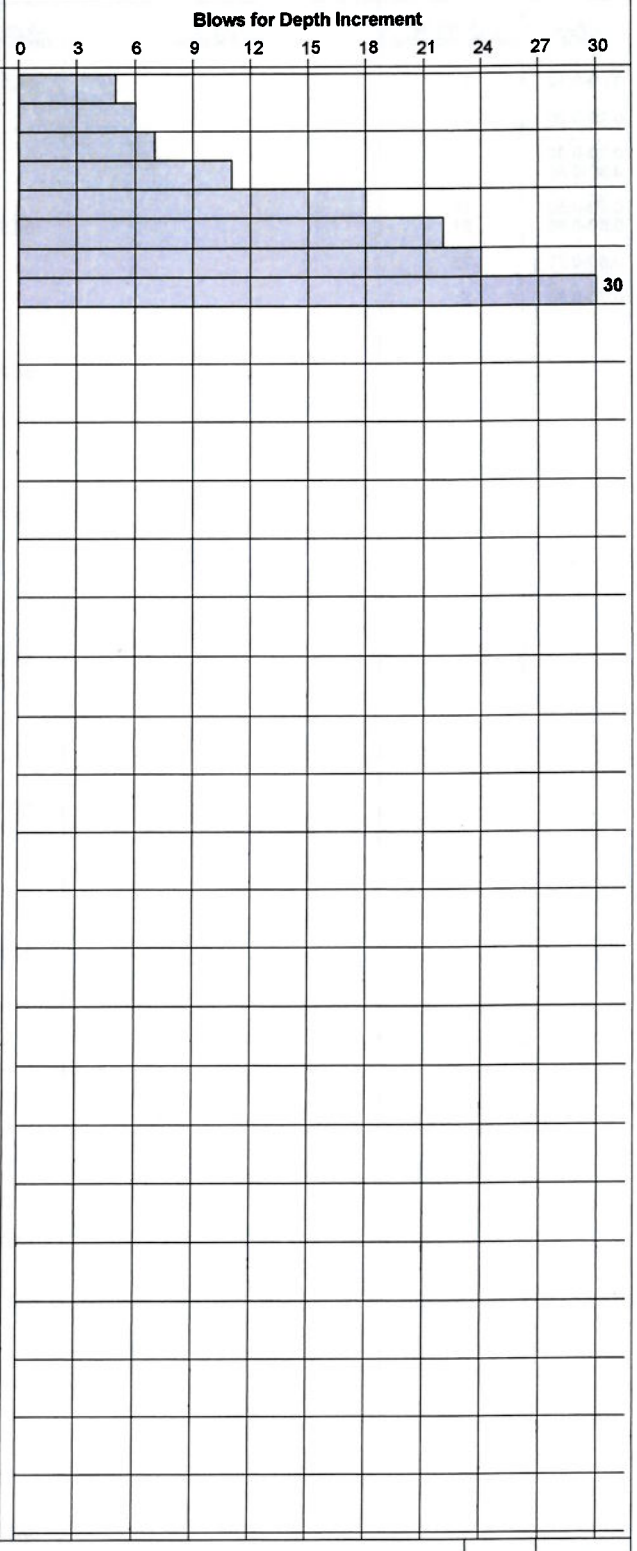
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Site	Probe Number
Coolpowra Galway	DP-34

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	55.29	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582449.8 E 709289.3 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	5		55.29	0.00
0.10-0.20	6			
0.20-0.30	7			
0.30-0.40	11			
0.40-0.50	18			
0.50-0.60	22		54.79	0.50
0.60-0.70	24			
0.70-0.80	30			
			54.29	1.00
			53.79	1.50
			53.29	2.00
			52.79	2.50
			52.29	3.00
			51.79	3.50
			51.29	4.00
			50.79	4.50
			50.29	5.00



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

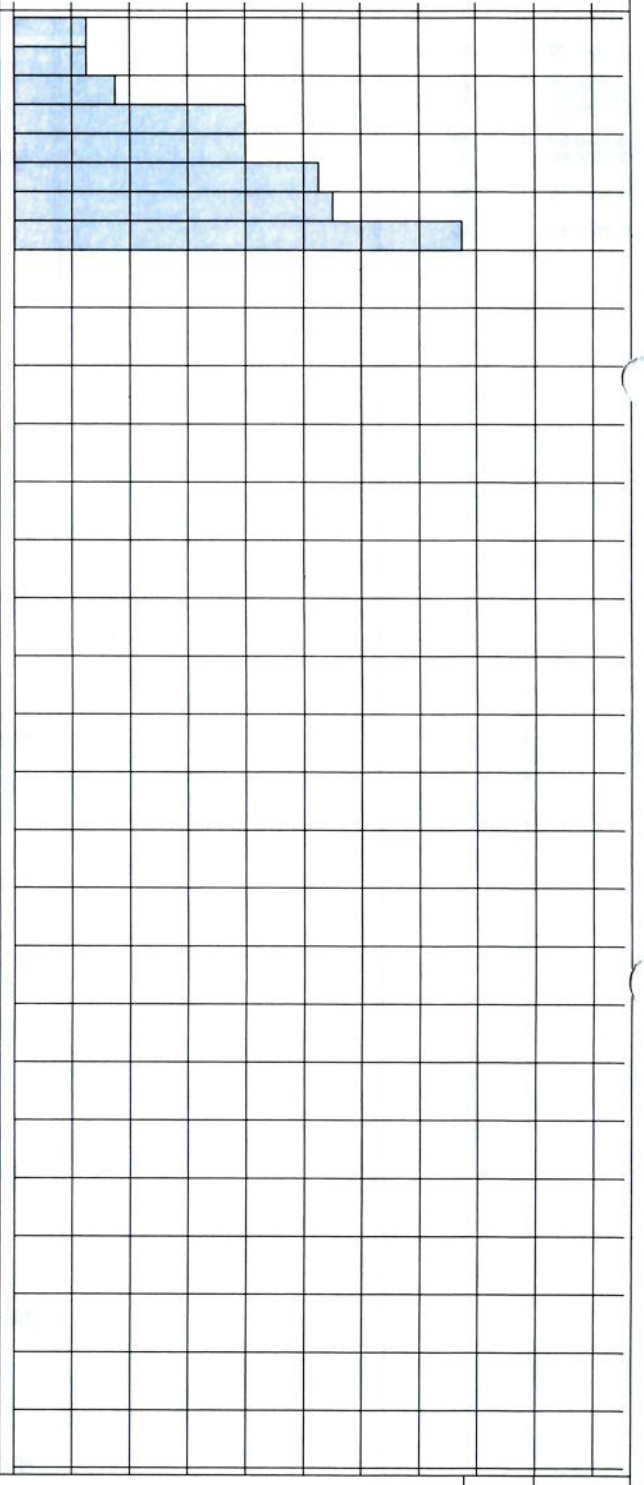
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Site	Probe Number
Coolpowra Galway	DP-35

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	55.31	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582477.4 E 709324.4 N	17/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	5		55.31	0.00
0.10-0.20	5			
0.20-0.30	7			
0.30-0.40	16			
0.40-0.50	16			
0.50-0.60	21		54.81	0.50
0.60-0.70	22			
0.70-0.80	31			
			54.31	1.00
			53.81	1.50
			53.31	2.00
			52.81	2.50
			52.31	3.00
			51.81	3.50
			51.31	4.00
			50.81	4.50
			50.31	5.00



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

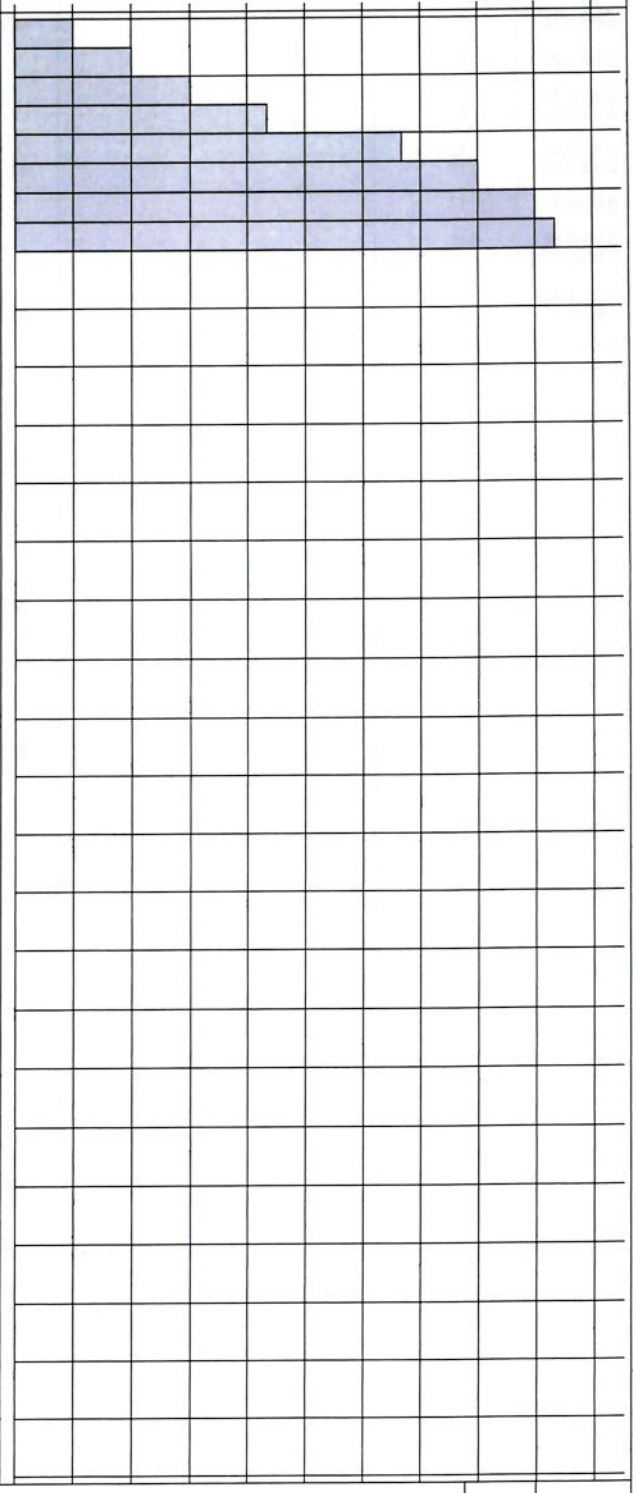
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Site	Probe Number
Coolpowra Galway	DP-36

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.23	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582475.7 E 709236.4 N	16/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		52.23	0.00
0.10-0.20	6			
0.20-0.30	9			
0.30-0.40	13			
0.40-0.50	20			
0.50-0.60	24		51.73	0.50
0.60-0.70	27			
0.70-0.80	28			
			51.23	1.00
			50.73	1.50
			50.23	2.00
			49.73	2.50
			49.23	3.00
			48.73	3.50
			48.23	4.00
			47.73	4.50
			47.23	5.00



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

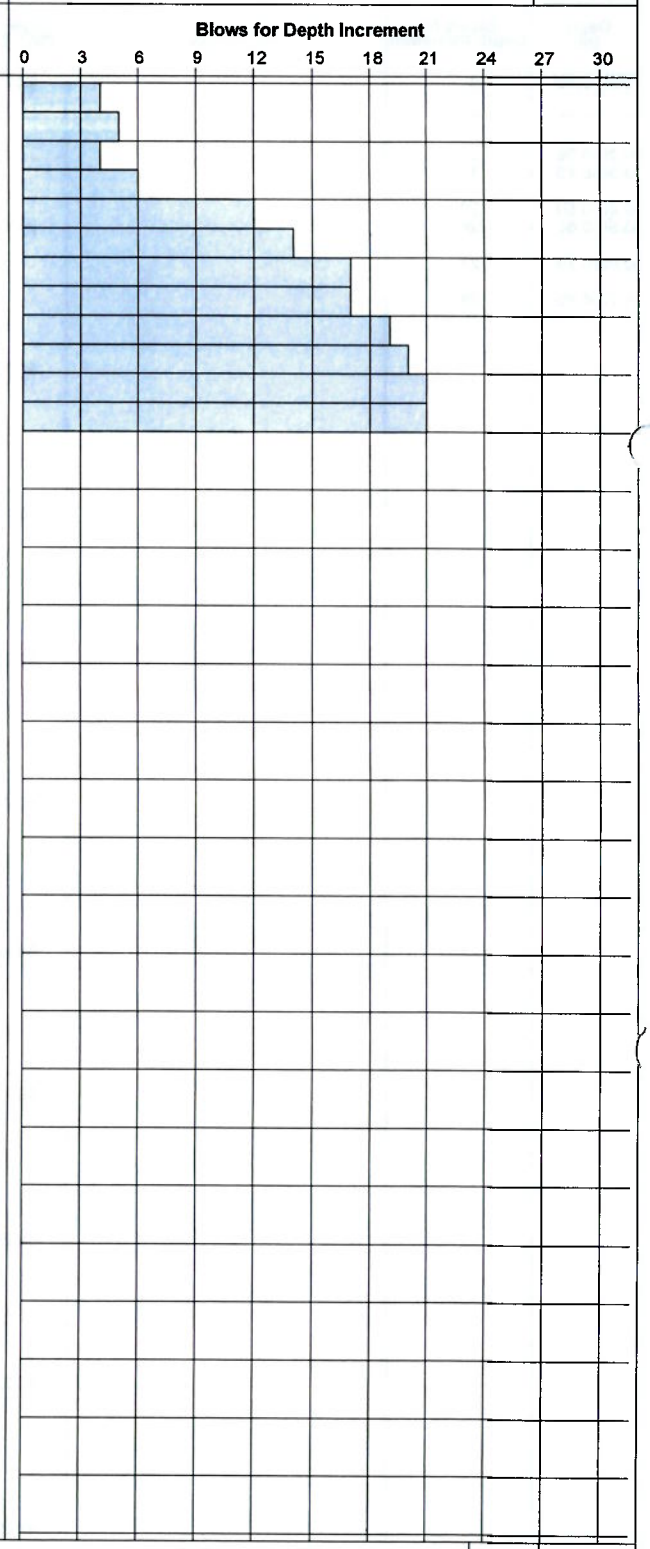
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** DP-37
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 54.66	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582519.9 E 709164.1 N	**Dates** 16/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	4		54.66	0.00
0.10-0.20	5			
0.20-0.30	4			
0.30-0.40	6			
0.40-0.50	12			
0.50-0.60	14		54.16	0.50
0.60-0.70	17			
0.70-0.80	17			
0.80-0.90	19			
0.90-1.00	20			
1.00-1.10	21		53.66	1.00
1.10-1.20	21			
			53.16	1.50
			52.66	2.00
			52.16	2.50
			51.66	3.00
			51.16	3.50
			50.66	4.00
			50.16	4.50
			49.66	5.00



Remarks
Refusal at 1.20m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

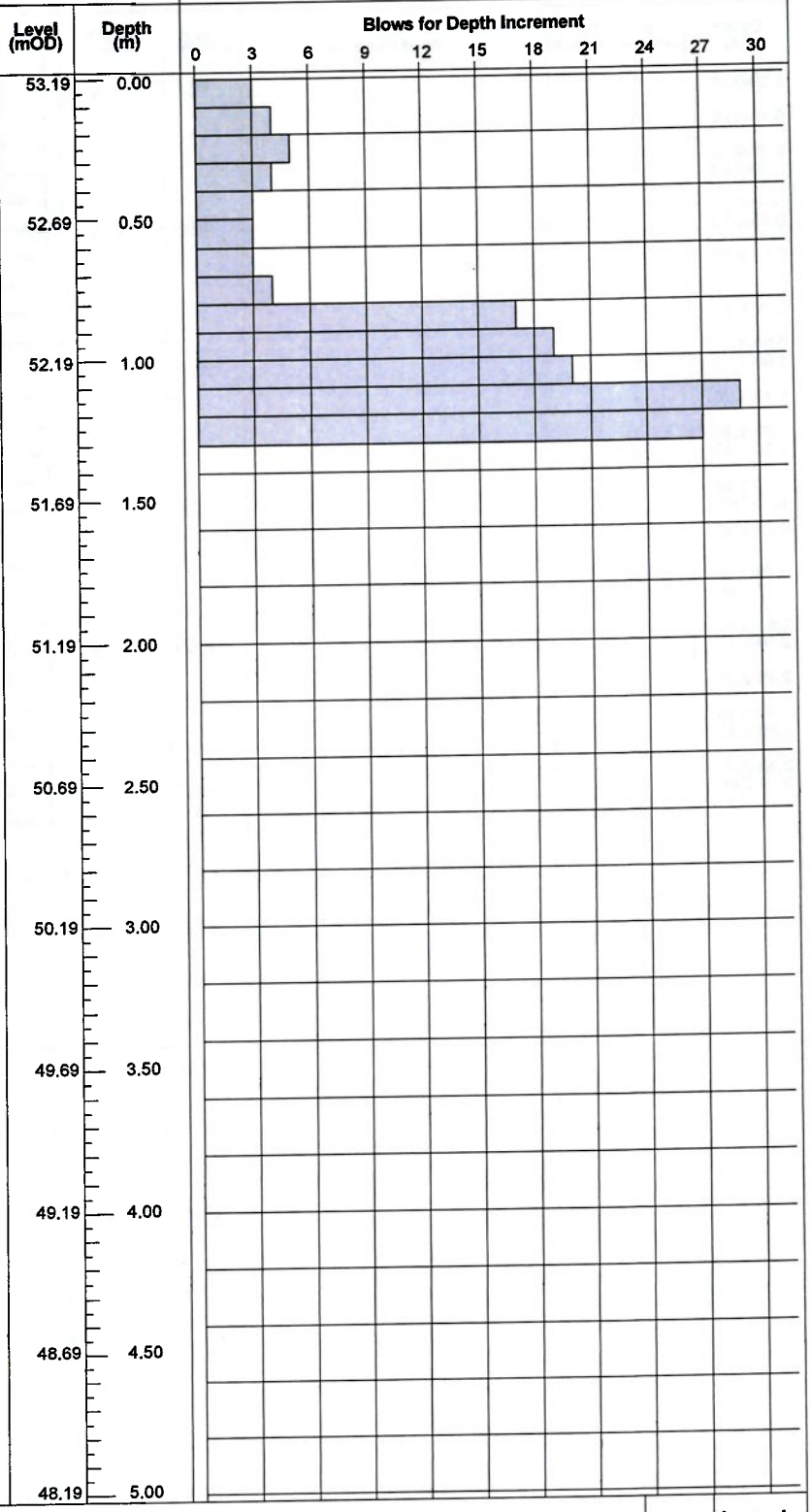
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Site	Probe Number
Coolpowra Galway	DP-38

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	53.19	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582537.3 E 709054.1 N	18/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	4	
0.20-0.30	5	
0.30-0.40	4	
0.40-0.50	3	
0.50-0.60	3	
0.60-0.70	3	
0.70-0.80	4	
0.80-0.90	17	
0.90-1.00	19	
1.00-1.10	20	
1.10-1.20	29	
1.20-1.30	27	



Remarks
Refusal at 1.30m BGL

Scale (approx)	Logged By
1:25	CMP

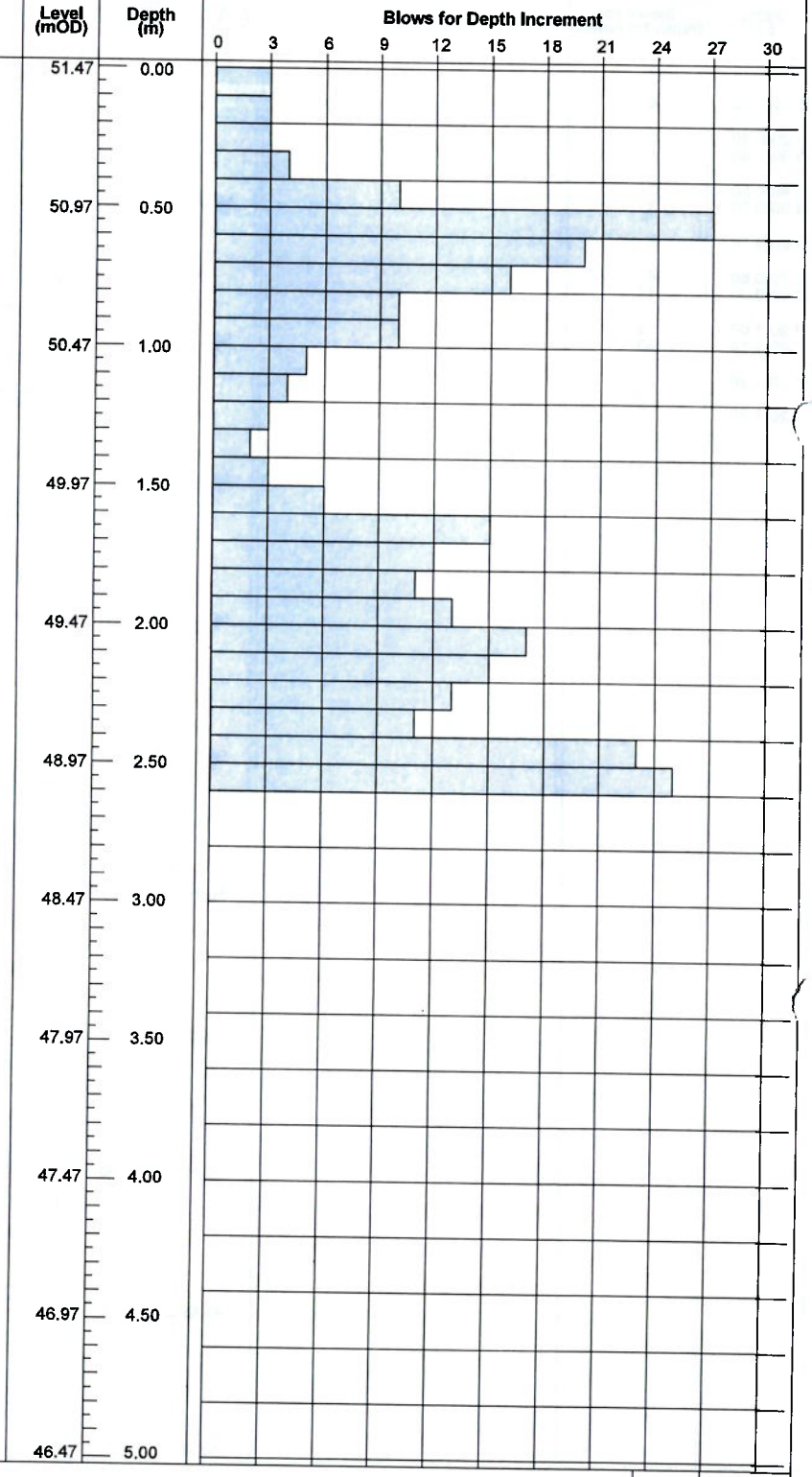
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 51.47	**Site** Coolpowra Galway	**Probe Number** PBT-06
	Location 582169.9 E 709133 N	**Dates** 16/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	3	
0.20-0.30	3	
0.30-0.40	4	
0.40-0.50	10	
0.50-0.60	27	
0.60-0.70	20	
0.70-0.80	16	
0.80-0.90	10	
0.90-1.00	10	
1.00-1.10	5	
1.10-1.20	4	
1.20-1.30	3	
1.30-1.40	2	
1.40-1.50	3	
1.50-1.60	6	
1.60-1.70	15	
1.70-1.80	12	
1.80-1.90	11	
1.90-2.00	13	
2.00-2.10	17	
2.10-2.20	15	
2.20-2.30	13	
2.30-2.40	11	
2.40-2.50	23	
2.50-2.60	25	



Remarks
Refusal at 2.60m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

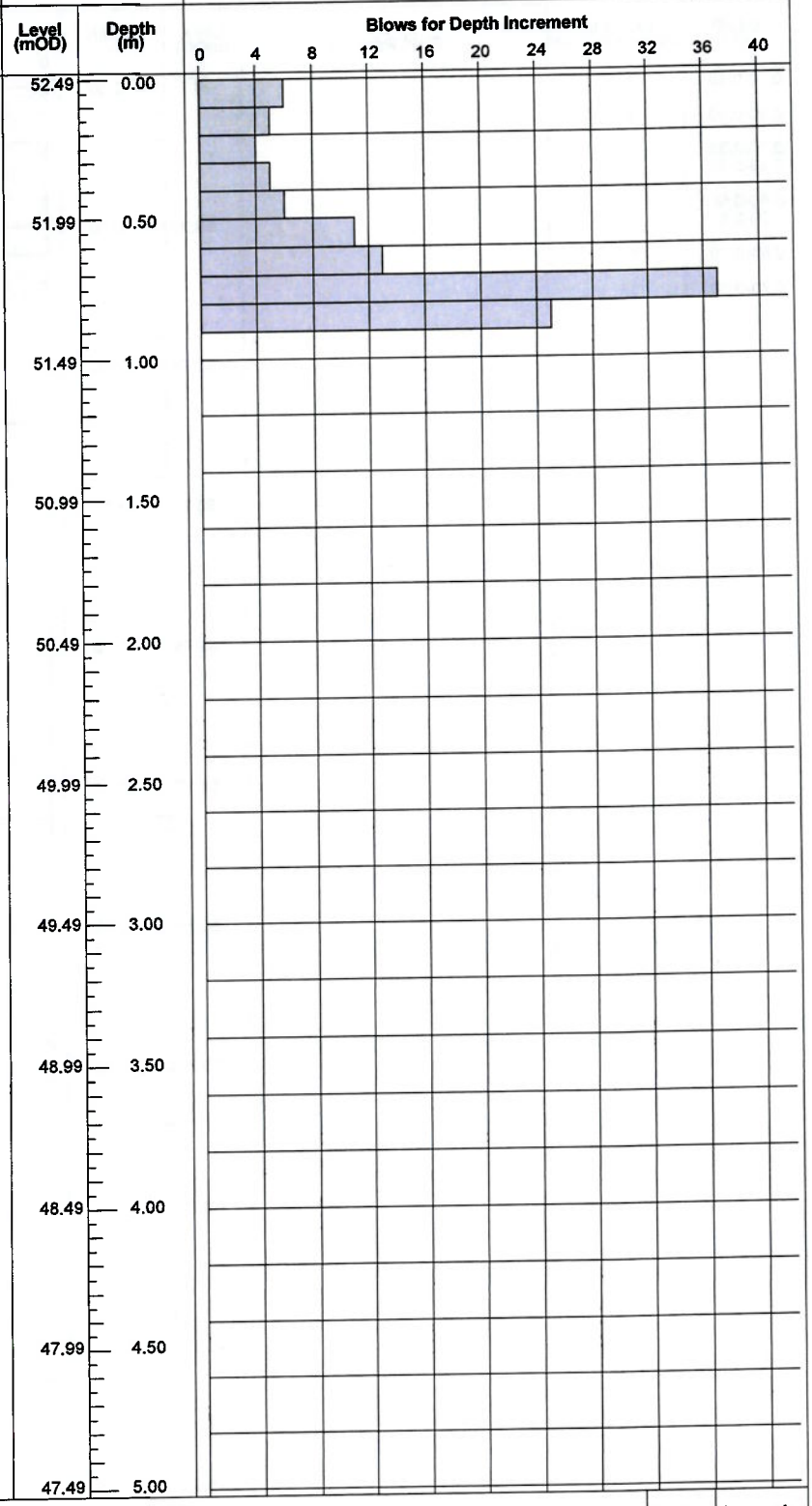
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Site	Probe Number
Coolpowra Galway	PBT-07

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	Diameter 43.70mm, Angle 90°	52.49	Lumcloon Energy	13999-07-24
	Location	**Dates**	**Engineer**	**Sheet**
	582249.5 E 709074.5 N	18/09/2024	Kilgallen & Partners Consulting Engineers	1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	6	
0.10-0.20	5	
0.20-0.30	4	
0.30-0.40	5	
0.40-0.50	6	
0.50-0.60	11	
0.60-0.70	13	
0.70-0.80	37	
0.80-0.90	25	



Remarks
Refusal at 0.90m BGL

Scale (approx)	Logged By
1:25	CMP

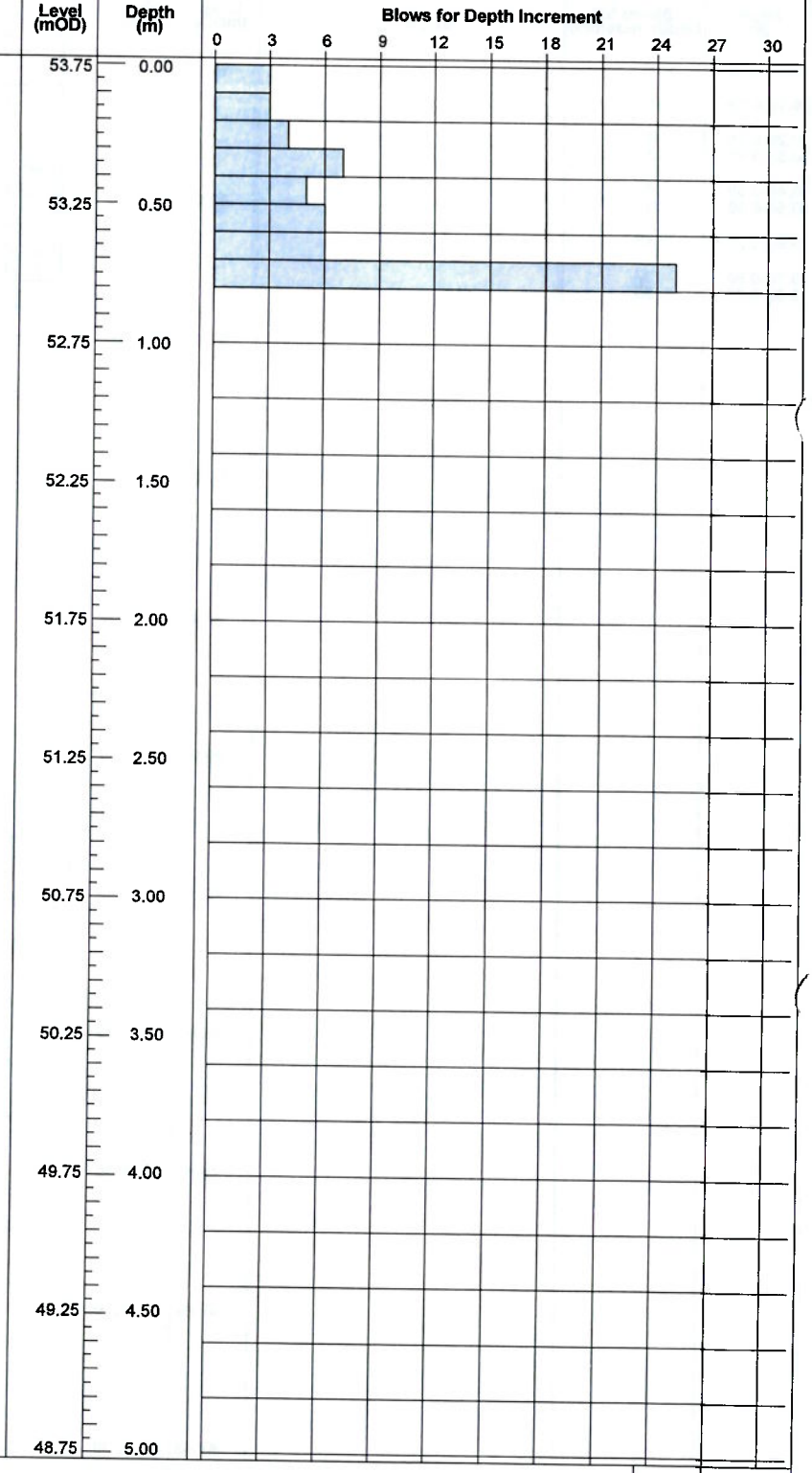
Figure No.
13999-07-24.PBT-06

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Site Coolpowra Galway				**Probe Number** PBT-08
Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 53.75	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582275.6 E 708983.9 N	**Dates** 18/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	3	
0.20-0.30	4	
0.30-0.40	7	
0.40-0.50	5	
0.50-0.60	6	
0.60-0.70	6	
0.70-0.80	25	



Remarks
Refusal at 0.80m BGL

Scale (approx)	Logged By
1:25	CMP

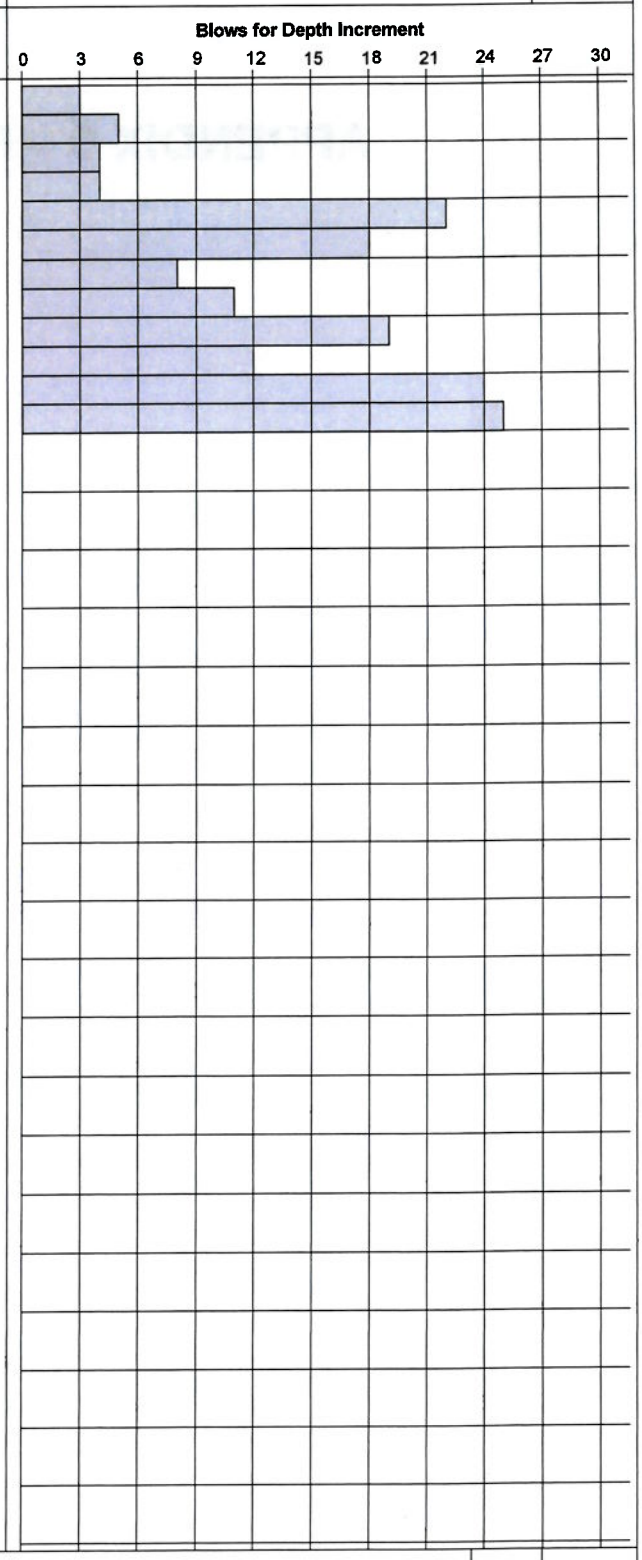
Figure No.
13999-07-24.PBT-06

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Method Dynamic Probe Heavy (DPH), Hammer Drop Height 500mm, Hammer Weight 50Kg	**Cone Dimensions** Diameter 43.70mm, Angle 90°	**Ground Level (mOD)** 53.93	**Site** Coolpowra Galway	**Probe Number** PBT-13
	Location 582469.5 E 709091.3 N	**Dates** 16/09/2024	**Client** Lumcloon Energy	**Job Number** 13999-07-24
			Engineer Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	3	
0.10-0.20	5	
0.20-0.30	4	
0.30-0.40	4	
0.40-0.50	22	
0.50-0.60	18	
0.60-0.70	8	
0.70-0.80	11	
0.80-0.90	19	
0.90-1.00	12	
1.00-1.10	24	
1.10-1.20	25	



Remarks
Refusal at 1.20m BGL

Scale (approx)	Logged By
1:25	CMP

Figure No.
13999-07-24.PBT-06

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APPENDIX 5 – Rotary Core Records



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Site Coolpowra Galway			**Borehole Number** BH01
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.70m	**Ground Level (mOD)** 48.60	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 581992.8 E 709010.4 N	**Dates** 25/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(1.00)	Recovery consists of dark grey slightly sandy gravelly CLAY with low cobble content. Driller notes brown CLAY onto black CLAY			
1.00-1.45	50	9	9		8,10/11,12,7,10 SPT(C) N=40	47.60	1.00	Recovery consists of dark grey slightly sandy gravelly CLAY with low cobble content. Driller notes brown CLAY onto black CLAY (Very Stiff)			
2.00							(1.00)				
2.20				12		46.60	2.00	Medium strong to strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and fossil beds. Fresh to slightly weathered			
2.90	96	34	34					2.00m to 2.90m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, close to very closely spaced, undulating, rough. F2: 70 to 90 degree fractures, closely spaced, undulating, rough.			
3.56-3.70					C			2.90m to 6.70m BGL - One Fracture Set - F1: 0 to 20 degree fractures, close to medium spaced, undulating to planar, rough.			
3.70 3.90-4.12					C						
4.20-4.39	100	100	90	5	C		(4.70)	4.40m to 4.45m BGL - Fault gouge recovered as dark grey slightly gravelly sandy Clay			
								4.75m to 4.80m BGL - Fault gouge recovered as dark grey slightly gravelly sandy Clay			
5.20	100	100	80					5.45m to 5.50m BGL - Fault gouge recovered as dark grey slightly gravelly sandy Clay			
6.70						41.90	6.70	Complete at 6.70m			

Remarks
Borehole complete at 6.70m BGL
50mm slotted standpipe with pea gravel surround installed from 6.70m to 2.00m BGL. 50mm plain standpipe with a bentonite seal installed from 2.00m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 10.70m **Location** 582118.3 E 709187.8 N	**Ground Level (mOD)** 50.68 **Dates** 01/10/2024	**Site** Coolpowra Galway **Client** Lumcloon Energy **Engineer** Kilgallen & Partners Consulting Engineers	**Borehole Number** BH02 **Job Number** 13999-07-24 **Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	30						(1.00)	Recovery consists of dark brown slightly gravelly sandy Clay. Driller notes Clay onto Gravel			
1.00 1.00-1.45	35				8,7/9,13,13,15 SPT(C) N=50	49.68	1.00	Recovery consists of Cobbles of Limestone with some dark grey gravelly Clay. Driller notes Cobbles with grey silt washback (Very stiff/ Dense)			
2.00 2.00-2.28	20				10,10/16,25 SPT(C) 41/130		(4.30)				
3.50 3.50-3.95	13				4,6/9,14,27 SPT(C) N=50						
5.00 5.00-5.20 5.30					18,25/50 SPT(C) 50/50	45.38	5.30	Strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE. Fresh to slightly weathered 5.30m to 6.50m BGL - One Fracture Set - F1: 0 to 20 degree fractures, medium to closely spaced, undulating, rough.			
5.72-5.90	93	76	60		C		(1.20)				
6.30-6.50					C						
6.50				8		44.18	6.50	Medium strong to strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and fossil beds. Fresh to slightly weathered 6.50m to 7.80m BGL - One Fracture Set - F1: 0 to 20 degree fractures, close to very closely spaced, undulating to planar, rough.			
7.45-7.55	100	100	60		C						
7.80								7.80m to 10.70m BGL - One Fracture Set - F1: 0 to 20 degree fractures, wide to medium spaced, undulating, rough.			
8.00							(4.20)				
	100	100	87	3							
9.50											

Remarks
Borehole complete at 10.70m BGL
50mm slotted standpipe with pea gravel surround installed from 10.70m to 2.00m BGL. 50mm plain standpipe with a bentonite seal installed from 2.00m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No.
13999-07-24.BH01

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Site Coolpowra Galway				**Borehole Number** BH02
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 10.70m	**Ground Level (mOD)** 50.68	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582118.3 E 709187.8 N	**Dates** 01/10/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	100	100	79								
10.70						39.98	10.70	Complete at 10.70m			

Remarks

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Site Coolpowra Galway			**Borehole Number** BH03
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.70m	**Ground Level (mOD)** 51.88	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582182.9 E 708932.1 N	**Dates** 25/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(1.00)	Recovery consists of greyish brown slightly sandy gravelly Clay. Driller notes brown CLAY.			
1.00-1.45	50				5,6/5,4,7,5 SPT(C) N=21	50.88	1.00				
							(1.00)	Recovery consists of dark grey subangular to subrounded Gravel with low cobble content and low boulder content. Driller notes brown CLAY (Stiff)			
2.00						49.88	2.00				
2.20				NI				Medium strong to strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and occasional fossils. Fresh to slightly weathered			
2.52-2.66					C						
2.60								2.00m to 2.30m BGL - Not Intact			
2.97-3.05	100	80	43		C			2.30m to 2.60m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, very closely spaced, undulating to planar, rough. F2: 50 to 70 degree fractures, very closely spaced, undulating, rough.			
3.40-3.55					C						
3.70								2.60m to 6.70m BGL - Three Fracture Sets - F1: 0 to 20 degree fractures, close to medium spaced, undulating, rough. F2: 40 to 60 degree fractures, close to medum spaced, undulating, rough. F3: 70 to 90 degree fractures, widely spaced, undulating, rough.			
	90	90	70	6			(4.70)				
5.20											
	100	100	70								
6.70						45.18	6.70	Complete at 6.70m			

Remarks
Borehole complete at 6.70m BGL
50mm slotted standpipe with pea gravel surround installed from 6.70m to 2.00m BGL. 50mm plain standpipe with a bentonite seal installed from 2.00m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Site Coolpowra Galway			**Borehole Number** BH04
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.70m	**Ground Level (mOD)** 52.23	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582312.6 E 709081.9 N	**Dates** 25/09/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(1.00)	Recovery consists of brown slightly sandy slightly gravelly Clay. Driller notes brown CLAY			
1.00-1.45	60	9	5		6,67/5,8,8,7 SPT(C) N=28	51.23	1.00				
							(1.00)	Recovery consists of dark grey slightly sandy slightly gravelly Clay with low cobble content. Driller notes Brown CLAY (Stiff to Very Stiff)			
2.00						50.23	2.00				
2.20 2.35-2.48					C			Medium strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and occasional fossils. Fresh to slightly weathered 2.00m to 3.70m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, close to very closely spaced, undulating to planar, rough. F2: 50 to 70 degree fractures, medium spaced, undulating, rough.			
2.75-2.86	100	100	19	15	C						
3.70											
4.25-4.45	89	89	56		C		(4.70)	3.70m to 6.70m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, medium spaced, undulating, rough. F2: 40 to 60 degree fractures, medum to widely spaced, undulating, rough.			
5.20	100	100	73	3							
6.70						45.53	6.70	Complete at 6.70m			

Remarks
Borehole complete at 6.70m BGL
50mm slotted standpipe with pea gravel surround installed from 6.70m to 2.00m BGL. 50mm plain standpipe with a bentonite seal installed from 2.00m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Site Coolpowra Galway			**Borehole Number** BH05
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.50m **Location** 582335.2 E 709006 N	**Ground Level (mOD)** 53.27 **Dates** 01/10/2024	**Client** Lumcloon Energy **Engineer** Kilgallen & Partners Consulting Engineers	**Job Number** 13999-07-24 **Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	55					53.17	0.10	TOPSOIL Recovery consists of brown slightly sandy slightly gravelly Clay. Driller notes CLAY.			
1.00 1.00-1.42	50				5,7/9,11,12,18 SPT(C) 50/270	52.07	(1.10) 1.20	Recovery consists of dark grey slightly clayey slightly sandy subanguar to subrounded Gravel with low cobble content. Driller notes grey Gravel and Cobbles (Dense)			
2.00 2.00-2.45 2.20-2.47	100	80	67		25/50 SPT(C) N=50 C	51.27	(0.80) 2.00	Medium strong to strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and occasional fossils. Fresh to slightly weathered 2.00m to 2.80m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, close to medium spaced, undulating, rough. F2: 70 to 90 degree fractures, widely spaced undulating rough			
3.45-3.57 3.50					C						
4.10-4.30	96	93	83	5	C		(4.50)				
5.00	100	100	76					2.80m to 6.50m BGL - Three Fracture Sets - F1: 0 to 20 degree fractures, medium spaced, undulating to planar, rough. F2: 40 to 60 degree fractures, widely spaced undulating rough. F3: 70 to 90 degree fracturees, widely spaced, undulating to stepped, rough.			
6.50						46.77	6.50	Complete at 6.50m			

Remarks
Borehole complete at 6.50m BGL
50mm slotted standpipe with pea gravel surround installed from 6.50m to 2.50m BGL. 50mm plain standpipe with a bentonite seal installed from 2.50m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Site Coolpowra Galway			**Borehole Number** BH06
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.50m	**Ground Level (mOD)** 54.37	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582389.1 E 709293.9 N	**Dates** 02/10/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	80					54.27	0.10	TOPSOIL			
							(0.90)	Recovery consists of brown slightly sandy slightly gravelly Clay. Driller notes brown CLAY			
1.00						53.37	1.00				
1.00-1.10	75				25/50 SPT(C) 25*/100 50/0		(1.00)	Recovery consists of dark grey clayey sandy subanguar to subrounded Gravel with low cobble content and low boulder content. Driller notes Possible Weathered Bedrock			
2.00						52.37	2.00				
2.60-2.85	93	93	67		C			Medium strong massive dark grey fine grained argillaceous LIMESTONE with calcite veins and fossil beds. Fresh to slightly weathered 2.00m to 3.85m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, close to medium spaced, undulating, rough. F2: 40 to 60 degree fractures, medium spaced undulating rough			
2.90-2.98				6	C						
3.11-3.20					C						
3.50											
3.85	100	100	50				(4.50)	3.85m to 6.50m BGL - Two Fracture Sets - F1: 0 to 20 degree fractures, medium spaced, undulating to planar, rough. F2: 40 to 60 degree fractures, widely spaced, undulating rough.			
5.00											
	100	100	80	4							
6.50						47.87	6.50	Complete at 6.50m			

Remarks
Borehole complete at 6.50m BGL
50mm slotted standpipe with pea gravel surround installed from 6.50m to 2.00m BGL. 50mm plain standpipe with a bentonite seal installed from 2.00m to GL with a raised cover.

Scale (approx)	Logged By
1:50	JK

Figure No. 13999-07-24.BH01

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Site Coolpowra Galway				**Borehole Number** BH07
Machine : Beretta T-44 **Flush :** Water **Core Dia:** 63.5 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 6.50m	**Ground Level (mOD)** 52.55	**Client** Lumcloon Energy	**Job Number** 13999-07-24
	Location 582504.3 E 709210 N	**Dates** 01/10/2024	**Engineer** Kilgallen & Partners Consulting Engineers	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	60					52.45	0.10 (0.90)	TOPSOIL Recovery consists of brown slightly sandy slightly gravelly Clay onto light brown slightly gravelly clayey Sand. Driller notes CLAY onto SAND.		
1.00 1.00-1.25	55				4,5/5,45 SPT(C) 50/100	51.55	1.00 (1.50)	Recovery consists of dark grey slightly clayey slightly sandy subanguar to subrounded Gravel. Driller notes GRAVEL with Cobbles. (Dense)		
2.00 2.00-2.35					6,6/12,10,28 SPT(C) 50/200					
2.45-2.70	93	80	30		C	50.05	2.50	Medium strong thinly to medium bedded dark grey fine grained argillaceous LIMESTONE with calcite veins and occassional fossils. Fresh to slightly weathered		
2.95-3.02					C					
3.50 4.15-4.35	100	100	76	7	C		(4.00)	2.50m to 6.50m BGL - Three Fracture Sets - F1: 0 to 20 degree fractures, widely spaced, undulating, rough. F2: 30 to 50 degree fractures, medium to widely spaced undulating rough. F3: 70 to 90 degree fractures, widely spaced, undulating, rough.		
5.00	100	100	76							
6.50						46.05	6.50	Complete at 6.50m		

Remarks
Borehole complete at 6.50m BGL

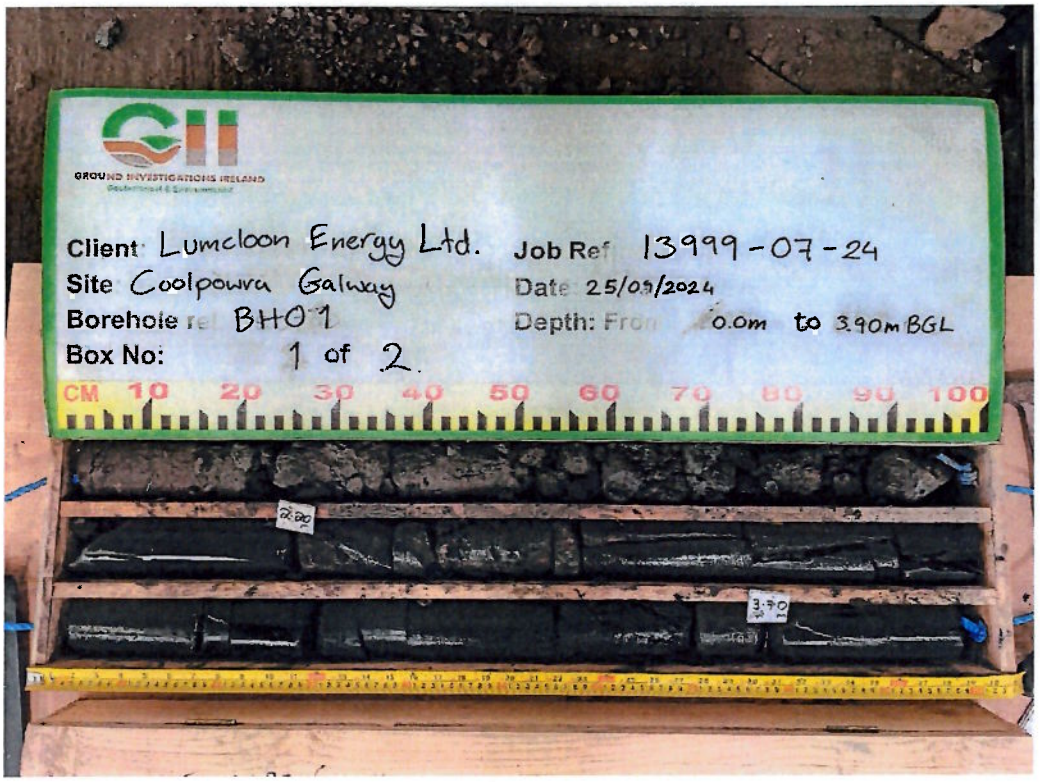
Scale (approx)	Logged By
1:50	JK

Figure No.
13999-07-24.BH01

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Coolpowra Galway - Rotary Core Photographs

BH01

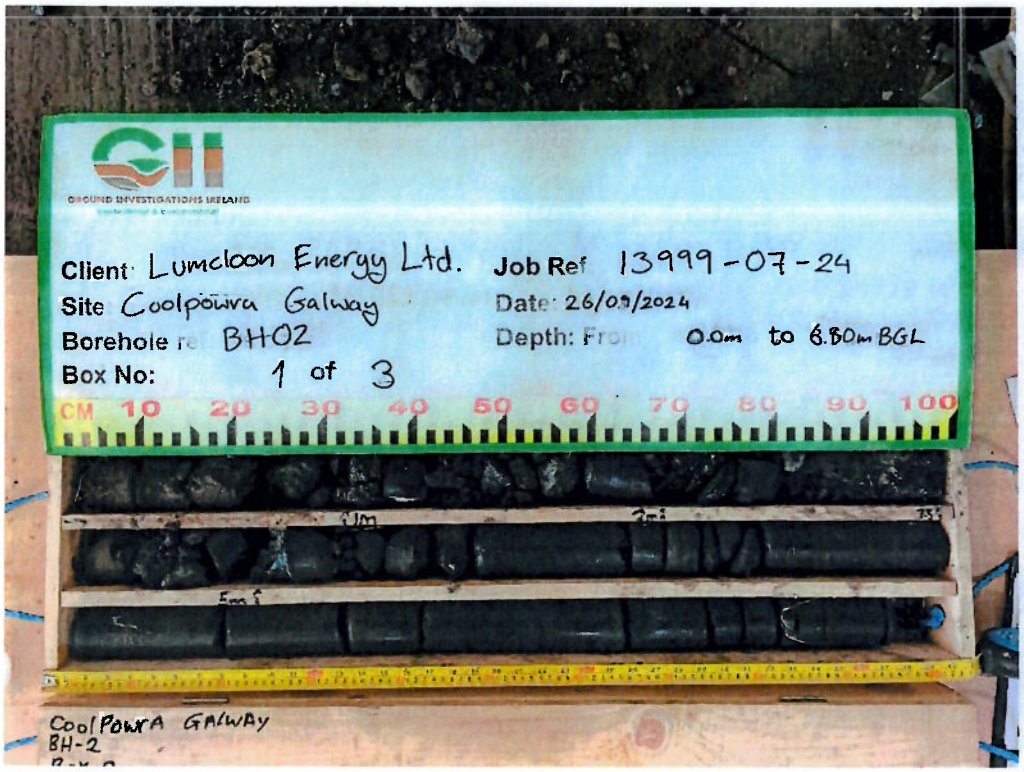


BH01

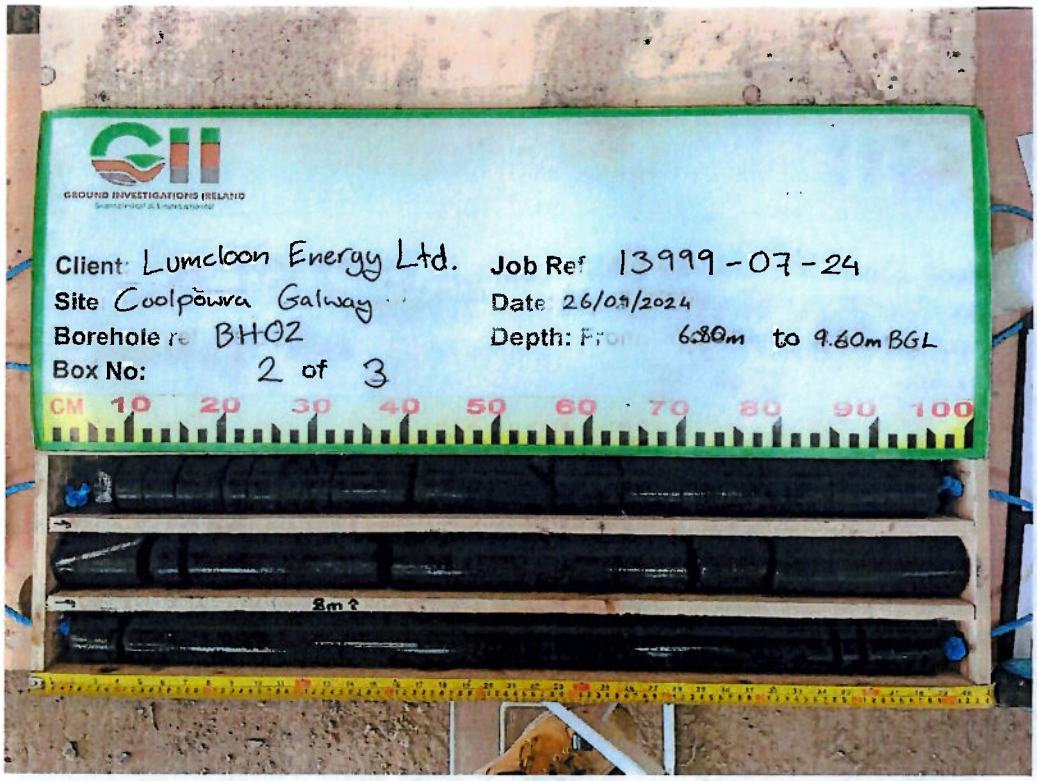


Coolpowra Galway - Rotary Core Photographs

BH02

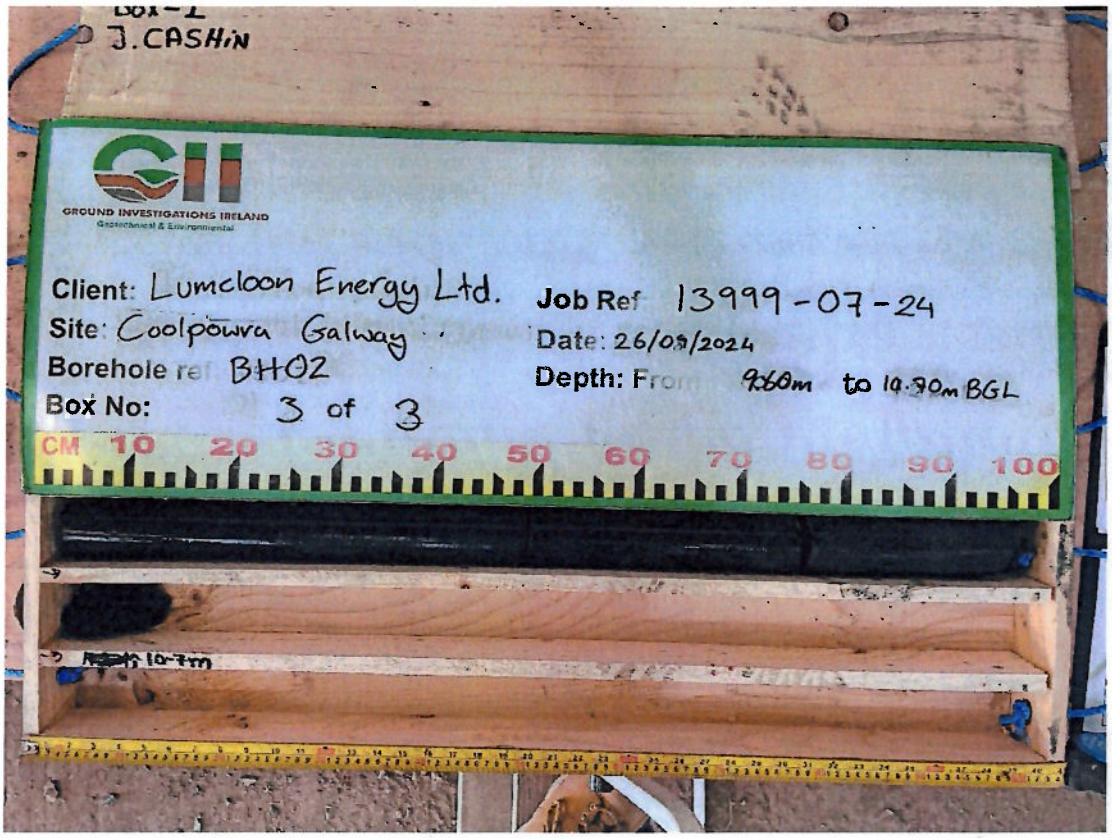


BH02



Coolpowra Galway - Rotary Core Photographs

BH02



Coolpowra Galway - Rotary Core Photographs

BH03

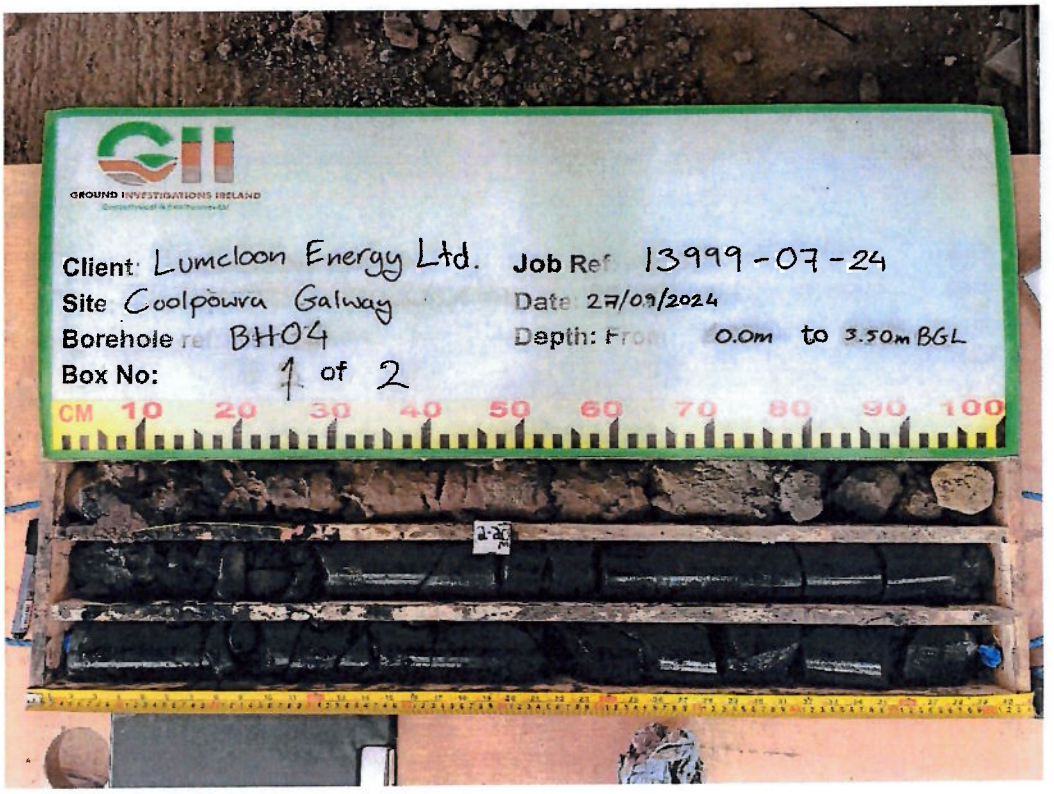


BH03



Coolpowra Galway - Rotary Core Photographs

BH04

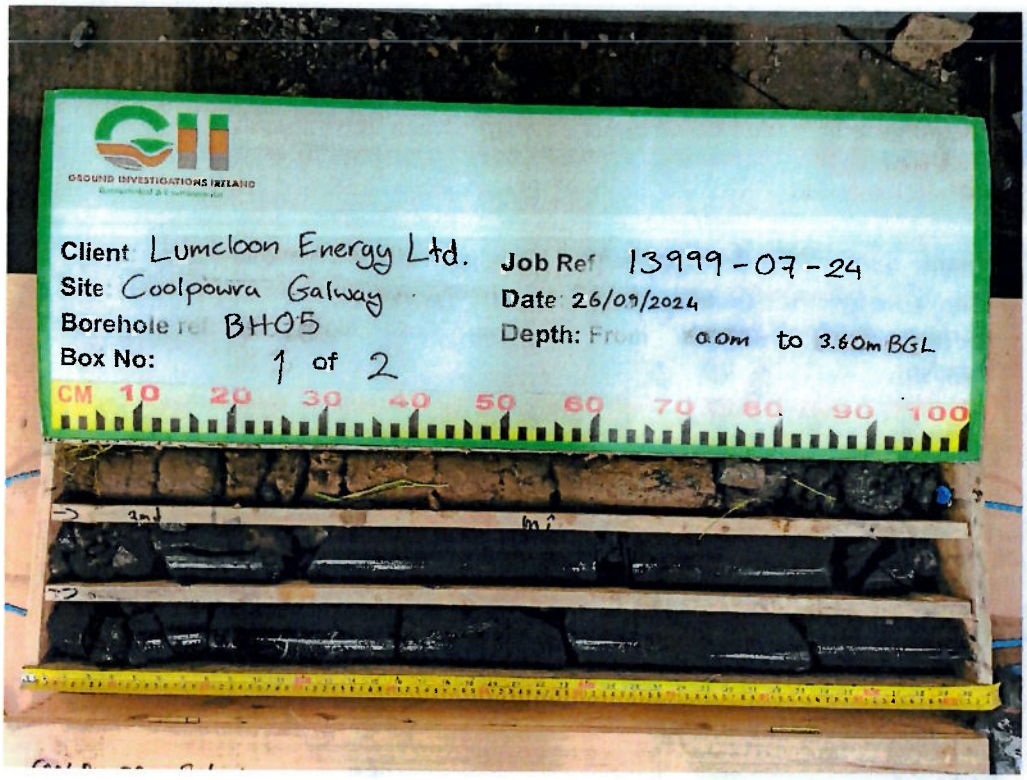


BH04



Coolpowra Galway - Rotary Core Photographs

BH05

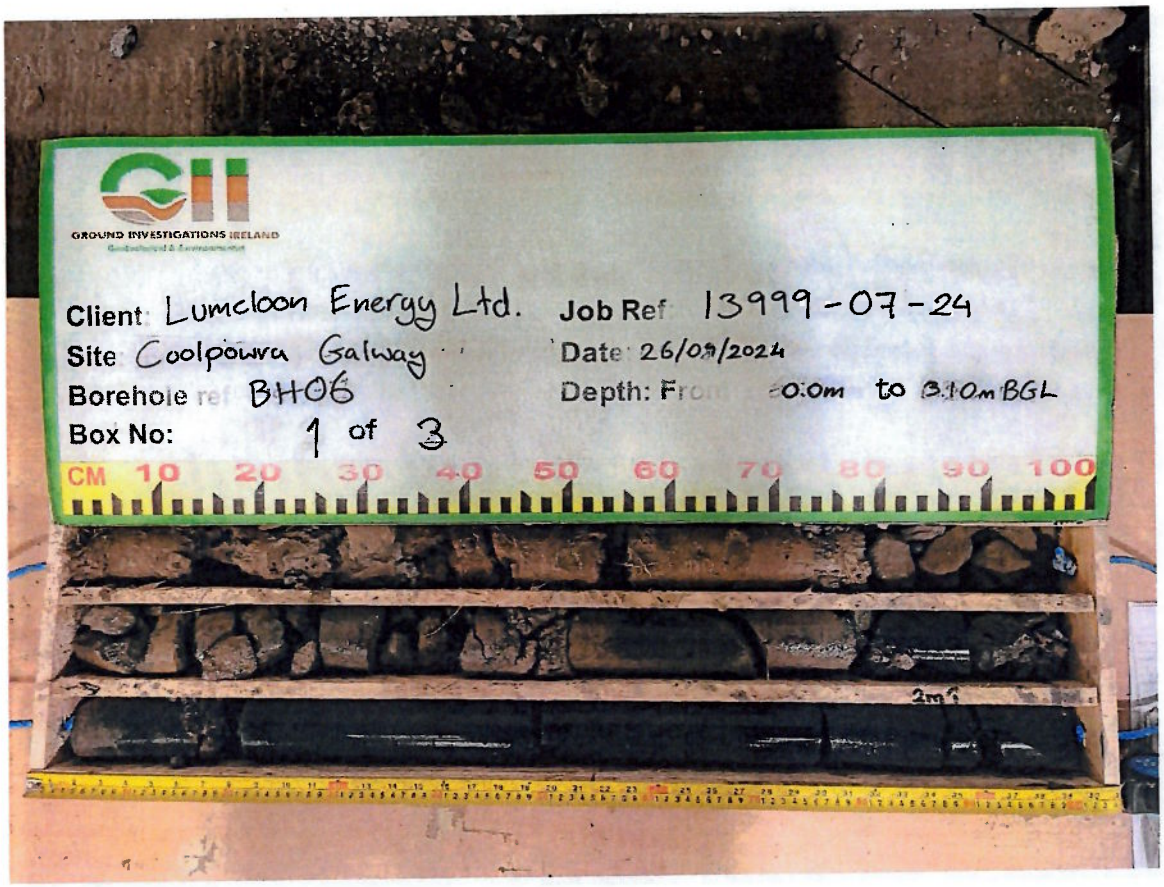


BH05

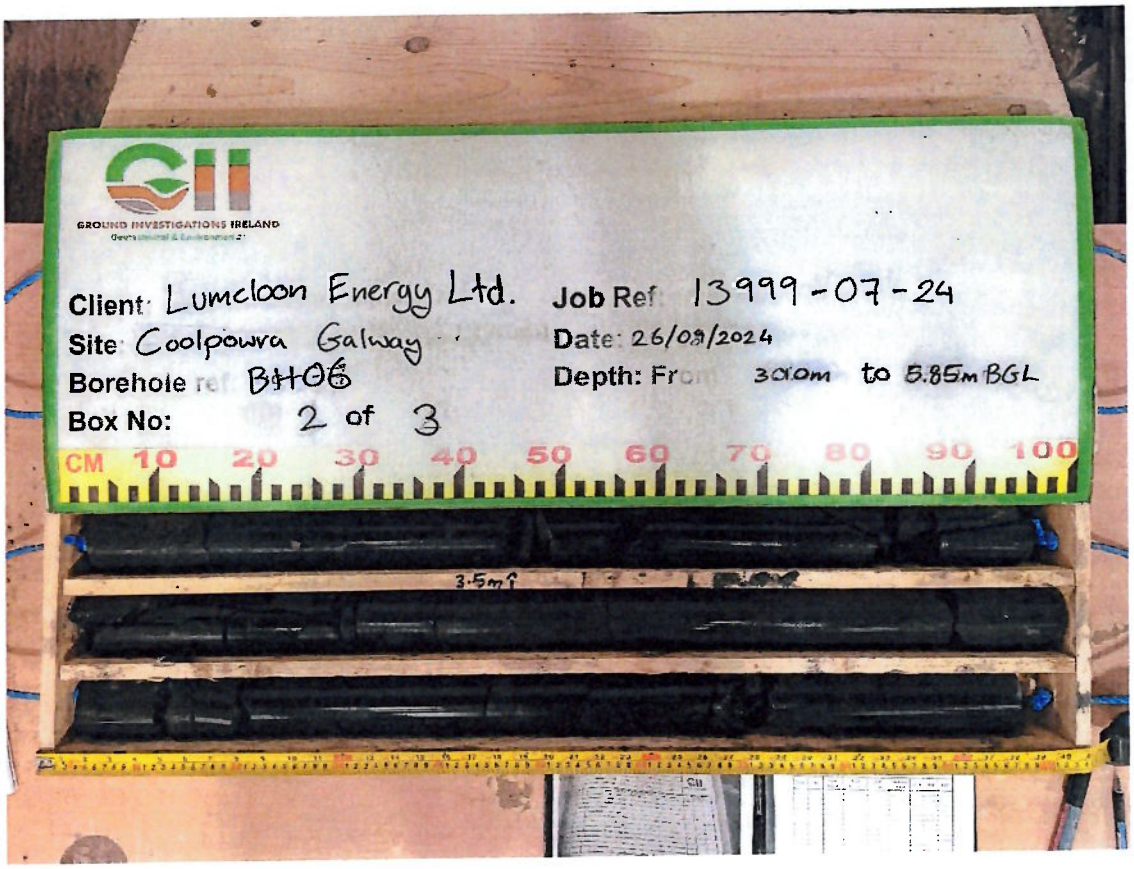


Coolpowra Galway - Rotary Core Photographs

BH06



BH06



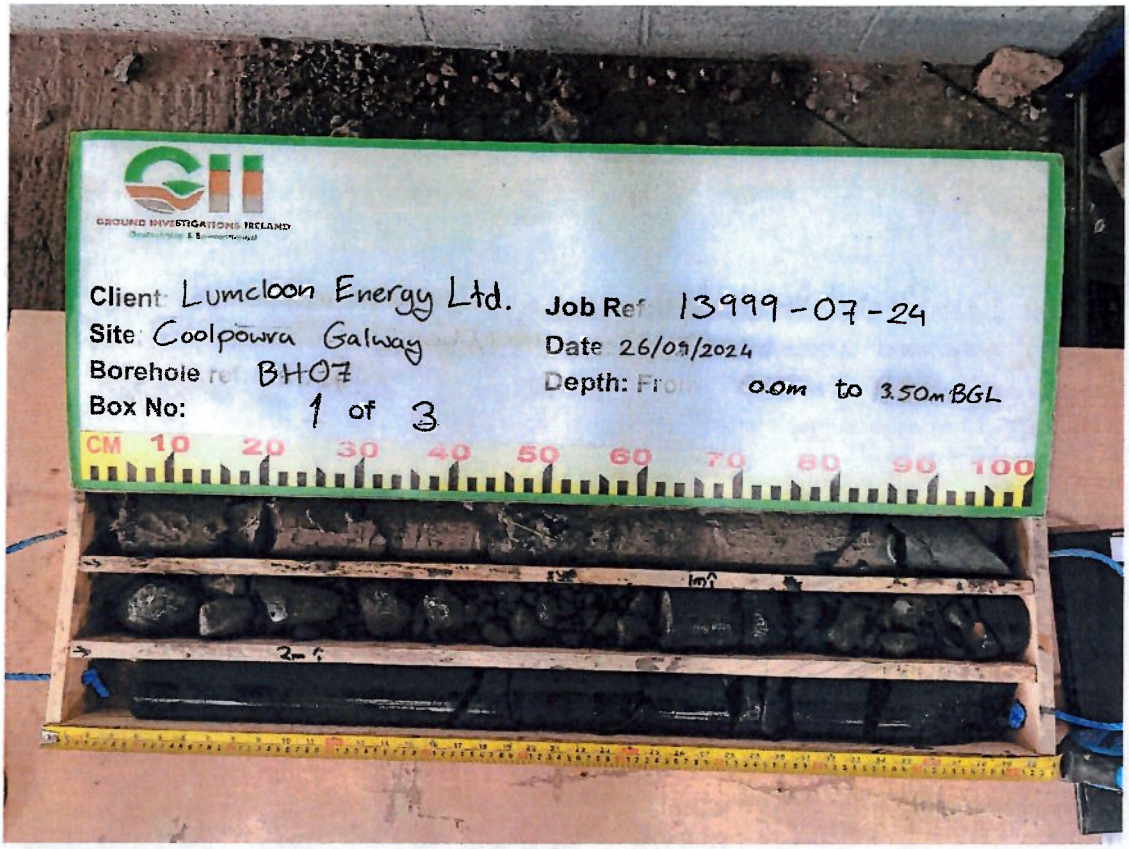
Coolpowra Galway - Rotary Core Photographs

BH06



Coolpowra Galway - Rotary Core Photographs

BH07

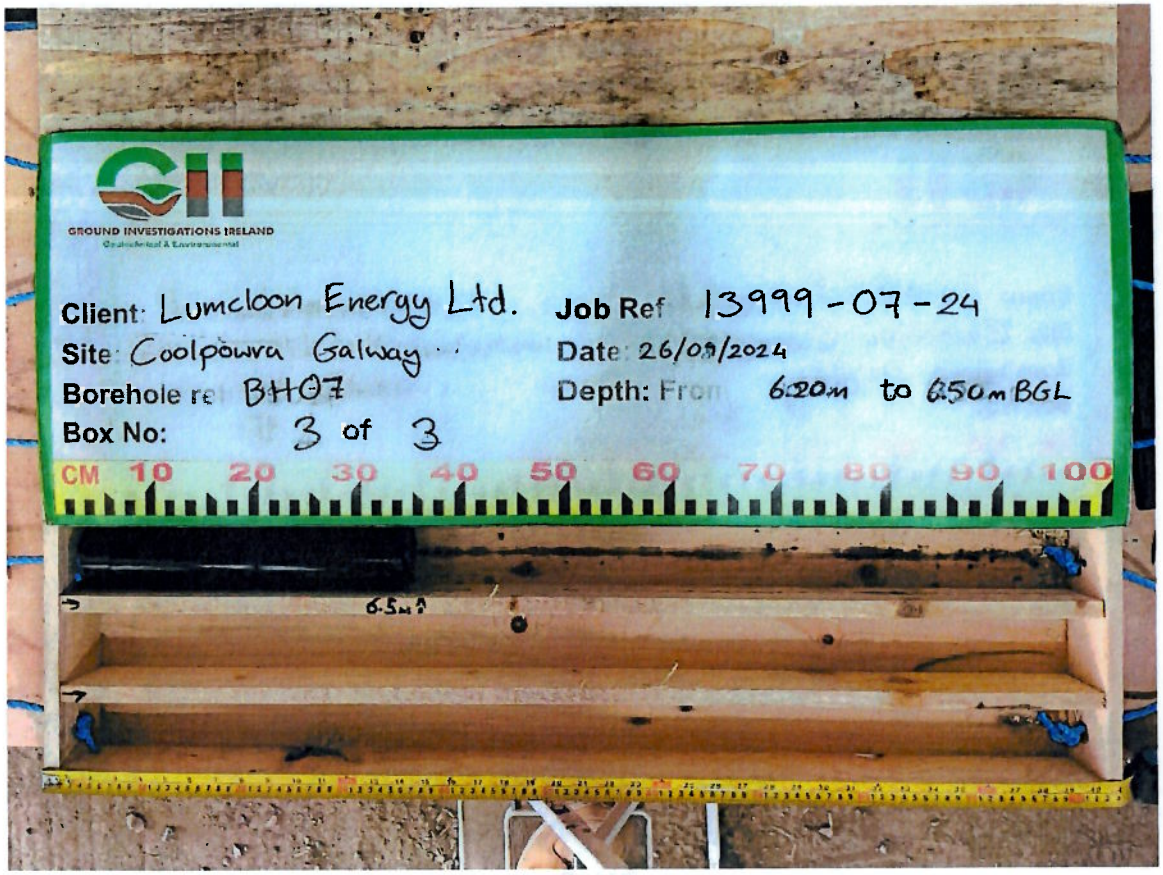


BH07



Coolpowra Galway - Rotary Core Photographs

BH07



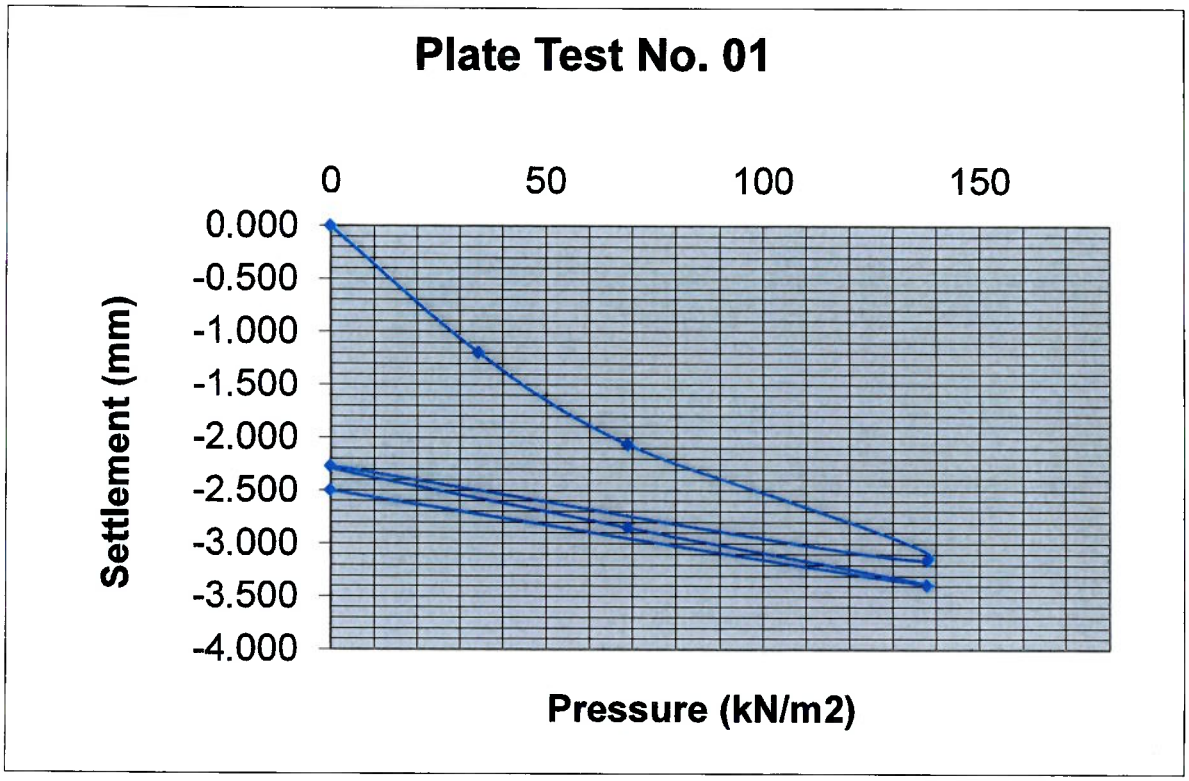
APPENDIX 6 – Plate Test Records



Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-1.1955
69	-2.065
138	-3.153
0	-2.27
69	-2.851
138	-3.3885
0	-2.5015

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-01	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **22.58 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **80.25 MN/m2/m**

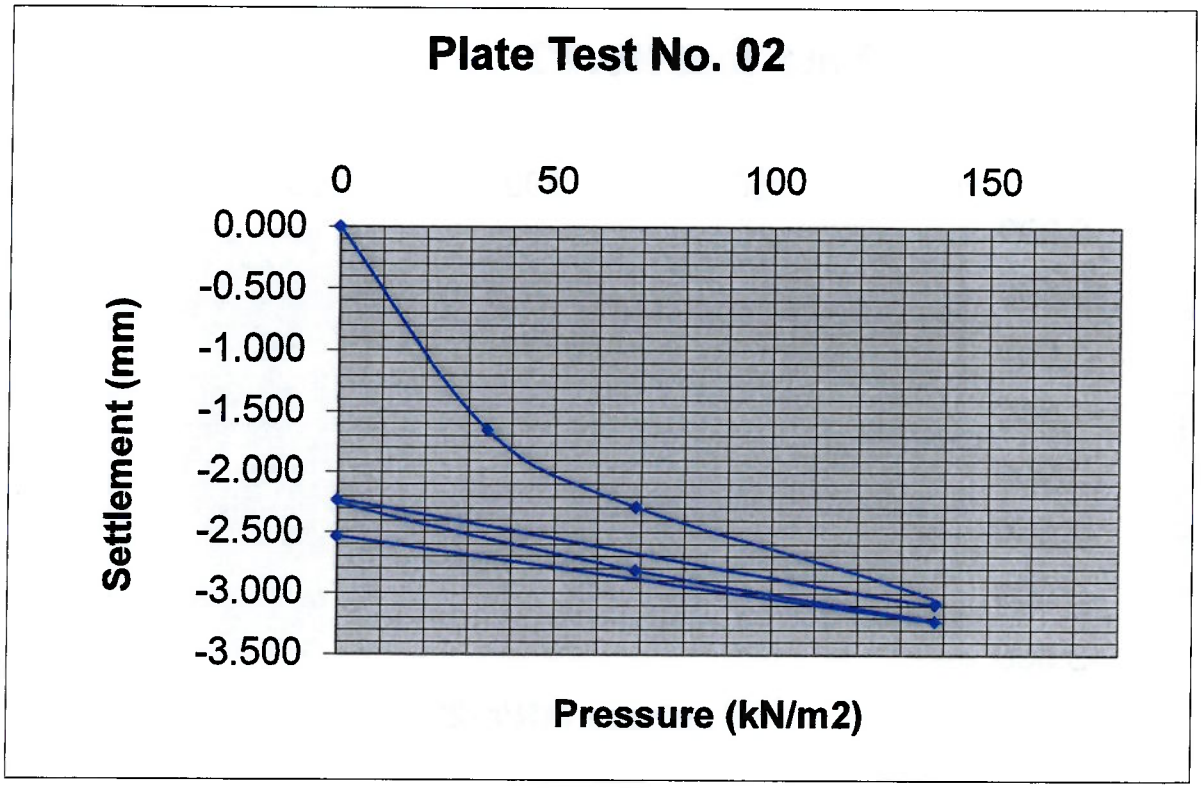
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **2.14 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **19.26 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-1.6555
69	-2.2895
138	-3.0905
0	-2.2335
69	-2.8175
138	-3.231
0	-2.536

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-02	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **20.36 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **79.83 MN/m2/m**

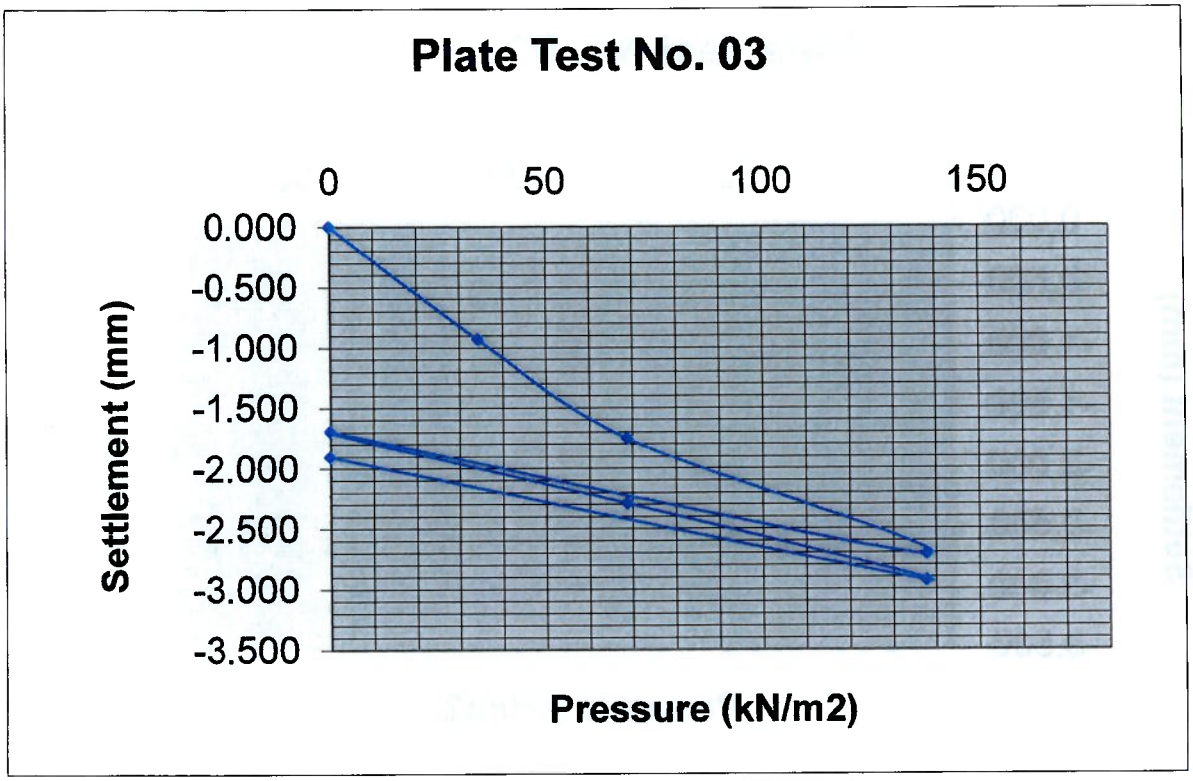
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.79 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **19.09 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-0.933
69	-1.7545
138	-2.712
0	-1.6945
69	-2.2925
138	-2.93
0	-1.905

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-03	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **26.57 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **77.97 MN/m2/m**

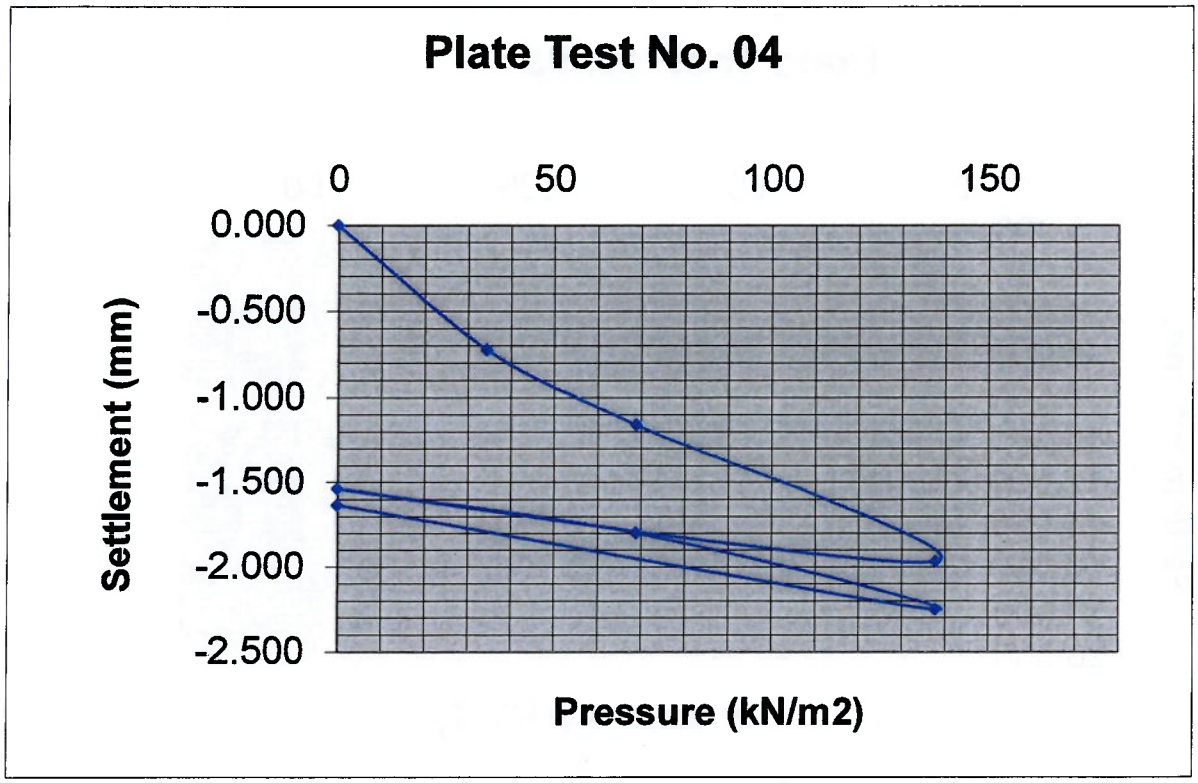
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **2.84 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **18.32 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-0.724
69	-1.158
138	-1.9675
0	-1.54
69	-1.797
138	-2.253
0	-1.6335

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-04	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **40.26 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **181.41 MN/m2/m**

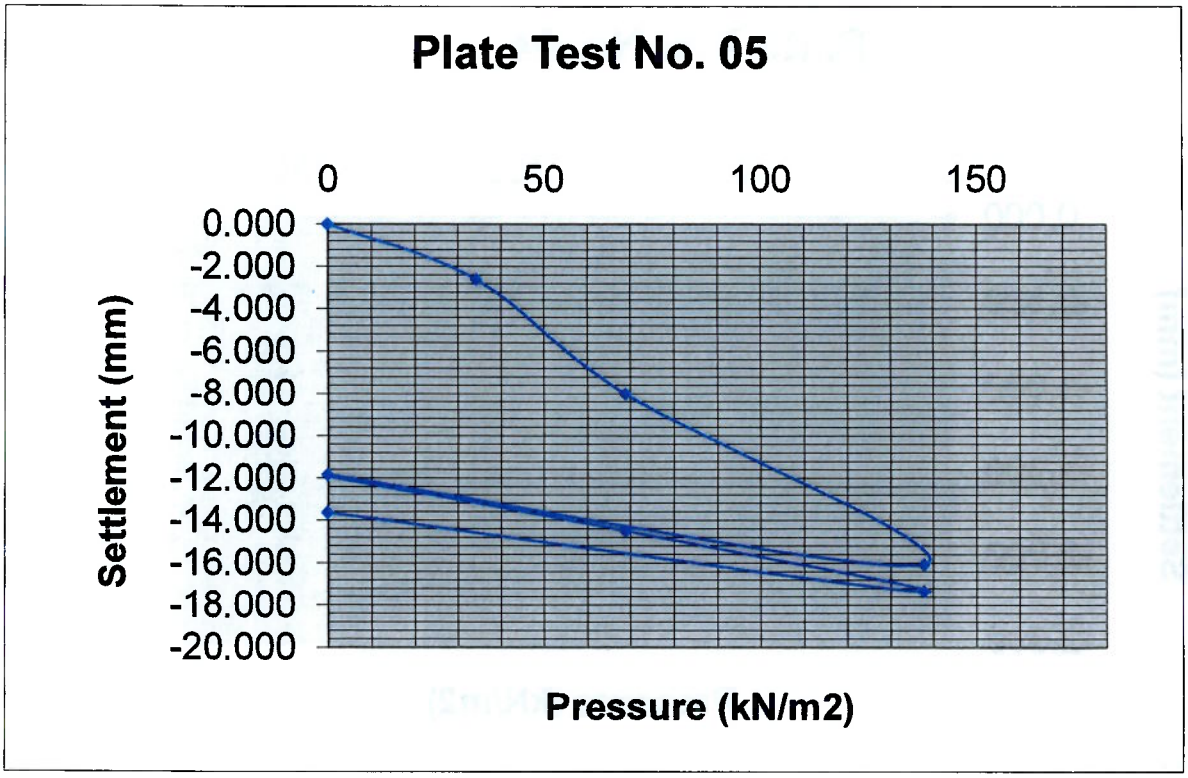
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **5.83 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **79.18 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-2.624
69	-8.0375
138	-16.0805
0	-11.8345
69	-14.506
138	-17.377
0	-13.656

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Soft brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-05	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **5.80 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **17.45 MN/m2/m**

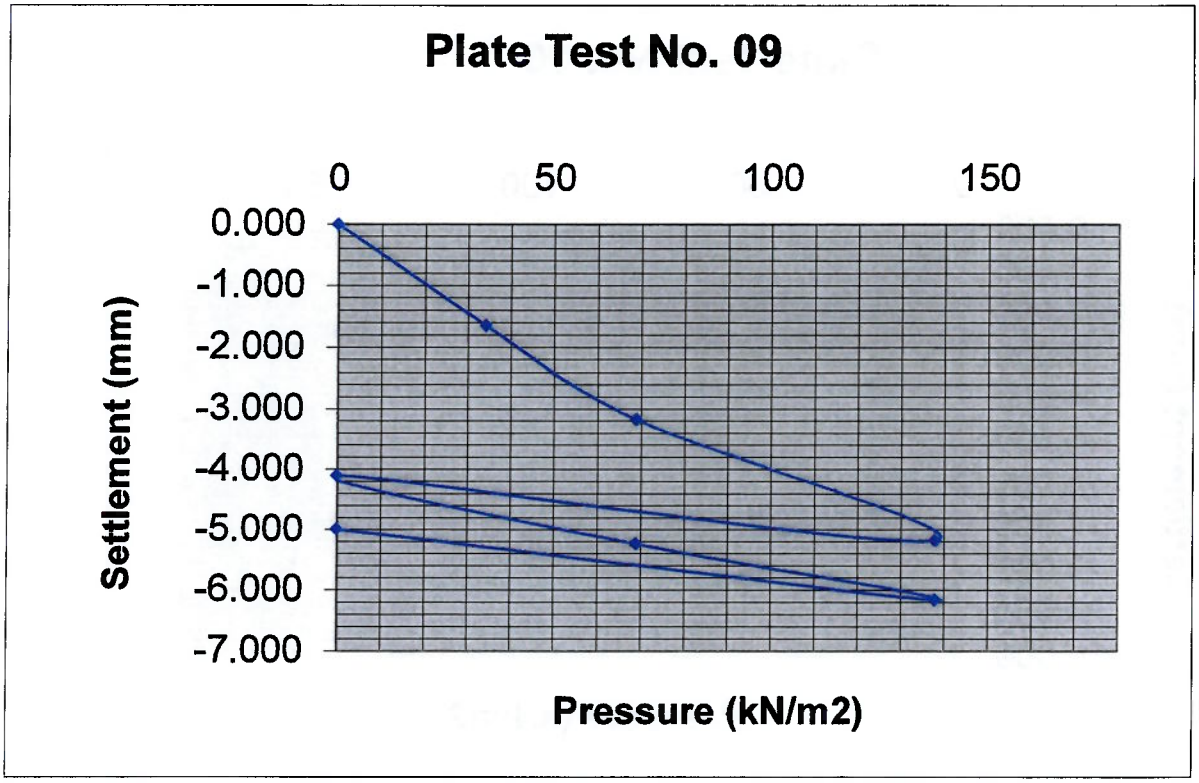
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **0.20 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **1.37 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-1.651
69	-3.174
138	-5.1805
0	-4.1
69	-5.237
138	-6.1625
0	-4.9895

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-09	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **14.69 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **41.01 MN/m2/m**

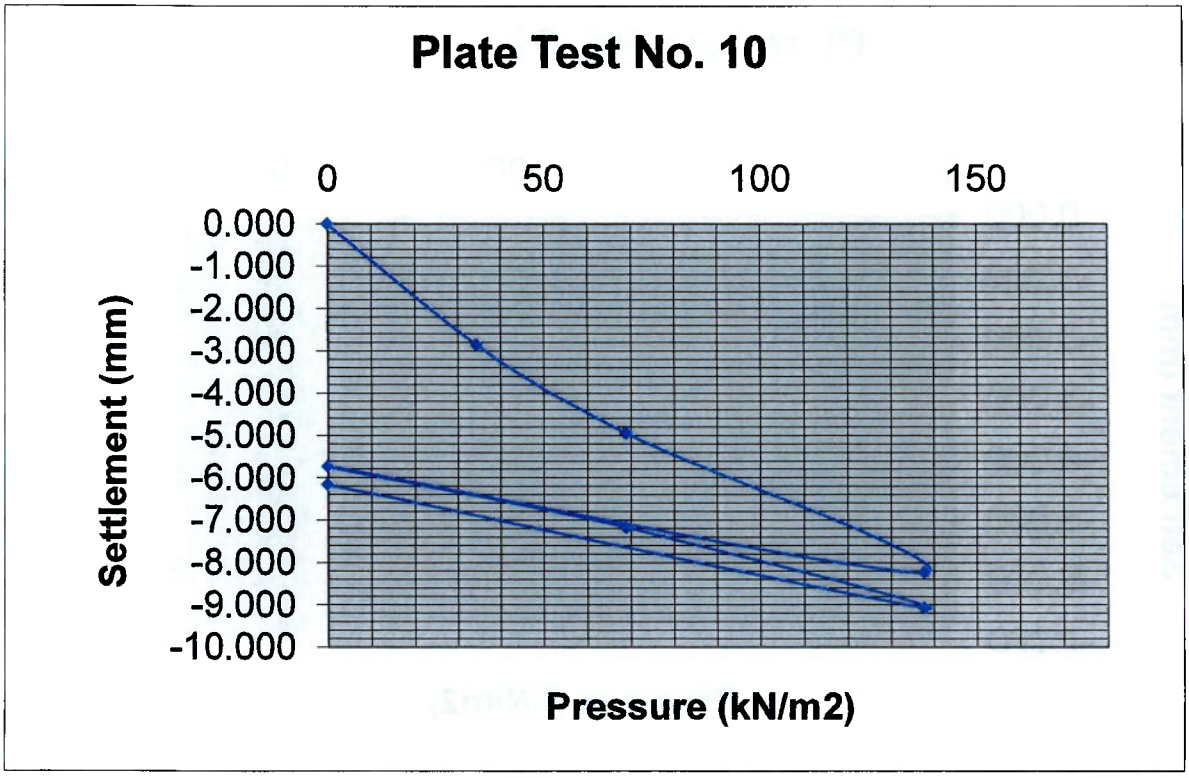
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.02 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **6.02 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-2.859
69	-4.9505
138	-8.235
0	-5.7295
69	-7.1745
138	-9.0785
0	-6.1695

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY with low cobble and boulder content
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-10	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **9.42 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **32.27 MN/m2/m**

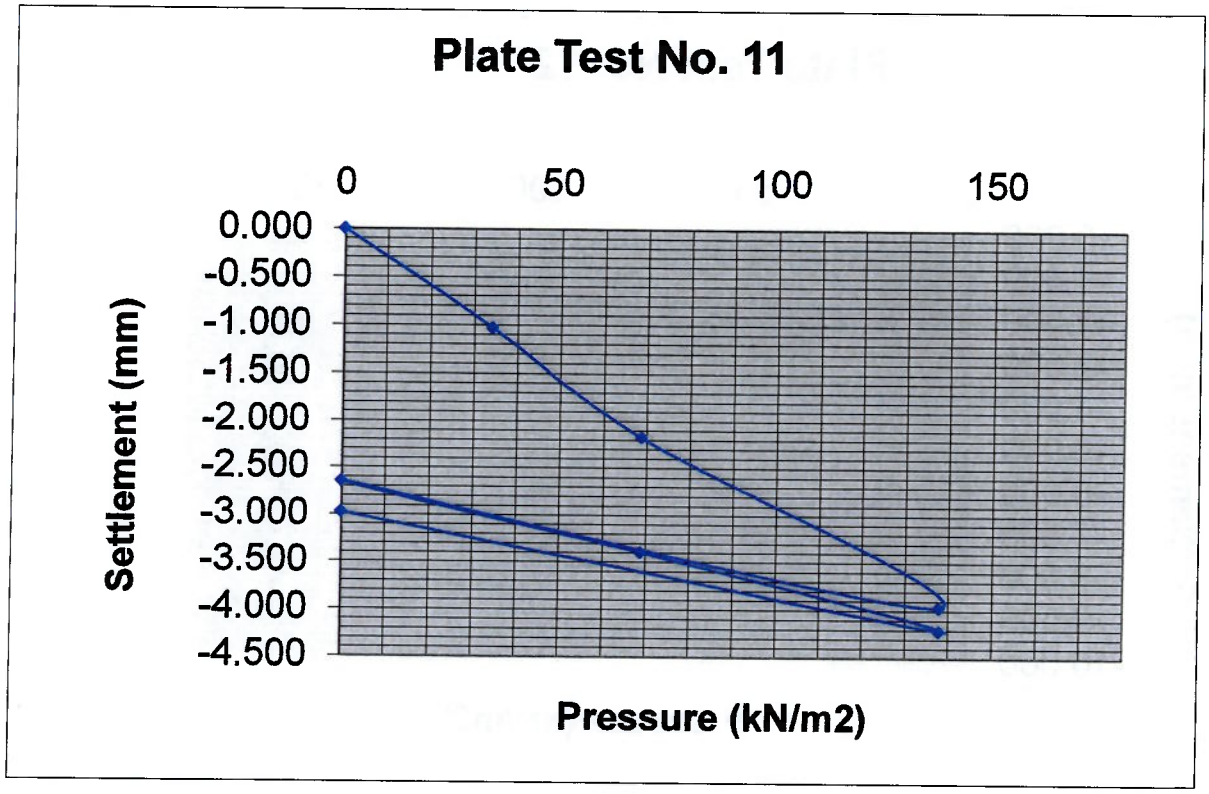
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **0.47 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **3.97 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-1.0325
69	-2.175
138	-3.9655
0	-2.644
69	-3.3975
138	-4.216
0	-2.9735

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy slightly gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-11	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **21.44 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **61.88 MN/m2/m**

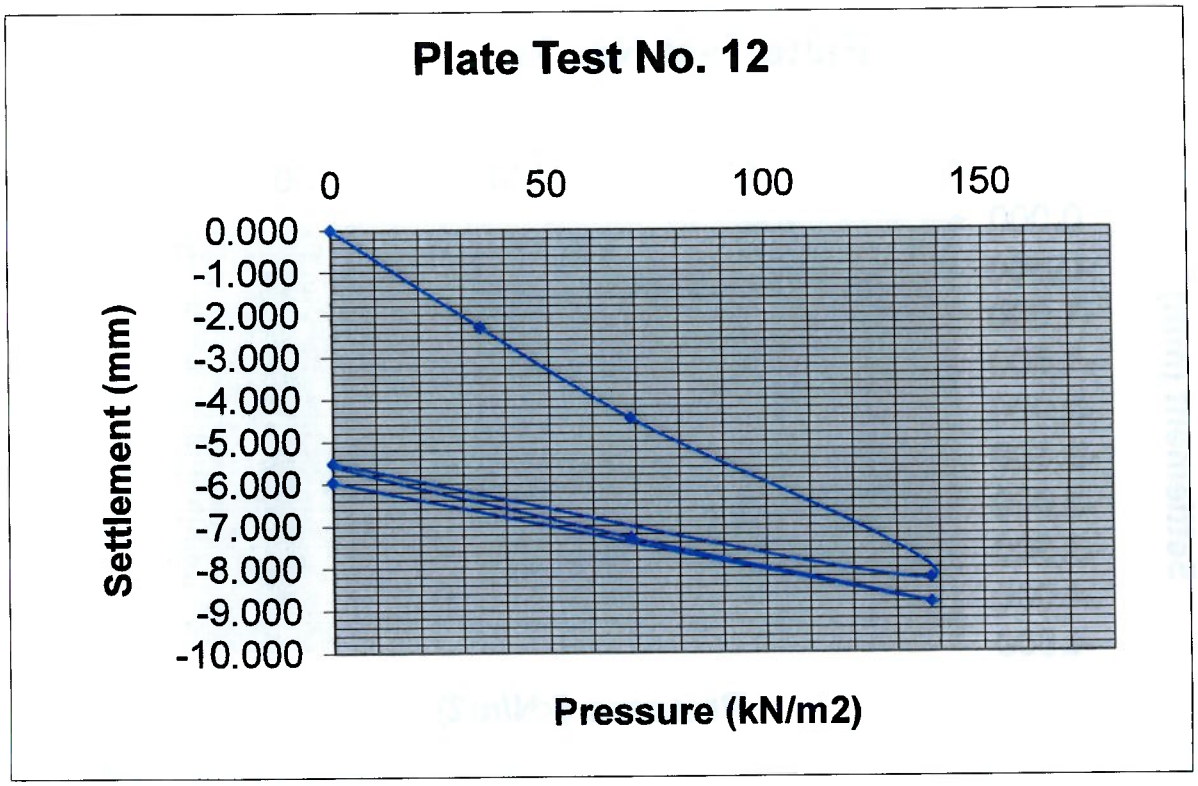
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.96 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **12.28 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-2.3105
69	-4.4655
138	-8.2545
0	-5.5195
69	-7.2965
138	-8.8325
0	-5.9605

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm greyish brown slightly sandy slightly gravelly CLAY with low cobble content
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-12	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **10.44 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **26.24 MN/m2/m**

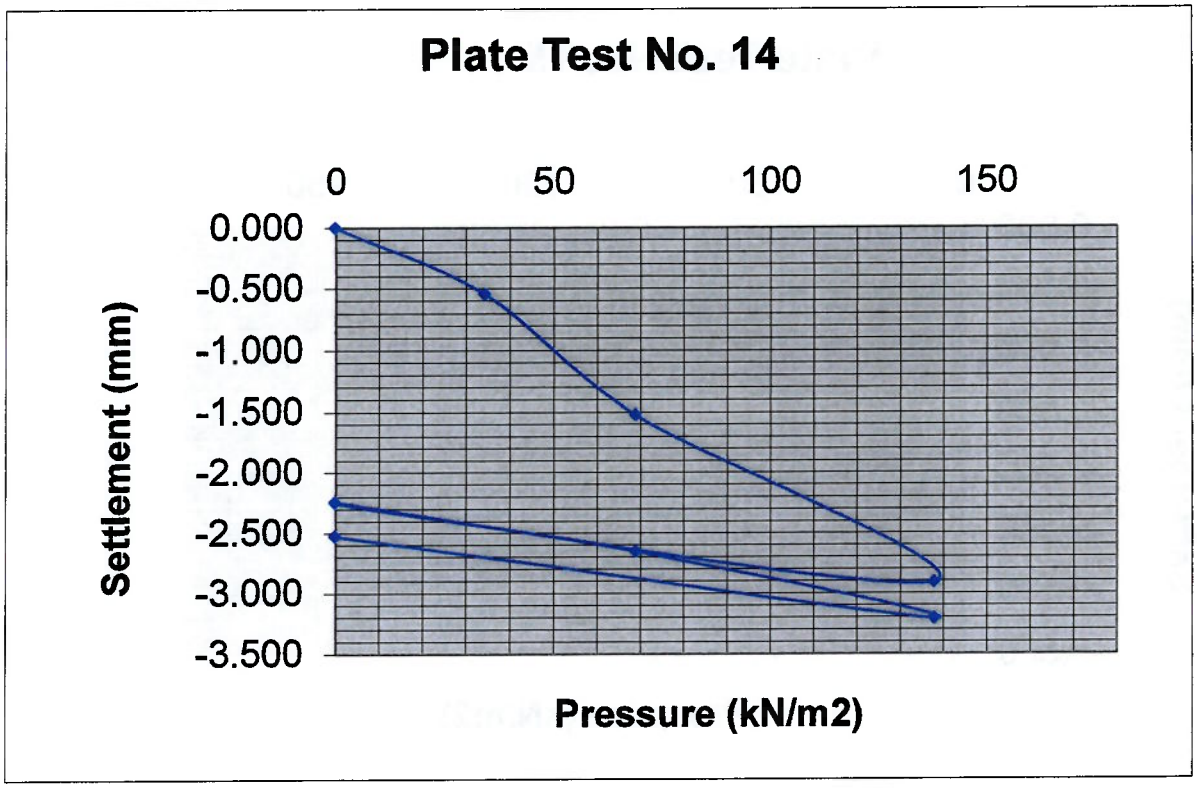
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **0.56 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **2.78 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-0.5465
69	-1.5225
138	-2.914
0	-2.2445
69	-2.6545
138	-3.2125
0	-2.525

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Stiff grey slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-14	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **30.62 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **113.72 MN/m2/m**

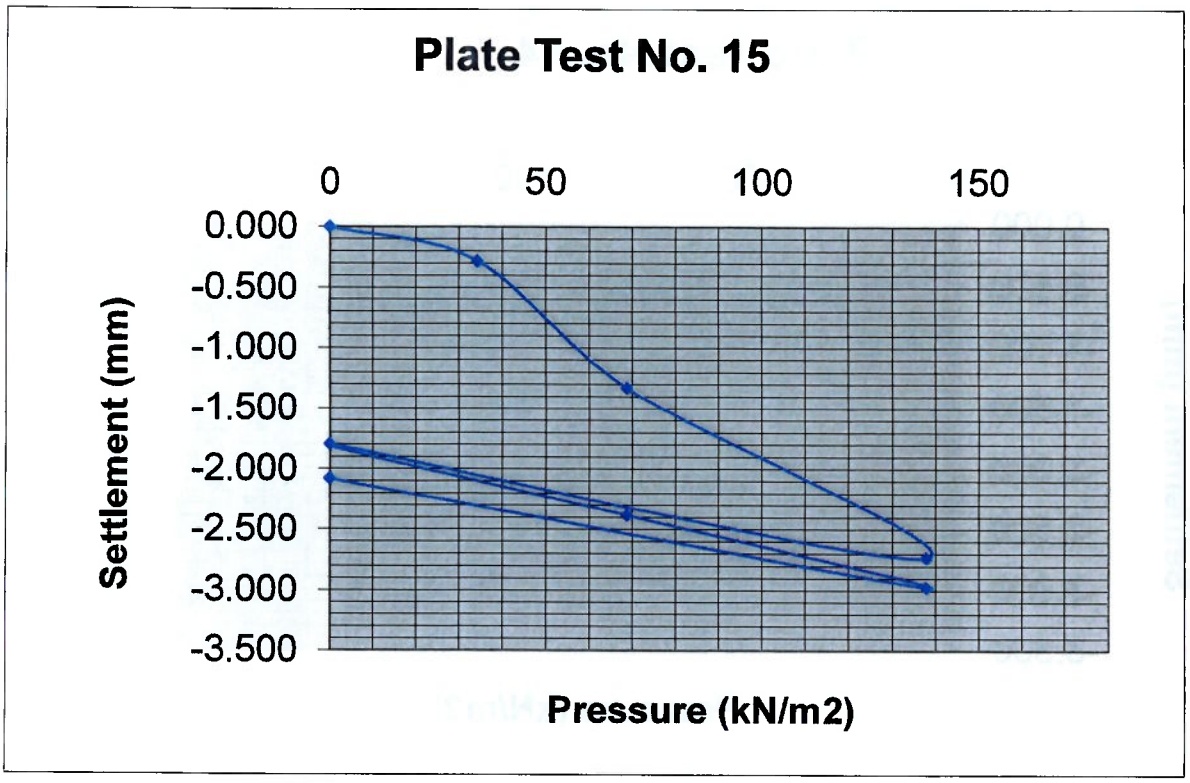
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **3.63 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **35.24 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-0.2855
69	-1.3295
138	-2.733
0	-1.7975
69	-2.3825
138	-2.976
0	-2.0805

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Stiff grey slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	11/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-15	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **35.07 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **79.70 MN/m2/m**

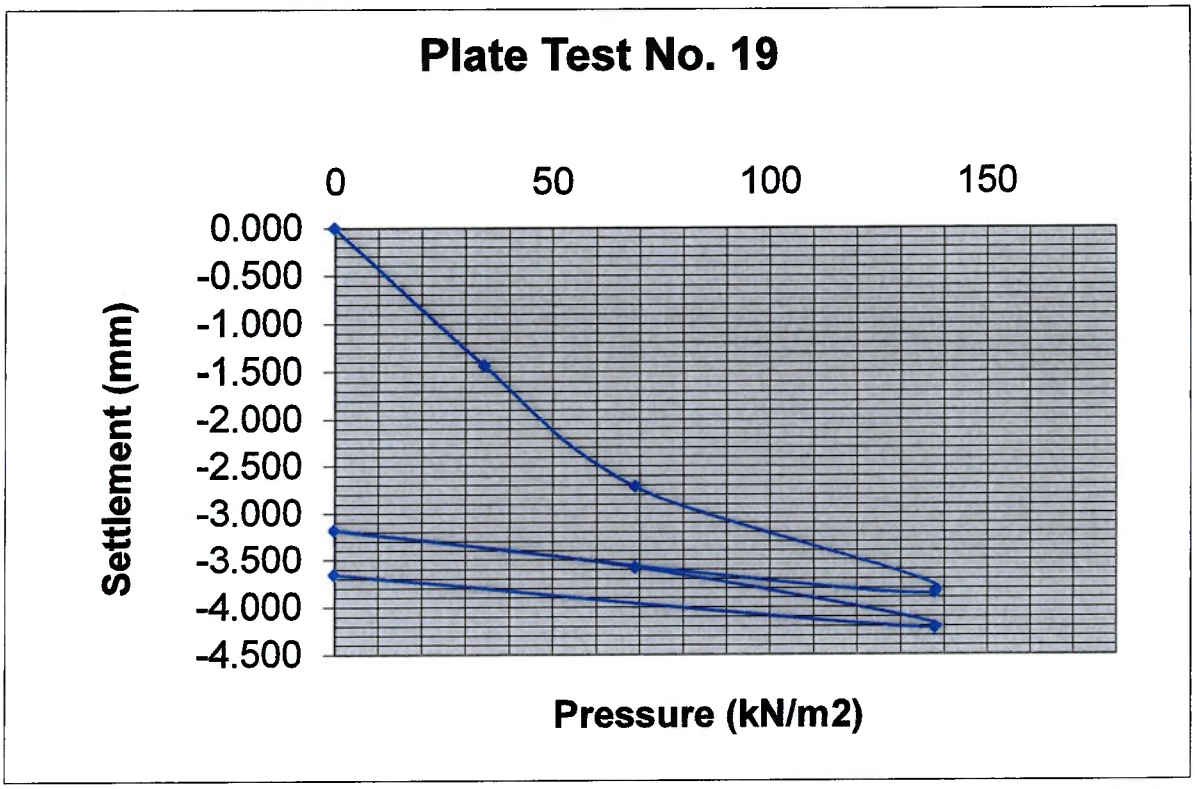
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **4.59 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **19.03 %**

Applied Load (kN/m^2)	Gauge settlement (mm)
0	**0.000**
34.5	-1.4405
69	-2.7175
138	-3.854
0	-3.1795
69	-3.5795
138	-4.223
0	-3.6585

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

LOCATION	Coolpowra Galway	**MATERIAL**	Firm brown slightly sandy gravelly CLAY
CONTRACT NO.	13999-07-24		
DATE	12/09/2024		
CLIENT	Lumcloon Energy	**DEPTH**	0.40m
PLATE DIAMETER	457mm	**NOTES**	
TEST NO.	PBT-19	**SAMPLES**	



Modulus of subgrade reaction, K (Initial) = **17.16 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **116.56 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.33 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **36.78 %**

APPENDIX 7 – Groundwater Monitoring



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Cathernestown House
Hazelhatch Road
Newcastle
Co. Dublin
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

GROUNDWATER MONITORING

Coolpowra Galway

BOREHOLE	DATE	TIME	GROUNDWATER LEVEL		COMMENT
			m BGL	m OD	
BH01	11/10/2024	16:20:00	2.57	46.03	
BH02	11/10/2024	16:30:00	-	-	Standpipe destroyed - unable to dip
BH03	11/10/2024	16:14:00	2.34	49.54	
BH04	11/10/2024	15:52:00	1.80	50.43	
BH05	11/10/2024	15:48:00	2.55	50.72	
BH06	11/10/2024	16:48:00	4.83	49.54	
BH01	25/10/2024	17:00:00	2.04	46.56	
BH03	25/10/2024	16:55:00	2.19	49.69	
BH04	25/10/2024	17:25:00	1.30	50.93	
BH05	25/10/2024	17:23:00	2.19	51.08	
BH06	25/10/2024	16:37:00	2.04	52.33	

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Cathernestown House,
Harelhatch Road
Newcastle
Co. Dublin
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

GROUNDWATER MONITORING

Coolpowra Galway

BOREHOLE	DATE	TIME	GROUNDWATER LEVEL		COMMENT
			m BGL	m OD	
BH01	02/11/2024	10:54:00	2.26	46.34	
BH03	02/11/2024	11:00:00	1.80	50.08	
BH04	02/11/2024	11:04:00	1.42	50.81	
BH05	02/11/2024	11:10:00	1.52	51.75	
BH06	02/11/2024	11:13:00	2.19	52.18	
BH01	08/11/2024	16:07:00	2.27	46.33	
BH03	08/11/2024	16:11:00	1.69	50.19	
BH04	08/11/2024	16:19:00	1.52	50.71	
BH05	08/11/2024	16:17:00	1.70	51.57	Cap removed, full of hair and mud.
BH06	08/11/2024	15:56:00	2.14	52.23	

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Cathernestown House
Hazelnatch Road
Newcastle
Co. Dublin
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

GROUNDWATER MONITORING

Coolpowra Galway

BOREHOLE	DATE	TIME	GROUNDWATER LEVEL		COMMENT
			m BGL	m OD	
BH01	16/11/2024	08:58:00	2.27	46.33	
BH03	16/11/2024	09:02:00	1.67	50.21	
BH04	16/11/2024	09:12:00	1.57	50.66	
BH05	16/11/2024	09:10:00	1.50	51.77	
BH06	16/11/2024	08:57:00	2.14	52.23	

APPENDIX 8 – Laboratory Testing



Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland
D22 K5P8

Attention :	James Cashen
Date :	16th October, 2024
Your reference :	13999-07-24
Our reference :	Test Report 24/17004 Batch 1
Location :	Coolpowra Galway
Date samples received :	4th October, 2024
Status :	Final Report
Issue :	202410161415

Twenty five samples were received for analysis on 4th October, 2024 of which twenty five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 72.11 kg of CO2

Scope 1&2&3 emissions - 170.416 kg of CO2

Authorised By:

Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 3rd Floor Davidson Building, 5 Southampton Street, London WC2E 7HA
Company Registration No: 11371415

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2-5	6-7	8	9-12	13-16	17-18	19-22	23-26	27	LOD/LOR	Units	Method No.
Sample ID	TP01	TP02	TP04	TP06	TP07	TP07	TP07	TP08	TP08	TP10			
Depth	0.50	0.50	0.50	1.50	1.00	2.00	3.00	0.50	1.50	1.50			
COC No / misc													
Containers	T	V J T	T	T	V J T	V J T	T	V J T	V J T	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
Antimony	-	3	-	-	<1	<1	-	<1	<1	-	<1	mg/kg	TM30/PM15
Arsenic #	-	4.1	-	-	3.1	3.9	-	4.3	4.6	-	<0.5	mg/kg	TM30/PM15
Barium #	-	54	-	-	31	24	-	36	11	-	<1	mg/kg	TM30/PM15
Cadmium #	-	<0.1	-	-	0.2	0.2	-	0.2	0.3	-	<0.1	mg/kg	TM30/PM15
Chromium #	-	262.3 AA	-	-	49.9	35.9	-	45.2	8.7	-	<0.5	mg/kg	TM30/PM15
Copper #	-	13	-	-	7	8	-	7	8	-	<1	mg/kg	TM30/PM15
Lead #	-	20	-	-	13	13	-	15	11	-	<5	mg/kg	TM30/PM15
Mercury #	-	0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM30/PM15
Molybdenum #	-	1.1	-	-	3.0	2.2	-	2.7	0.4	-	<0.1	mg/kg	TM30/PM15
Nickel #	-	29.7	-	-	16.2	16.7	-	16.1	9.3	-	<0.7	mg/kg	TM30/PM15
Selenium #	-	<1	-	-	<1	<1	-	<1	<1	-	<1	mg/kg	TM30/PM15
Zinc #	-	37	-	-	30	29	-	30	24	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	<0.03	-	-	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #	-	<0.05	-	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	mg/kg	TM4/PM8
Fluorene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #	-	<0.03	-	-	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Anthracene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #	-	<0.03	-	-	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Pyrene #	-	<0.03	-	-	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	<0.06	-	-	<0.06	<0.06	-	<0.06	<0.06	-	<0.06	mg/kg	TM4/PM8
Chrysene #	-	<0.02	-	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	-	<0.07	-	-	<0.07	<0.07	-	<0.07	<0.07	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Coronene	-	<0.04	-	-	<0.04	<0.04	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	<0.22	-	-	<0.22	<0.22	-	<0.22	<0.22	-	<0.22	mg/kg	TM4/PM8
PAH 17 Total	-	<0.64	-	-	<0.64	<0.64	-	<0.64	<0.64	-	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	<0.05	-	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	<0.02	-	-	<0.02	<0.02	-	<0.02	<0.02	-	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	<1	-	-	<1	<1	-	<1	<1	-	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	93	-	-	90	91	-	94	95	-	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	<30	-	-	<30	<30	-	<30	<30	-	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2-5	6-7	8	9-12	13-16	17-18	19-22	23-26	27	LOD/LOR	Units	Method No.
Sample ID	TP01	TP02	TP04	TP06	TP07	TP07	TP07	TP08	TP08	TP10			
Depth	0.50	0.50	0.50	1.50	1.00	2.00	3.00	0.50	1.50	1.50			
COC No / misc													
Containers	T	VJT	T	T	VJT	VJT	T	VJT	VJT	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	-	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	-	<4	-	-	<4	<4	-	<4	<4	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	-	<26	-	-	<26	<26	-	<26	<26	-	<26	mg/kg	
>C6-C10 (HS_1D_AL)	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	-	<10	-	-	<10	<10	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	-	<10	-	-	<10	<10	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	-	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	-	<4	-	-	<4	<4	-	<4	<4	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	-	<7	-	-	<7	<7	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	-	<26	-	-	<26	<26	-	<26	<26	-	<26	mg/kg	
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	-	<52	-	-	<52	<52	-	<52	<52	-	<52	mg/kg	
>EC6-EC10 (HS_1D_AR)#	-	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	-	<10	-	-	<10	<10	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	-	<10	-	-	<10	<10	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
MTBE#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
Benzene#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
Toluene#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
Ethylbenzene#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
m/p-Xylene#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
o-Xylene#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM36/PM12
PCB 28#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 52#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 101#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 118#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 138#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 153#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 180#	-	<5	-	-	<5	<5	-	<5	<5	-	<5	ug/kg	TM17/PM8
Total 7 PCBs#	-	<35	-	-	<35	<35	-	<35	<35	-	<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1	2-5	6-7	8	9-12	13-16	17-18	19-22	23-26	27	LOD/LOR	Units	Method No.
Sample ID	TP01	TP02	TP04	TP06	TP07	TP07	TP07	TP08	TP08	TP10			
Depth	0.50	0.50	0.50	1.50	1.00	2.00	3.00	0.50	1.50	1.50			
COC No / misc													
Containers	T	V J T	T	T	V J T	V J T	T	V J T	V J T	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
Natural Moisture Content	-	16.8	-	-	20.2	20.6	-	22.2	17.1	-	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	-	14.4	-	-	16.8	17.1	-	18.2	14.6	-	<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	-	-	<0.3	<0.3	-	<0.3	<0.3	-	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0306	-	0.0023	0.0057	-	-	0.0125	-	-	0.0116	<0.0015	g/l	TM38/PM20
Chromium III	-	262.3	-	-	49.9	35.9	-	45.2	8.7	-	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	-	0.41	-	-	1.02	0.69	-	1.27	0.18	-	<0.02	%	TM21/PM24
Loss on Ignition #	-	-	-	-	-	-	-	-	-	-	<1.0	%	TM22/PM0
pH #	8.49	8.58	8.41	8.72	8.41	8.13	8.26	8.23	8.77	8.73	<0.01	pH units	TM73/PM11

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	28-31	32-33	34-37	38-41	42-45	46	47	48-51	52-55	56-57			
Sample ID	TP12	TP13	TP14	TP14	TP15	TP18	TP22	TP24	TP25	TP26			
Depth	1.00	2.50	0.50	1.50	1.00	0.50	2.50	0.50	0.50	1.00			
COC No / misc													
Containers	V J T	T	V J T	V J T	V J T	T	T	V J T	V J T	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	LOD/LOR	Units	Method No.
Antimony	<1	-	<1	<1	<1	-	-	1	<1	-	<1	mg/kg	TM30/PM15
Arsenic#	3.0	-	3.9	3.5	2.8	-	-	12.9	4.9	-	<0.5	mg/kg	TM30/PM15
Barium#	50	-	32	25	23	-	-	112	22	-	<1	mg/kg	TM30/PM15
Cadmium#	0.4	-	0.3	0.3	<0.1	-	-	0.3	0.2	-	<0.1	mg/kg	TM30/PM15
Chromium#	39.1	-	33.7	73.4	62.7	-	-	27.8	25.0	-	<0.5	mg/kg	TM30/PM15
Copper#	9	-	9	8	8	-	-	29	7	-	<1	mg/kg	TM30/PM15
Lead#	21	-	12	11	10	-	-	22	12	-	<5	mg/kg	TM30/PM15
Mercury#	0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM30/PM15
Molybdenum#	0.4	-	2.1	0.7	3.8	-	-	1.1	1.6	-	<0.1	mg/kg	TM30/PM15
Nickel#	8.4	-	15.7	15.1	13.0	-	-	36.4	14.9	-	<0.7	mg/kg	TM30/PM15
Selenium#	<1	-	1	<1	<1	-	-	2	<1	-	<1	mg/kg	TM30/PM15
Zinc#	25	-	28	25	19	-	-	102	23	-	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Acenaphthene#	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	-	<0.05	mg/kg	TM4/PM8
Fluorene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Phenanthrene#	<0.03	-	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Anthracene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Fluoranthene#	<0.03	-	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Pyrene#	<0.03	-	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene#	<0.06	-	<0.06	<0.06	<0.06	-	-	<0.06	<0.06	-	<0.06	mg/kg	TM4/PM8
Chrysene#	<0.02	-	<0.02	<0.02	<0.02	-	-	<0.02	<0.02	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene#	<0.07	-	<0.07	<0.07	<0.07	-	-	<0.07	<0.07	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene#	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	-	<0.04	mg/kg	TM4/PM8
PAH 6 Total#	<0.22	-	<0.22	<0.22	<0.22	-	-	<0.22	<0.22	-	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	-	<0.64	<0.64	<0.64	-	-	<0.64	<0.64	-	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	<0.02	<0.02	<0.02	-	-	<0.02	<0.02	-	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	-	<1	<1	<1	-	-	<1	<1	-	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	-	97	98	95	-	-	91	96	-	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	<30	<30	<30	-	-	<30	<30	-	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	28-31	32-33	34-37	38-41	42-45	46	47	48-51	52-55	56-57	LOD/LOR	Units	Method No.
Sample ID	TP12	TP13	TP14	TP14	TP15	TP18	TP22	TP24	TP25	TP26			
Depth	1.00	2.50	0.50	1.50	1.00	0.50	2.50	0.50	0.50	1.00			
COC No / misc													
Containers	V J T	T	V J T	V J T	V J T	T	T	V J T	V J T	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	-	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	-	<4	<4	<4	-	-	<4	<4	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	-	<7	<7	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	15	-	16	22	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	-	<7	<7	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	-	<26	<26	<26	-	-	<26	<26	-	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	-	<10	<10	<10	-	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	15	-	16	22	<10	-	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	-	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	-	<4	<4	<4	-	-	<4	<4	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	-	<7	<7	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	19	-	46	59	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	-	<7	<7	<7	-	-	<7	<7	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	-	46	59	<26	-	-	<26	<26	-	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	-	<52	59	<52	-	-	<52	<52	-	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1	-	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	-	<10	<10	<10	-	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	19	-	46	59	<10	-	-	<10	<10	-	<10	mg/kg	TM5/PM8/PM16
MTBE#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
Benzene#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
Toluene#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
o-Xylene#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM36/PM12
PCB 28#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 52#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 101#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 118#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 138#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 153#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
PCB 180#	<5	-	<5	<5	<5	-	-	<5	<5	-	<5	ug/kg	TM17/PM8
Total 7 PCBs#	<35	-	<35	<35	<35	-	-	<35	<35	-	<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	28-31	32-33	34-37	38-41	42-45	46	47	48-51	52-55	56-57	LOD/LOR	Units	Method No.
Sample ID	TP12	TP13	TP14	TP14	TP15	TP18	TP22	TP24	TP25	TP26			
Depth	1.00	2.50	0.50	1.50	1.00	0.50	2.50	0.50	0.50	1.00			
COC No / misc													
Containers	V J T	T	V J T	V J T	V J T	T	T	V J T	V J T	T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
Natural Moisture Content	25.7	-	15.3	28.1	14.0	-	-	11.3	11.1	-	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	20.4	-	13.3	21.9	12.3	-	-	10.1	10.0	-	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	<0.3	<0.3	-	-	<0.3	<0.3	-	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0094	-	-	-	-	0.1657	-	-	0.0922	<0.0015	g/l	TM38/PM20
Chromium III	39.1	-	33.7	73.4	62.7	-	-	27.8	25.0	-	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.95	-	1.98	2.31	0.17	-	-	0.51	0.29	-	<0.02	%	TM21/PM24
Loss on Ignition #	-	-	-	-	-	74.4	-	-	-	-	<1.0	%	TM22/PM0
pH #	8.50	8.88	8.04	7.91	8.77	-	7.81	7.98	8.55	8.38	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	58-61	62	63-64	65-66	69							
Sample ID	TP30	TP30	TP35	TP37	TP36							
Depth	0.50	2.00	1.50	1.00	0.50							
COC No / misc												
Containers	V J T	T	T	V J T	T							
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1							
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024							

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Antimony	2	-	-	<1	-						<1	mg/kg	TM30/PM15
Arsenic #	12.7	-	-	5.7	-						<0.5	mg/kg	TM30/PM15
Barium #	54	-	-	23	-						<1	mg/kg	TM30/PM15
Cadmium #	0.3	-	-	0.2	-						<0.1	mg/kg	TM30/PM15
Chromium #	30.5	-	-	17.7	-						<0.5	mg/kg	TM30/PM15
Copper #	16	-	-	11	-						<1	mg/kg	TM30/PM15
Lead #	25	-	-	10	-						<5	mg/kg	TM30/PM15
Mercury #	0.1	-	-	<0.1	-						<0.1	mg/kg	TM30/PM15
Molybdenum #	1.9	-	-	1.2	-						<0.1	mg/kg	TM30/PM15
Nickel #	32.8	-	-	20.0	-						<0.7	mg/kg	TM30/PM15
Selenium #	1	-	-	<1	-						<1	mg/kg	TM30/PM15
Zinc #	70	-	-	34	-						<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	-	<0.03	-						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	-	<0.05	-						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	-	-	<0.03	-						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	-	-	<0.03	-						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	-	-	<0.03	-						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	-	-	<0.06	-						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	-	-	<0.02	-						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	-	-	<0.07	-						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	-	-	<0.04	-						<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	-	-	<0.22	-						<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	-	-	<0.64	-						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	-	<0.05	-						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	-	<0.02	-						<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	-	-	<1	-						<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98	-	-	93	-						<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	-	-	<30	-						<30	mg/kg	TM5/PM8/PM16

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	58-61	62	63-64	65-68	69							
Sample ID	TP30	TP30	TP35	TP37	TP38							
Depth	0.50	2.00	1.50	1.00	0.50							
COC No / misc												
Containers	V J T	T	T	V J T	T							
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1							
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024							
											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	-	-	<0.2	-						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	-	-	<4	-						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	-	-	<26	-						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	-	-	<10	-						<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	-	-	<10	-						<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	-	-	<0.2	-						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	-	-	<4	-						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	-	-	<7	-						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	-	-	<26	-						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	-	-	<52	-						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR) #	<0.1	-	-	<0.1	-						<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	-	-	<10	-						<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	-	-	<10	-						<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
Benzene #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
Toluene #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
o-Xylene #	<5	-	-	<5	-						<5	ug/kg	TM36/PM12
PCB 28 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 52 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 101 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 118 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 138 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 153 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
PCB 180 #	<5	-	-	<5	-						<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	-	-	<35	-						<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	58-61	62	63-64	65-68	69						LOD/LOR	Units	Method No.
Sample ID	TP30	TP30	TP35	TP37	TP38								
Depth	0.50	2.00	1.50	1.00	0.50								
COC No / misc													
Containers	V J T	T	T	V J T	T								
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024								
Natural Moisture Content	26.0	-	-	17.5	-						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	20.7	-	-	14.9	-						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	-	<0.3	-						<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0044	0.0093	-	0.0165						<0.0015	g/l	TM38/PM20
Chromium III	30.5	-	-	17.7	-						<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.71	-	-	0.19	-						<0.02	%	TM21/PM24
Loss on Ignition #	-	-	-	-	-						<1.0	%	TM22/PM0
pH #	8.35	8.80	8.96	8.61	8.86						<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	2-5	9-12	13-16	19-22	23-26	28-31	34-37	38-41	42-45	48-51	LOD/LOR	Units	Method No.
Sample ID	TP02	TP07	TP07	TP08	TP08	TP12	TP14	TP14	TP15	TP24			
Depth	0.50	1.00	2.00	0.50	1.50	1.00	0.50	1.50	1.00	0.50			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024			
Dissolved Antimony #	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.003	0.004	0.004	<0.003	<0.003	<0.003	0.004	0.007	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.03	0.04	0.04	<0.03	<0.03	<0.03	0.04	0.07	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	0.002	0.006	<0.002	<0.002	<0.002	<0.002	0.006	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.6	0.4	0.4	0.5	<0.3	0.5	0.4	0.3	0.3	0.8	<0.3	mg/l	TM173/PM0
Fluoride	6	4	4	5	<3	5	4	<3	3	8	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	20.2	<0.5	<0.5	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	<5	<5	<5	<5	<5	<5	<5	202	<5	<5	<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1081	0.1089	0.1075	0.1098	0.1056	0.1074	0.1049	0.1226	0.1025	0.1087		kg	NONE/PM17
Chloride #	<0.3	<0.3	0.5	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM38/PM0
Chloride #	<3	<3	5	<3	<3	<3	<3	<3	<3	<3	<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17
Dissolved Organic Carbon	4	6	6	6	2	4	8	6	2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	40	60	60	60	20	40	80	60	20	<20	<20	mg/kg	TM60/PM0
pH	7.99	8.00	8.29	8.06	7.93	7.97	8.03	8.12	7.97	8.19	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	2-5	9-12	13-16	19-22	23-26	28-31	34-37	38-41	42-45	48-51			
Sample ID	TP02	TP07	TP07	TP08	TP08	TP12	TP14	TP14	TP15	TP24			
Depth	0.50	1.00	2.00	0.50	1.50	1.00	0.50	1.50	1.00	0.50			
COC No / misc											Please see attached notes for all abbreviations and acronyms		
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	LOD/LOR	Units	Method No.
Total Dissolved Solids #	65	74	98	65	<35	41	78	114	<35	<35	<35	mg/l	TM20/PM0
Total Dissolved Solids #	650	740	980	650	<350	410	780	1140	<350	<350	<350	mg/kg	TM20/PM0

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	52-55	58-61	65-68	LOD/LOR	Units	Method No.
Sample ID	TP25	TP30	TP37			
Depth	0.50	0.50	1.00			
COC No / misc						
Containers	V J T	V J T	V J T			
Sample Date	02/10/2024	02/10/2024	02/10/2024			
Sample Type	Soil	Soil	Soil			
Batch Number	1	1	1			
Date of Receipt	04/10/2024	04/10/2024	04/10/2024			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.4	0.7	0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	7	3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	<0.5	<0.5	<0.5	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	<5	<5	<5	<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1	0.1084	0.1042		kg	NONE/PM17
Chloride #	<0.3	<0.3	<0.3	<0.3	mg/l	TM38/PM0
Chloride #	<3	<3	<3	<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09	0.09	0.09		kg	NONE/PM17
Dissolved Organic Carbon	<2	<2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	mg/kg	TM60/PM0
pH	7.96	8.09	7.99	<0.01	pH units	TM73/PM0

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	52-55	58-61	65-68								LOD/LOR	Units	Method No.
Sample ID	TP25	TP30	TP37										
Depth	0.50	0.50	1.00										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	02/10/2024	02/10/2024	02/10/2024										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	04/10/2024	04/10/2024	04/10/2024										
Total Dissolved Solids #	<35	60	<35								<35	mg/l	TM20/PM0
Total Dissolved Solids #	<350	600	<350								<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	2-5	9-12	13-16	19-22	23-26	28-31	34-37	38-41	42-45	48-51	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP02	TP07	TP07	TP08	TP08	TP12	TP14	TP14	TP15	TP24						
Depth	0.50	1.00	2.00	0.50	1.50	1.00	0.50	1.50	1.00	0.50						
COC No / misc																
Containers	VJT	VJT	VJT	VJT	VJT	VJT	VJT	VJT	VJT	VJT						
Sample Date	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024	02/10/2024						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1						
Date of Receipt	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024	04/10/2024						
Solid Waste Analysis																
Total Organic Carbon#	0.41	1.02	0.69	1.27	0.18	0.95	1.98	2.31	0.17	0.51	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs#	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6#	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic#	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium#	0.03	0.04	0.04	<0.03	<0.03	<0.03	0.04	0.07	<0.03	<0.03	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium#	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium#	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper#	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury#	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum#	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel#	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead#	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony#	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium#	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc#	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids#	650	740	980	650	<350	410	780	1140	<350	<350	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	40	60	60	60	20	40	80	60	20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1081	0.1089	0.1075	0.1098	0.1056	0.1074	0.1049	0.1226	0.1025	0.1087	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	83.0	82.6	83.9	81.7	85.4	84.1	85.8	73.3	87.9	82.6	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.882	0.881	0.883	0.88	0.885	0.883	0.885	0.867	0.888	0.881	-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	20.5	21.1	19.2	22.4	17.1	18.9	16.6	36.4	13.7	21.1	-	-	-	<0.1	%	PM4/PM0
pH#	8.58	8.41	8.13	8.23	8.77	8.50	8.04	7.91	8.77	7.98	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	6	4	4	5	<3	5	4	<3	3	8	10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4#	<5	<5	<5	<5	<5	<5	<5	202	<5	<5	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride#	<3	<3	5	<3	<3	<3	<3	<3	<3	<3	800	15000	25000	<3	mg/kg	TM38/PM0

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen
EMT Job No: 24/17004

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	52-55	58-61	65-68												
Sample ID	TP25	TP30	TP37												
Depth	0.50	0.50	1.00												
COC No / misc															
Containers	V J T	V J T	V J T												
Sample Date	02/10/2024	02/10/2024	02/10/2024												
Sample Type	Soil	Soil	Soil												
Batch Number	1	1	1												
Date of Receipt	04/10/2024	04/10/2024	04/10/2024								Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.29	0.71	0.19								3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025								6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035								1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30								500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22								-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64								100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025								0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	<0.03	<0.03								20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005								0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015								0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07								2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001								0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	<0.02	<0.02	<0.02								0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02								0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05								0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02								0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03								0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03								4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	<350	600	<350								4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20								500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1	0.1084	0.1042								-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	90.0	82.7	86.5								-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.89	0.881	0.886								-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	11.1	20.9	15.6								-	-	-	<0.1	%	PM4/PM0
pH #	8.55	8.35	8.61								-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1								1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	4	7	3								10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	<5	<5	<5								1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	<3	<3	<3								800	15000	25000	<3	mg/kg	TM38/PM0

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EPH Interpretation Report

Matrix : Solid

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
24/17004	1	TP02	0.50	2-5	No interpretation possible
24/17004	1	TP07	1.00	9-12	No interpretation possible
24/17004	1	TP07	2.00	13-16	No interpretation possible
24/17004	1	TP08	0.50	19-22	No interpretation possible
24/17004	1	TP08	1.50	23-26	No interpretation possible
24/17004	1	TP12	1.00	28-31	No interpretation possible
24/17004	1	TP14	0.50	34-37	No interpretation possible
24/17004	1	TP14	1.50	38-41	Traces of unknown Hydrocarbons and traces of possible naturally occurring compounds
24/17004	1	TP15	1.00	42-45	No interpretation possible
24/17004	1	TP24	0.50	48-51	No interpretation possible
24/17004	1	TP25	0.50	52-55	No interpretation possible
24/17004	1	TP30	0.50	58-61	No interpretation possible
24/17004	1	TP37	1.00	65-68	No interpretation possible

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Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/17004	1	TP02	0.50	5	Catherine Coles	07/10/2024	**General Description (Bulk Analysis)**	brown soil,stone
					Catherine Coles	07/10/2024	**Asbestos Fibres**	NAD
					Catherine Coles	07/10/2024	**Asbestos ACM**	NAD
					Catherine Coles	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP07	1.00	12	Kieran Hunt	08/10/2024	**General Description (Bulk Analysis)**	Brown soil / stones
					Kieran Hunt	08/10/2024	**Asbestos Fibres**	NAD
					Kieran Hunt	08/10/2024	**Asbestos ACM**	NAD
					Kieran Hunt	08/10/2024	**Asbestos Type**	NAD
24/17004	1	TP07	2.00	16	Simon Postlewhite	07/10/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	07/10/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	07/10/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP08	0.50	22	Catherine Coles	07/10/2024	**General Description (Bulk Analysis)**	brown soil,stone
					Catherine Coles	07/10/2024	**Asbestos Fibres**	NAD
					Catherine Coles	07/10/2024	**Asbestos ACM**	NAD
					Catherine Coles	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP08	1.50	26	Kieran Hunt	07/10/2024	**General Description (Bulk Analysis)**	Brown soil / stones
					Kieran Hunt	07/10/2024	**Asbestos Fibres**	NAD
					Kieran Hunt	07/10/2024	**Asbestos ACM**	NAD
					Kieran Hunt	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP12	1.00	31	Catherine Coles	07/10/2024	**General Description (Bulk Analysis)**	brown soil,stone
					Catherine Coles	07/10/2024	**Asbestos Fibres**	NAD
					Catherine Coles	07/10/2024	**Asbestos ACM**	NAD
					Catherine Coles	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP14	0.50	37	Catherine Coles	07/10/2024	**General Description (Bulk Analysis)**	brown soil,stone
					Catherine Coles	07/10/2024	**Asbestos Fibres**	NAD
					Catherine Coles	07/10/2024	**Asbestos ACM**	NAD
					Catherine Coles	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP14	1.50	41	Kieran Hunt	08/10/2024	**General Description (Bulk Analysis)**	Brown soil / stones
					Kieran Hunt	08/10/2024	**Asbestos Fibres**	NAD
					Kieran Hunt	08/10/2024	**Asbestos ACM**	NAD
					Kieran Hunt	08/10/2024	**Asbestos Type**	NAD

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/17004	1	TP15	1.00	45	Emily Smith	07/10/2024	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Smith	07/10/2024	**Asbestos Fibres**	NAD
					Emily Smith	07/10/2024	**Asbestos ACM**	NAD
					Emily Smith	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP24	0.50	51	Simon Postlewhite	07/10/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	07/10/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	07/10/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP25	0.50	55	Emily Smith	07/10/2024	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Smith	07/10/2024	**Asbestos Fibres**	NAD
					Emily Smith	07/10/2024	**Asbestos ACM**	NAD
					Emily Smith	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP30	0.50	61	Kieran Hunt	07/10/2024	**General Description (Bulk Analysis)**	Brown soil / stones
					Kieran Hunt	07/10/2024	**Asbestos Fibres**	NAD
					Kieran Hunt	07/10/2024	**Asbestos ACM**	NAD
					Kieran Hunt	07/10/2024	**Asbestos Type**	NAD
24/17004	1	TP37	1.00	68	Emily Smith	08/10/2024	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Smith	08/10/2024	**Asbestos Fibres**	NAD
					Emily Smith	08/10/2024	**Asbestos ACM**	NAD
					Emily Smith	08/10/2024	**Asbestos Type**	NAD

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Notification of Deviating Samples

Client Name: Ground Investigations Ireland
Reference: 13999-07-24
Location: Coolpowra Galway
Contact: James Cashen

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 24/17004						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

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NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/17004

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 24/17004

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes

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Method Code Appendix

EMT Job No: 24/17004

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

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EMT Job No: 24/17004

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

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LABORATORY REPORT

Contract Number: PSL24/7255

Report Date:	29 October 2024
Client's Reference:	13999-07-24
Client Name:	Ground Investigations Ireland Ltd Catherinestown House Hazelhatch Road Newcastle Co Dublin D22 YD52
For the attention of:	**James Cashen**
Contract Title:	Coolpowra Galway
Date Received:	3/10/2024
Date Commenced:	3/10/2024
Date Completed:	29/10/2024
Notes:	**Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Managing Director)	R Berriman (Associate Director)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
TP01		B&D	0.50		13.2			29	14	15	77	Low Plasticity CIL
TP01		B&D	1.50		10.2				NP			
TP04		B&D	0.50		18.8			35	19	16	44	Medium Plasticity CIM
TP05		B&D	1.50		8.9				NP			
TP06		B&D	0.50		17.4			27	14	13	52	Low Plasticity CIL
TP07		B&D	2.00		20.9			37	19	18	47	Medium Plasticity CIM
TP08		B&D	1.50		17.9			31	17	14	50	Low Plasticity CIL
TP10		B&D	0.50		13.5				NP			
TP12		B&D	1.00		20.4			45	21	24	80	Medium Plasticity CIM
TP13		B&D	0.50		12.7			25	12	13	59	Low Plasticity CIL
TP16		B&D	0.50		13.5			27	12	15	35	Low Plasticity CIL
TP19		B&D	1.50		18.9			32	17	15	65	Low Plasticity CIL
TP22		B&D	0.50		22.1			39	22	17	85	Medium Plasticity CIM
TP22		B&D	2.50		10.4				NP			
TP24		B&D	0.50		27.7			54	26	28	82	High Plasticity CIH

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

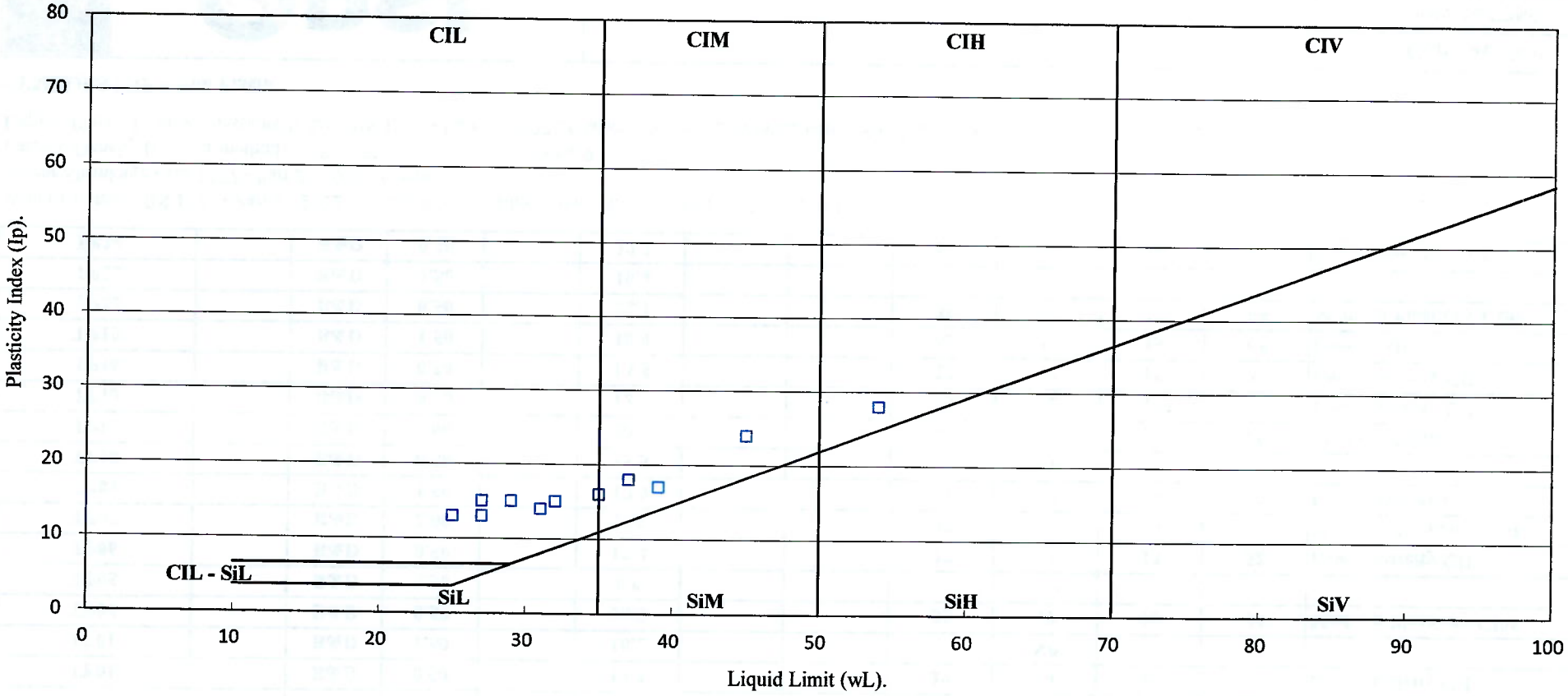
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
TP26		B&D	1.00		19.3				NP			
TP29		B&D	1.50		11.3			30	14	16	36	Low Plasticity CIL
TP31		B&D	1.00		18.9				NP			
TP33		B&D	0.50		21.0			47	24	23	89	Medium Plasticity CIM
TP34		B&D	1.00		9.7				NP			
TP35		B&D	1.50		8.8				NP			
TP38		B&D	0.50		13.8			27	13	14	81	Low Plasticity CIL
TP09		B&D	1.00		13.1			26	14	12	27	Low Plasticity CIL
TP10		B&D	1.50		15.4				NP			
TP11		B&D	2.50		11.0				NP			
TP13		B&D	2.50		10.6				NP			
TP20		B&D	1.50		9.3				NP			
TP26		B&D	2.00		10.3				NP			
TP36		B&D	0.50		14.1			26	16	10	49	

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

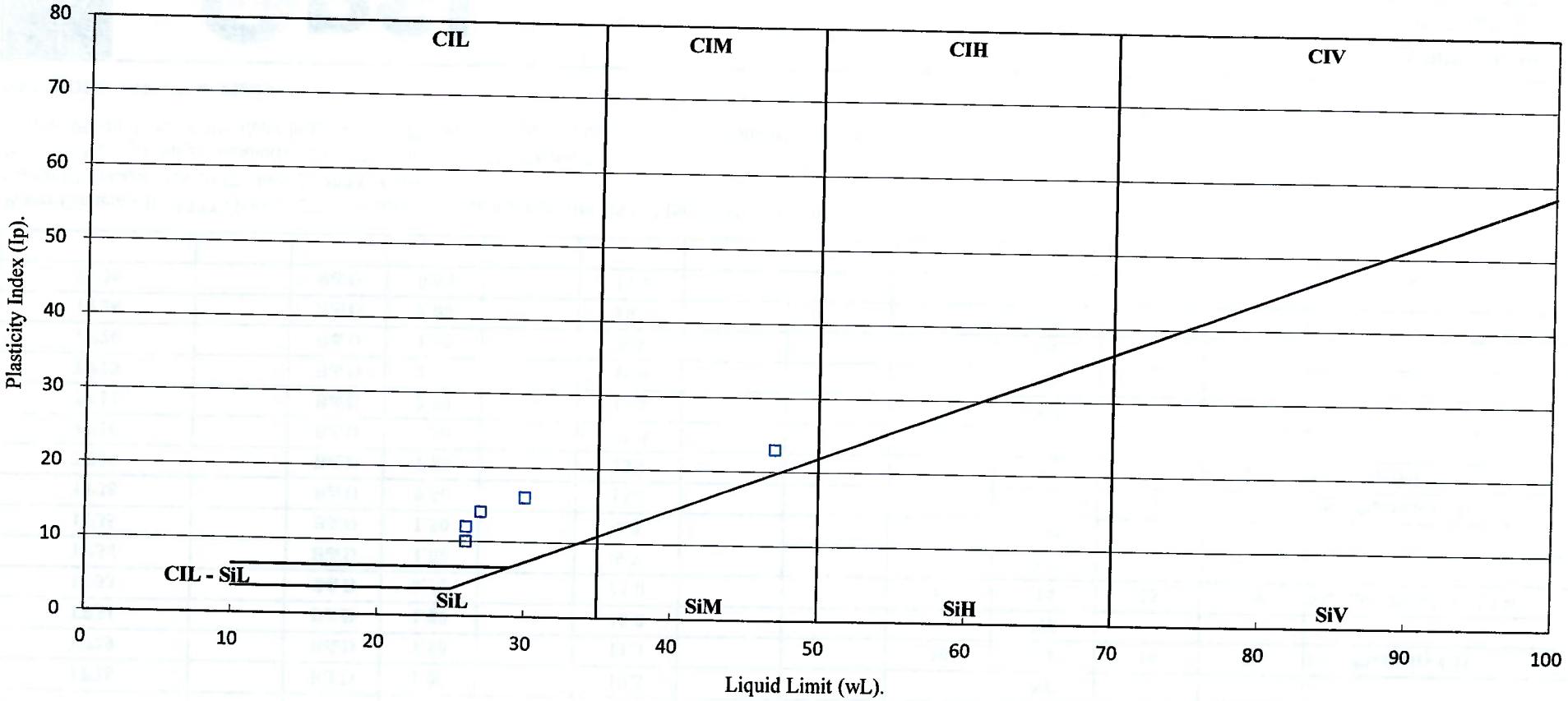
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Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHERRA GROUP COMPANY

Coolpowra Galway	Contract No: PSL24/7255
	Client Ref:

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP01		B&D	0.50		Brown sandy slightly gravelly CLAY.
TP01		B&D	1.50		Grey clayey sandy GRAVEL with cobbles.
TP02		B&D	1.50		Grey slightly sandy GRAVEL.
TP03		B&D	0.50		Brown very clayey sandy GRAVEL.
TP04		B&D	0.50		Grey very clayey very sandy GRAVEL.
TP05		B&D	1.50		Brown clayey very sandy GRAVEL.
TP06		B&D	0.50		Brown slightly sandy gravelly CLAY.
TP07		B&D	2.00		Grey very clayey very sandy GRAVEL.
TP08		B&D	1.50		Grey slightly sandy gravelly CLAY.
TP10		B&D	0.50		Brown silty very sandy GRAVEL.
TP12		B&D	1.00		Grey slightly sandy slightly gravelly CLAY.
TP13		B&D	0.50		Grey slightly sandy slightly gravelly CLAY.
TP16		B&D	0.50		Brown very clayey very sandy GRAVEL.
TP19		B&D	1.50		Brown slightly sandy slightly gravelly CLAY.
TP22		B&D	0.50		Grey slightly sandy slightly gravelly CLAY.
TP22		B&D	2.50		Grey silty very gravelly SAND.
TP24		B&D	0.50		Brown slightly sandy slightly gravelly CLAY.
TP26		B&D	1.00		Grey very silty slightly gravelly SAND.
TP29		B&D	1.50		Grey slightly sandy gravelly CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP31		B&D	1.00		Grey silty slightly gravelly SAND.
TP33		B&D	0.50		Brown slightly sandy slightly gravelly CLAY.
TP34		B&D	1.00		Brown clayey very sandy GRAVEL.
TP35		B&D	1.50		Brown silty sandy GRAVEL.
TP38		B&D	0.50		Grey sandy slightly gravelly CLAY.
TP09		B&D	1.00		Brown mottled grey very clayey sandy GRAVEL with many cobbles.
TP10		B&D	1.50		Brown silty slightly gravelly SAND.
TP11		B&D	2.50		Brown mottled grey clayey very sandy GRAVEL with some cobbles.
TP13		B&D	2.50		Brown mottled grey clayey sandy GRAVEL with many cobbles.
TP20		B&D	1.50		Brown mottled grey clayey very sandy GRAVEL with some cobbles.
TP26		B&D	2.00		Dark grey silty very sandy GRAVEL with cobbles.
TP36		B&D	0.50		Brown very clayey gravelly SAND.

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PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

PARTICLE SIZE DISTRIBUTION TEST

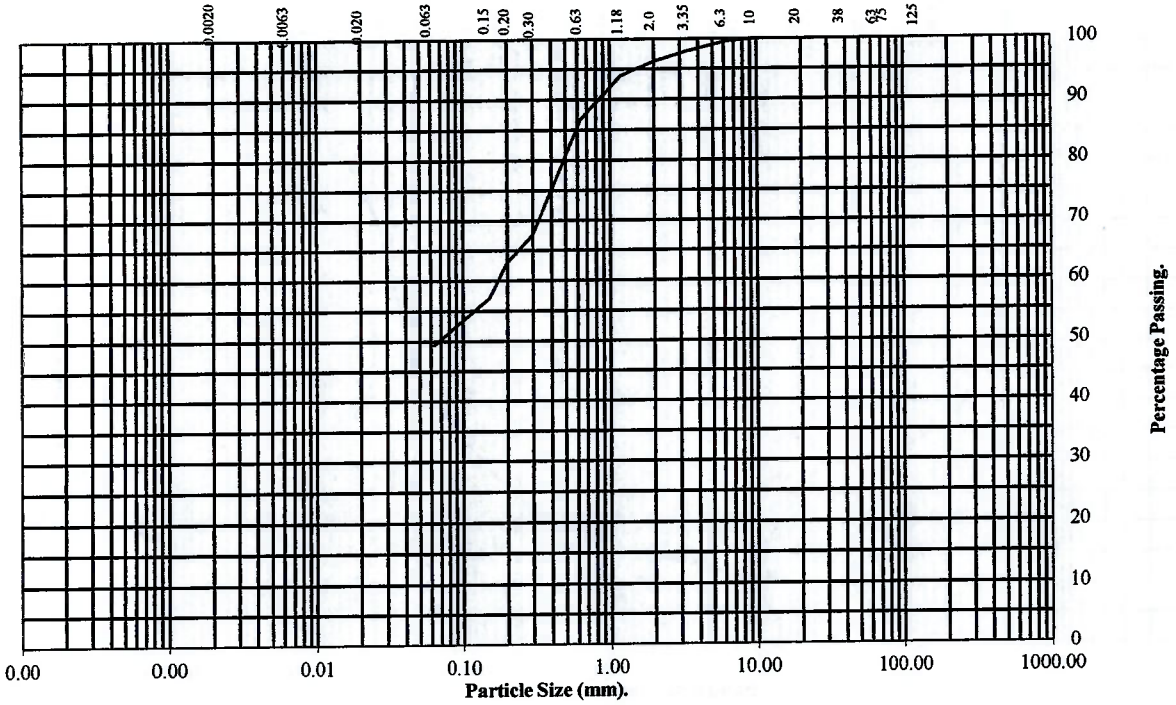
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP01 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	98
2	96
1.18	94
0.63	87
0.3	68
0.2	63
0.15	57
0.063	49

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	47
Silt/Clay	49

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

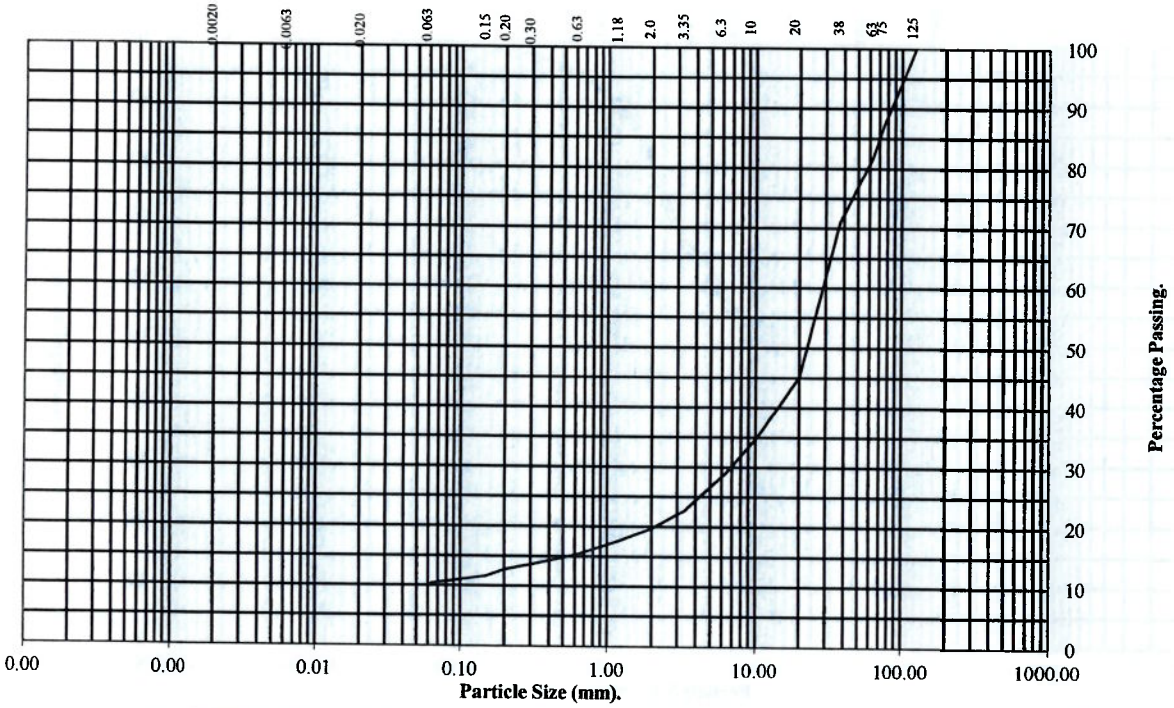
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP01 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	87
63	82
37.5	71
20	45
10	35
6.3	29
3.35	23
2	20
1.18	18
0.63	15
0.3	14
0.2	13
0.15	12
0.063	10

Soil Fraction	Total Percentage
Cobbles	18
Gravel	62
Sand	10
Silt/Clay	10

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

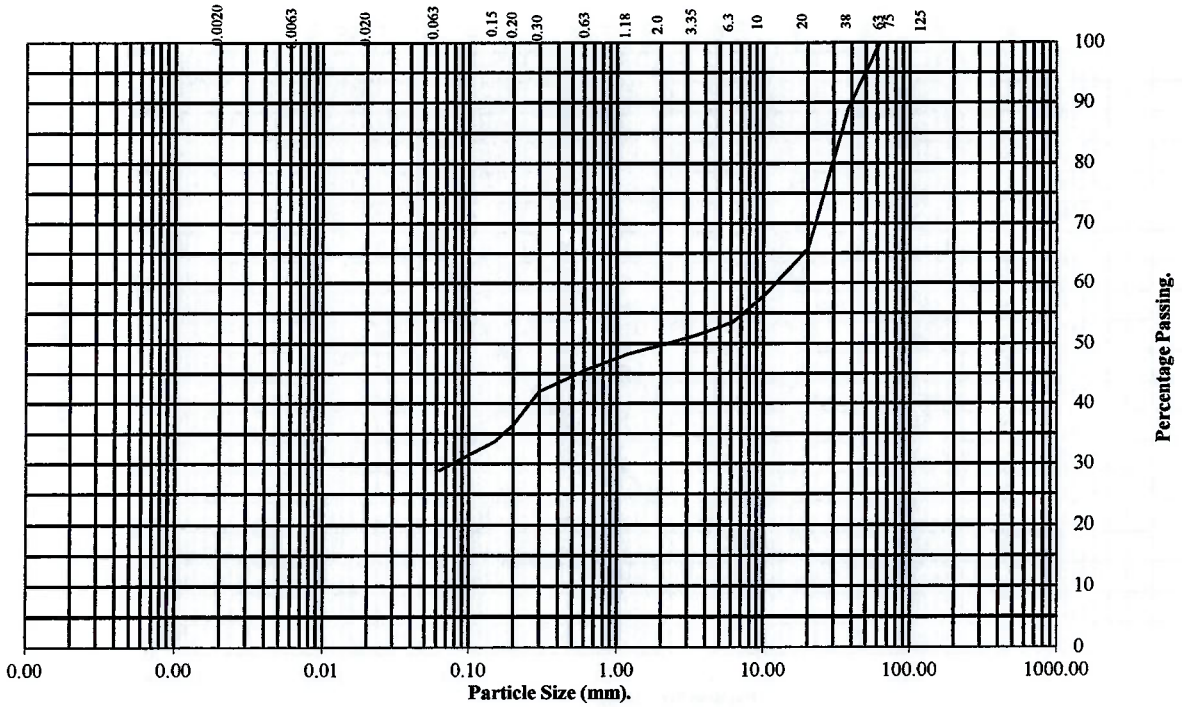
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP04 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	89
20	66
10	58
6.3	54
3.35	51
2	50
1.18	48
0.63	46
0.3	42
0.2	36
0.15	34
0.063	29

Soil Fraction	Total Percentage
Cobbles	0
Gravel	50
Sand	21
Silt/Clay	29

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

PARTICLE SIZE DISTRIBUTION TEST

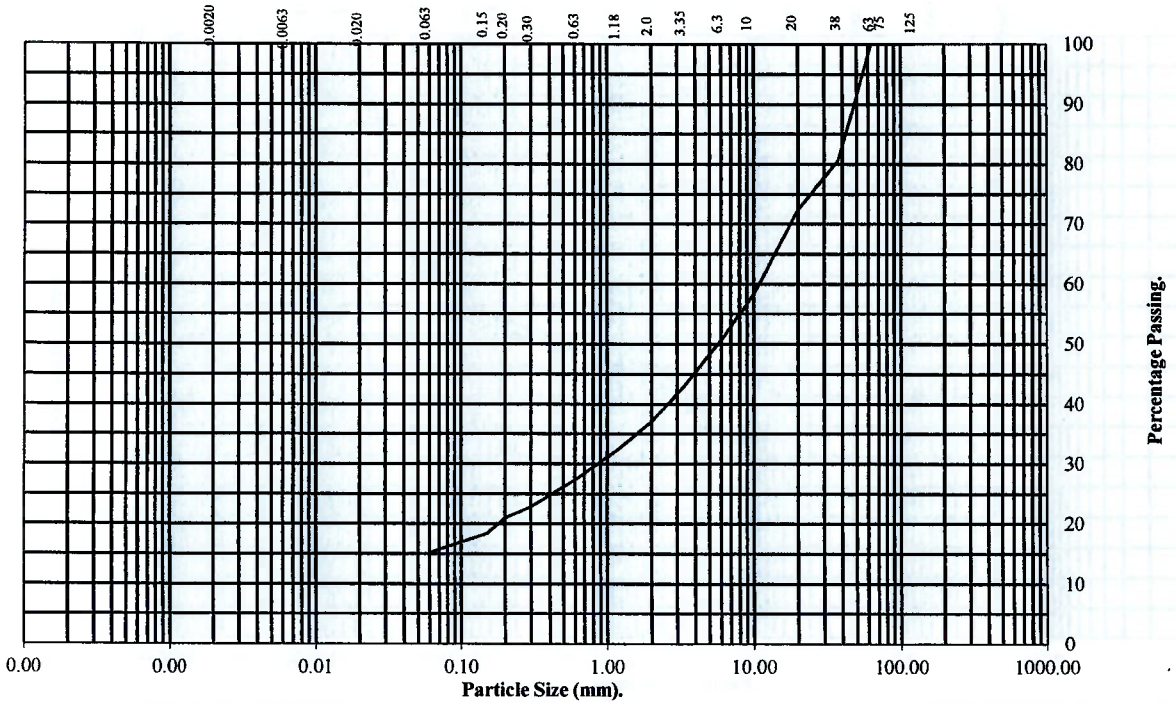
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP05 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	81
20	73
10	58
6.3	51
3.35	43
2	37
1.18	32
0.63	28
0.3	23
0.2	21
0.15	18
0.063	15

Soil Fraction	Total Percentage
Cobbles	0
Gravel	63
Sand	22
Silt/Clay	15

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

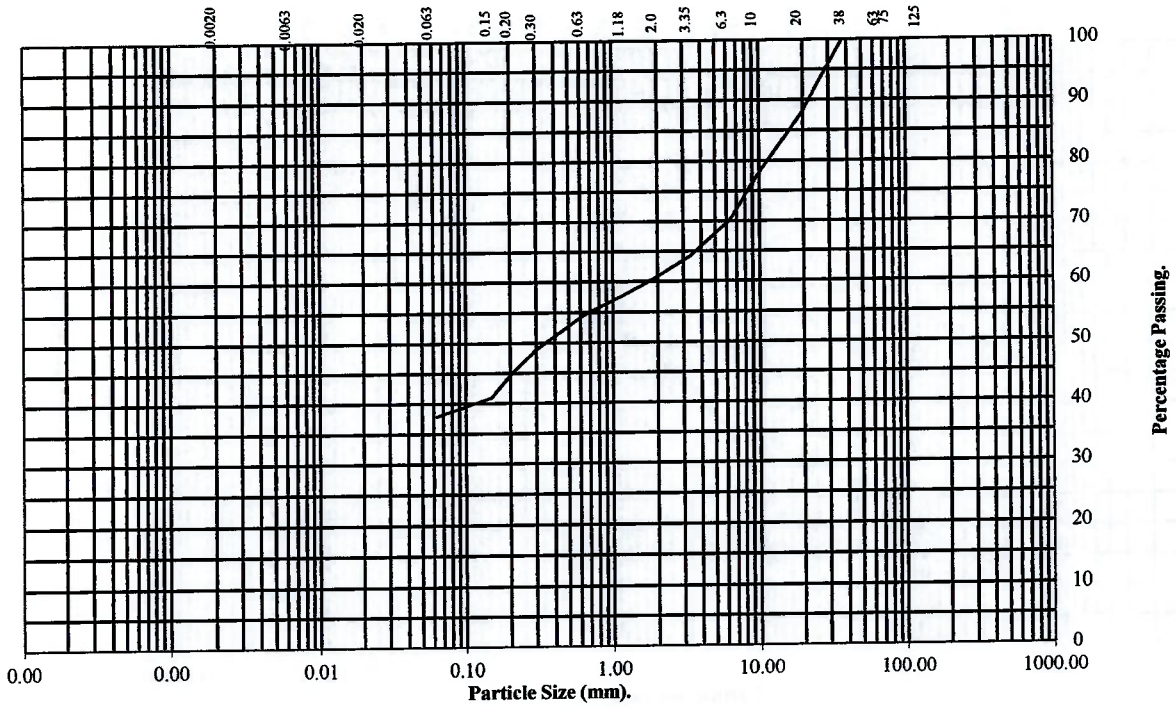
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP06 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	78
6.3	70
3.35	64
2	61
1.18	58
0.63	55
0.3	49
0.2	45
0.15	41
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	39
Sand	23
Silt/Clay	38

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

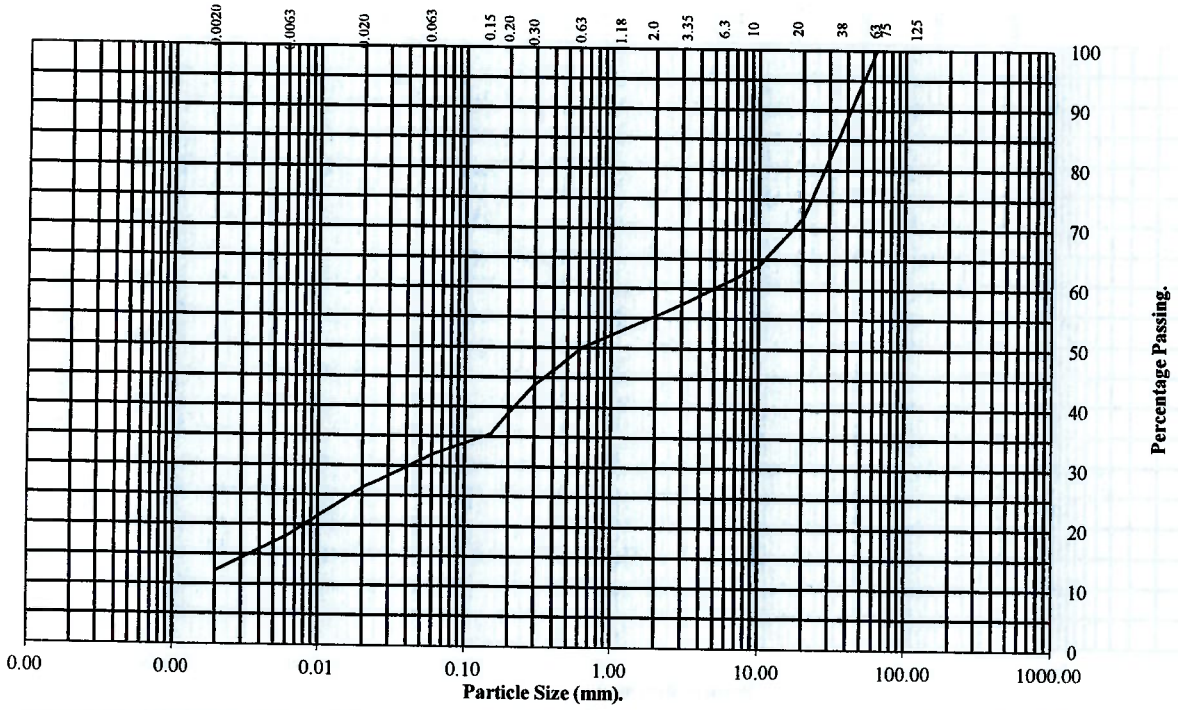
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number: TP07 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	87
20	72
10	64
6.3	61
3.35	58
2	55
1.18	53
0.63	50
0.3	44
0.2	39
0.15	35
0.063	32

Particle Diameter	Percentage Passing
0.020	26
0.0063	18
0.0020	12
Particle Density - 2.65 Mg/m3 assumed	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	45
Sand	23
Silt	20
Clay	12

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

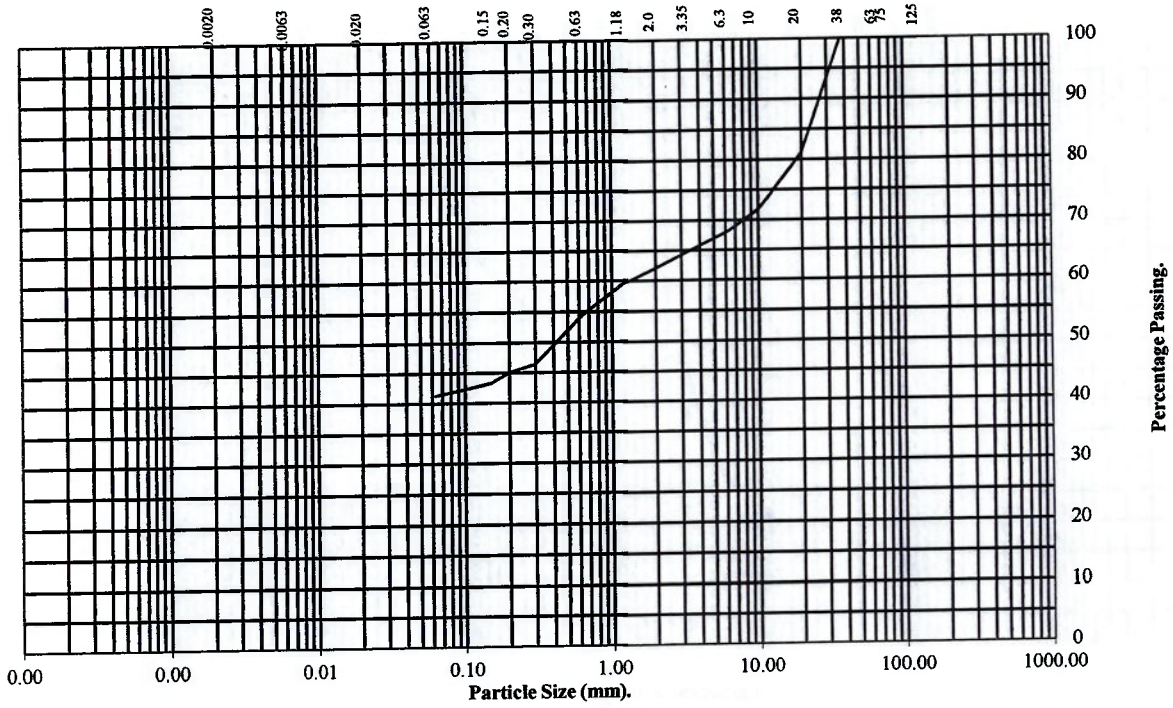
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP08 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	81
10	72
6.3	68
3.35	65
2	62
1.18	59
0.63	54
0.3	46
0.2	45
0.15	43
0.063	41

Soil Fraction	Total Percentage
Cobbles	0
Gravel	38
Sand	21
Silt/Clay	41

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

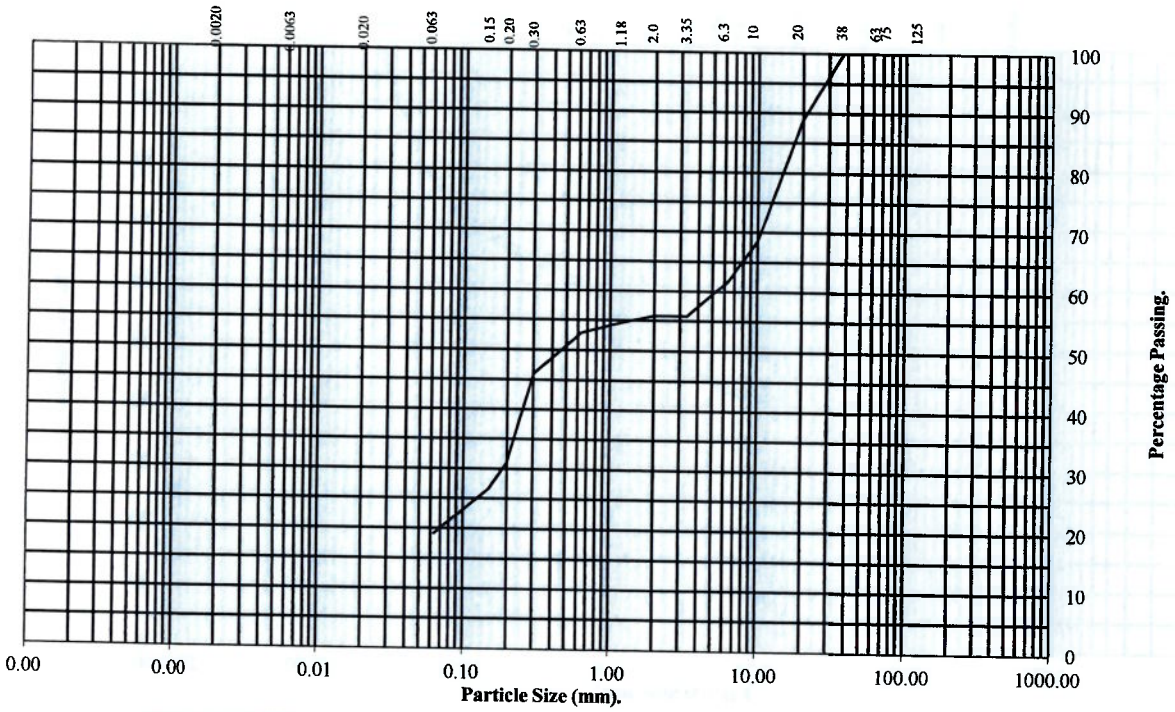
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP10 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	89
10	68
6.3	62
3.35	56
2	56
1.18	55
0.63	53
0.3	46
0.2	31
0.15	27
0.063	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	44
Sand	37
Silt/Clay	19

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

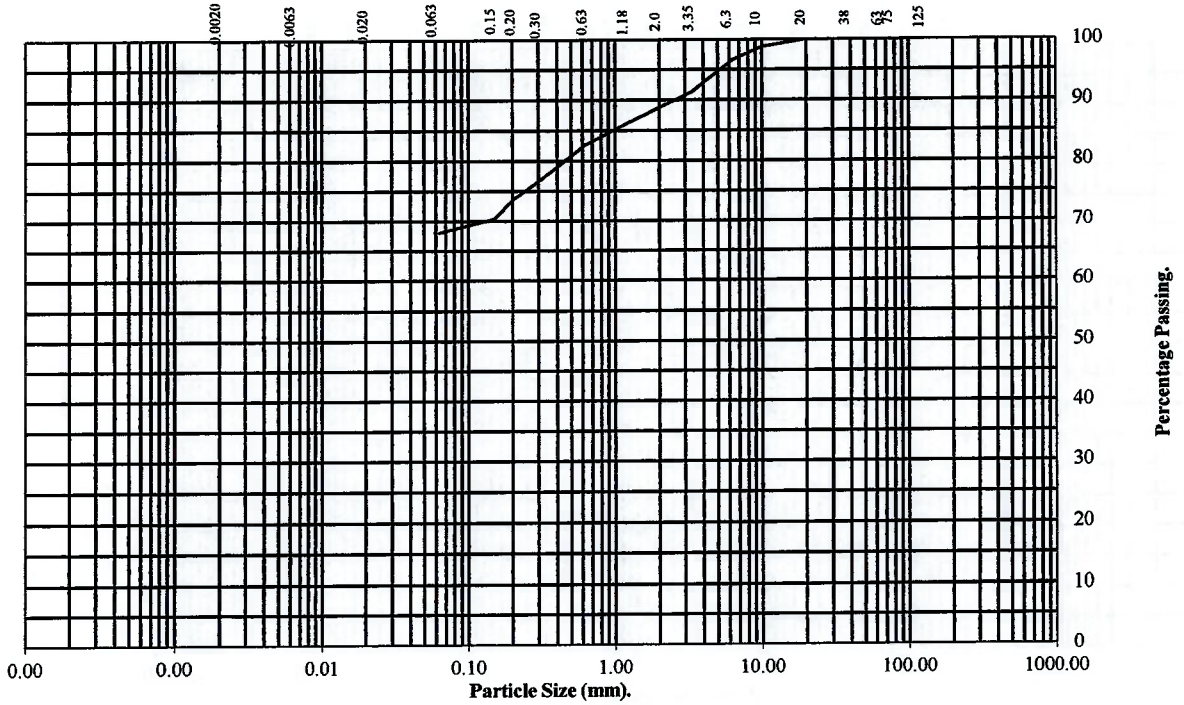
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP12 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	97
3.35	91
2	89
1.18	86
0.63	83
0.3	77
0.2	73
0.15	70
0.063	68

Soil Fraction	Total Percentage
Cobbles	0
Gravel	11
Sand	21
Silt/Clay	68

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

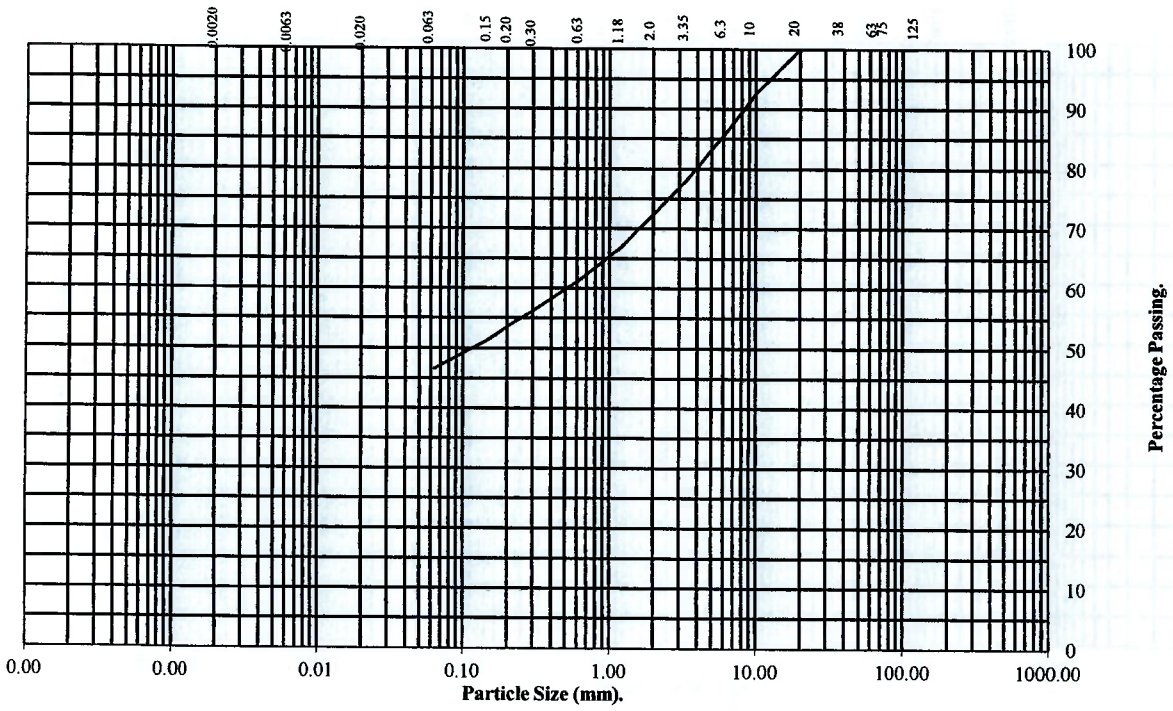
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP13 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	93
6.3	86
3.35	78
2	72
1.18	67
0.63	62
0.3	56
0.2	54
0.15	51
0.063	47

Soil Fraction	Total Percentage
Cobbles	0
Gravel	28
Sand	25
Silt/Clay	47

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

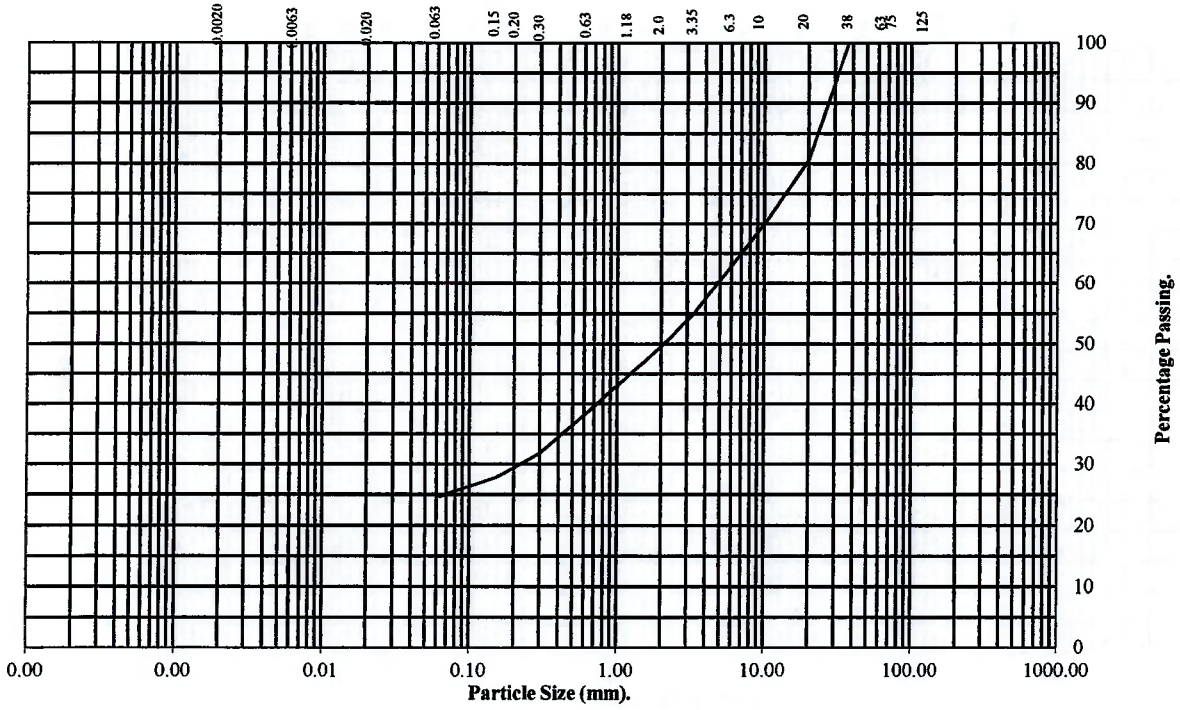
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP16 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	81
10	70
6.3	64
3.35	55
2	50
1.18	45
0.63	39
0.3	32
0.2	29
0.15	28
0.063	25

Soil Fraction	Total Percentage
Cobbles	0
Gravel	50
Sand	25
Silt/Clay	25

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

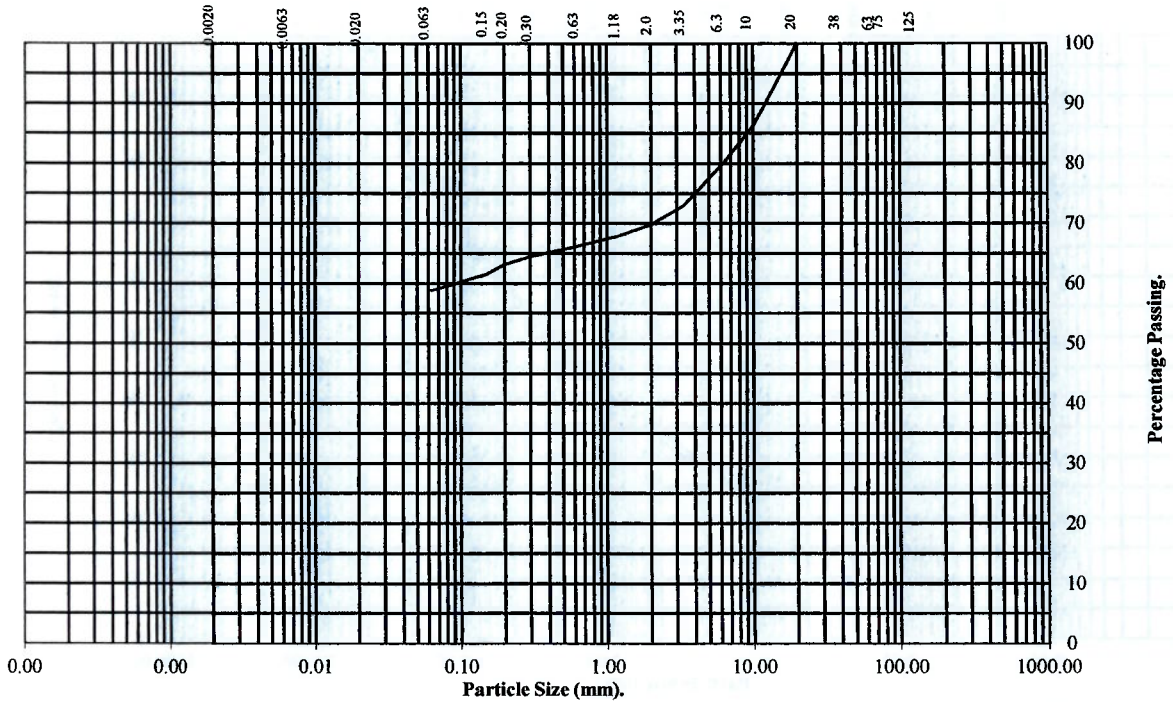
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP19 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	86
6.3	80
3.35	73
2	70
1.18	68
0.63	66
0.3	64
0.2	63
0.15	62
0.063	59

Soil Fraction	Total Percentage
Cobbles	0
Gravel	30
Sand	11
Silt/Clay	59

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

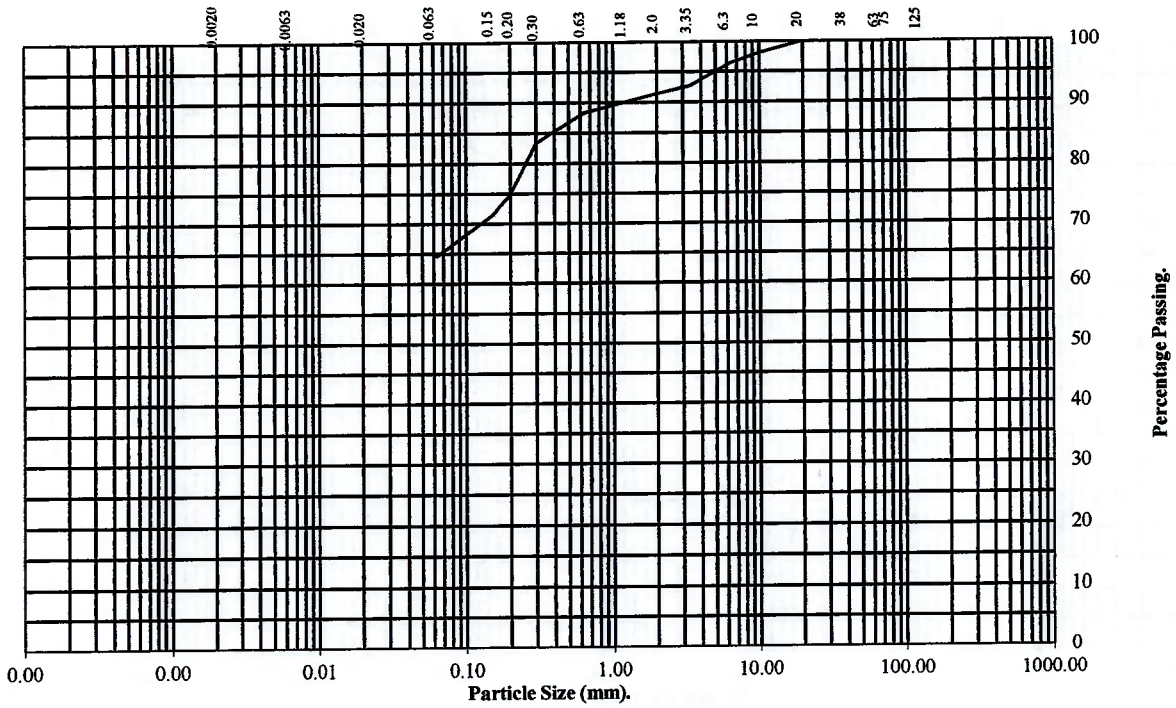
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP22 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	98
6.3	96
3.35	93
2	91
1.18	90
0.63	88
0.3	83
0.2	75
0.15	71
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	9
Sand	26
Silt/Clay	65

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

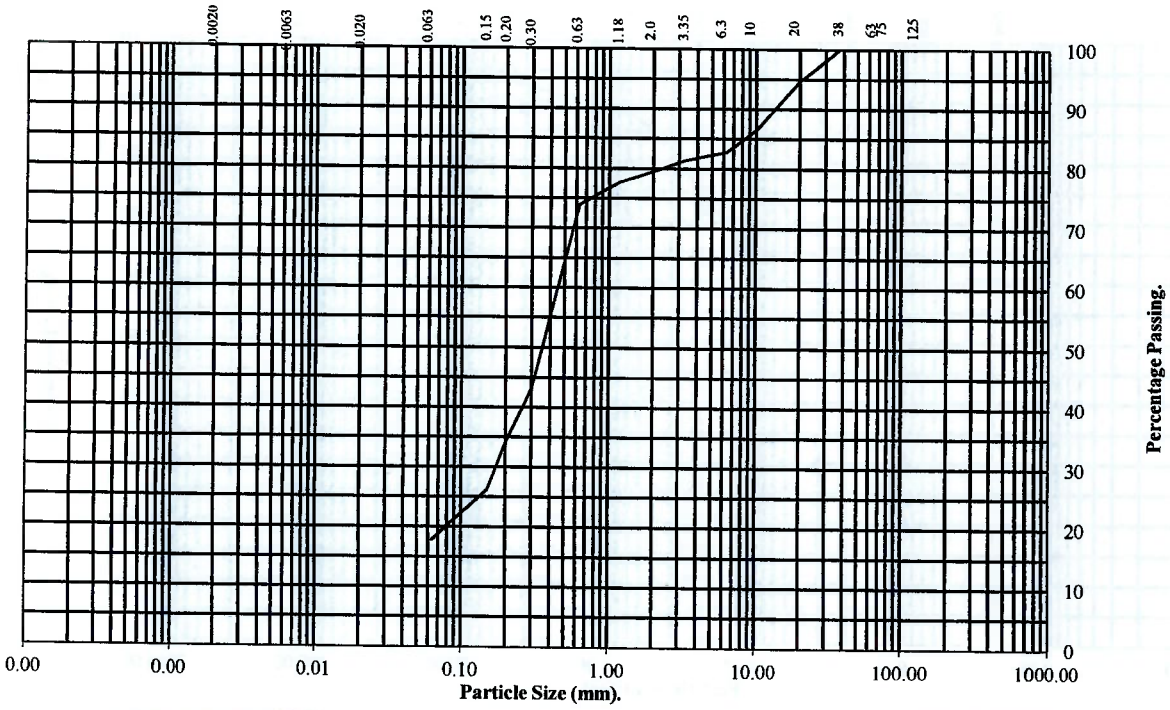
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP22 **Top Depth (m):** 2.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	86
6.3	83
3.35	81
2	79
1.18	78
0.63	74
0.3	43
0.2	34
0.15	26
0.063	18

Soil Fraction	Total Percentage
Cobbles	0
Gravel	21
Sand	61
Silt/Clay	18

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

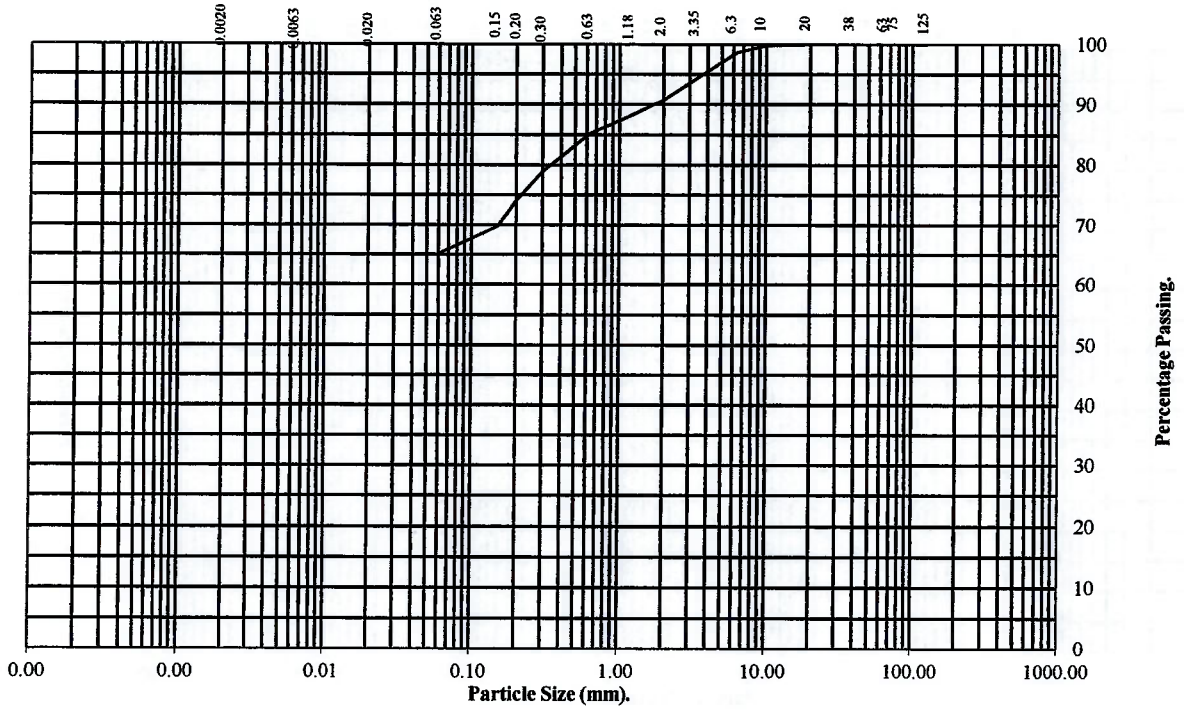
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP24 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	94
2	91
1.18	88
0.63	85
0.3	79
0.2	74
0.15	70
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	9
Sand	26
Silt/Clay	65

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

PARTICLE SIZE DISTRIBUTION TEST

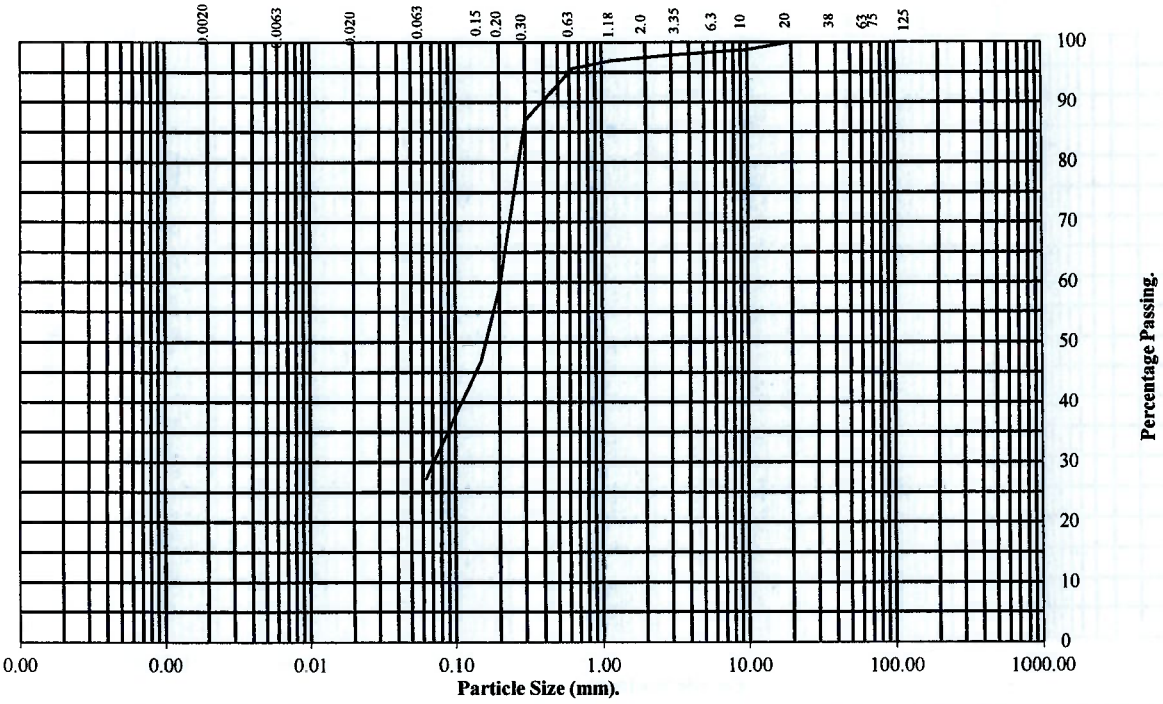
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP26 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	98
2	97
1.18	97
0.63	96
0.3	87
0.2	59
0.15	47
0.063	27

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	70
Silt/Clay	27

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

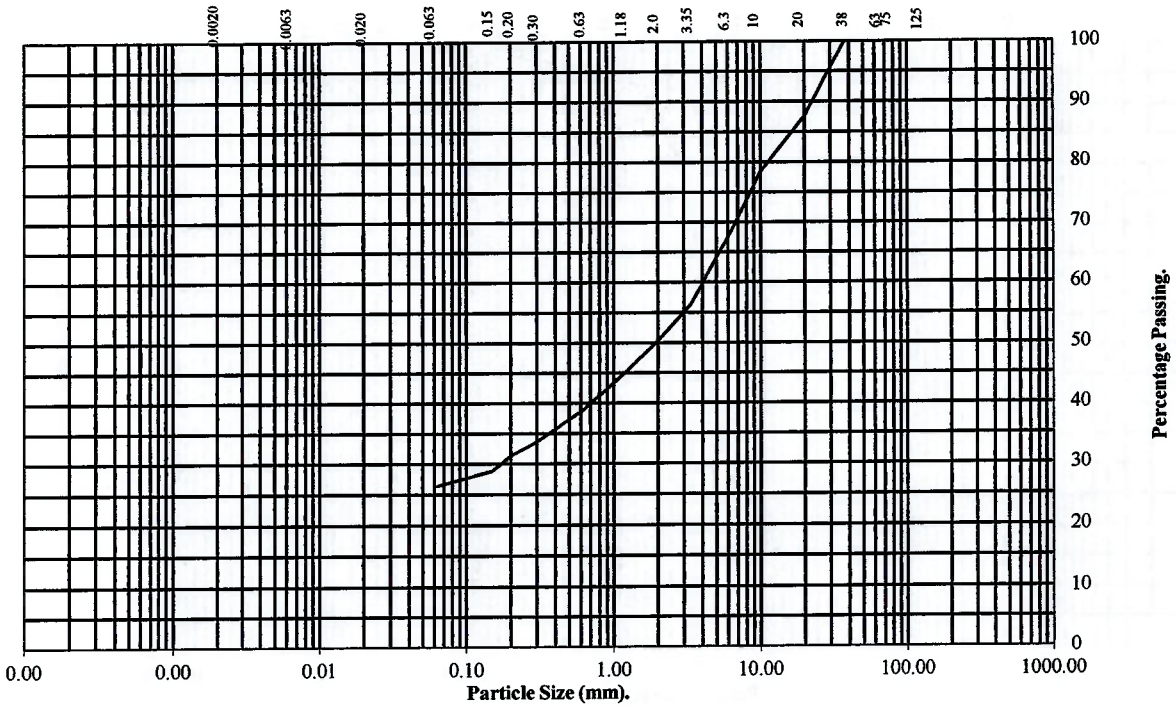
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP29 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	88
10	78
6.3	68
3.35	56
2	50
1.18	45
0.63	39
0.3	34
0.2	31
0.15	29
0.063	26

Soil Fraction	Total Percentage
Cobbles	0
Gravel	50
Sand	24
Silt/Clay	26

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

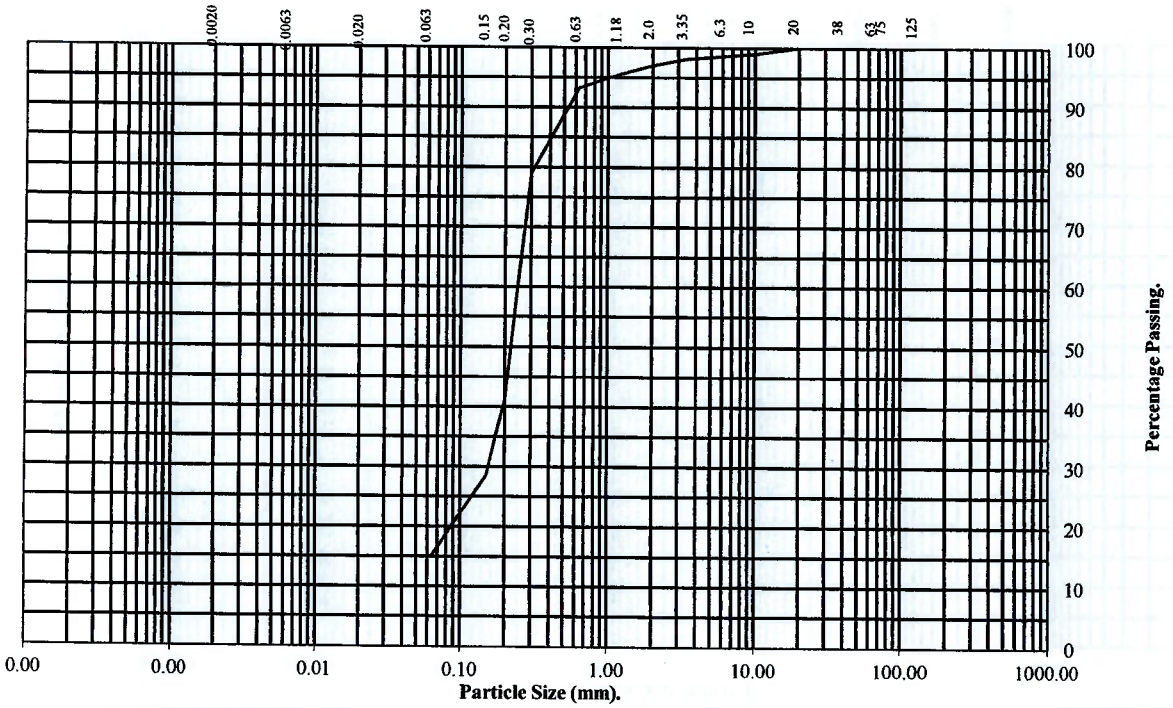
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP31 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	98
2	97
1.18	95
0.63	93
0.3	79
0.2	41
0.15	29
0.063	15

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	82
Silt/Clay	15

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

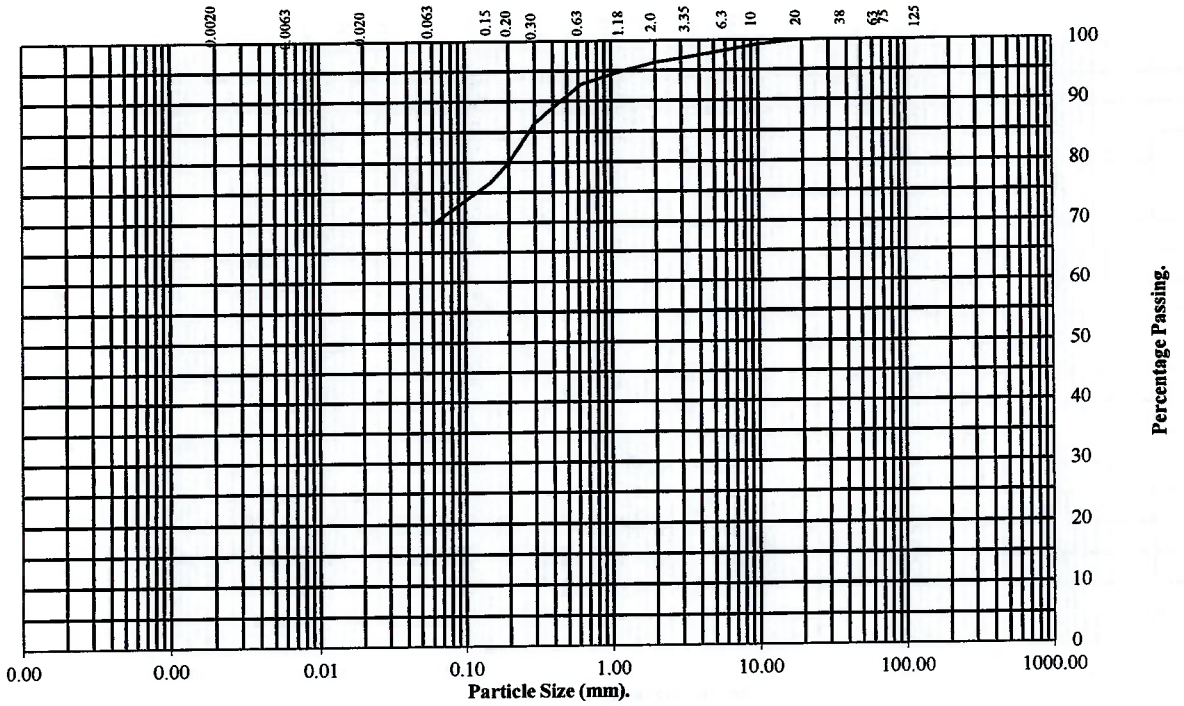
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP33 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	97
2	96
1.18	95
0.63	93
0.3	86
0.2	80
0.15	77
0.063	70

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	26
Silt/Clay	70

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

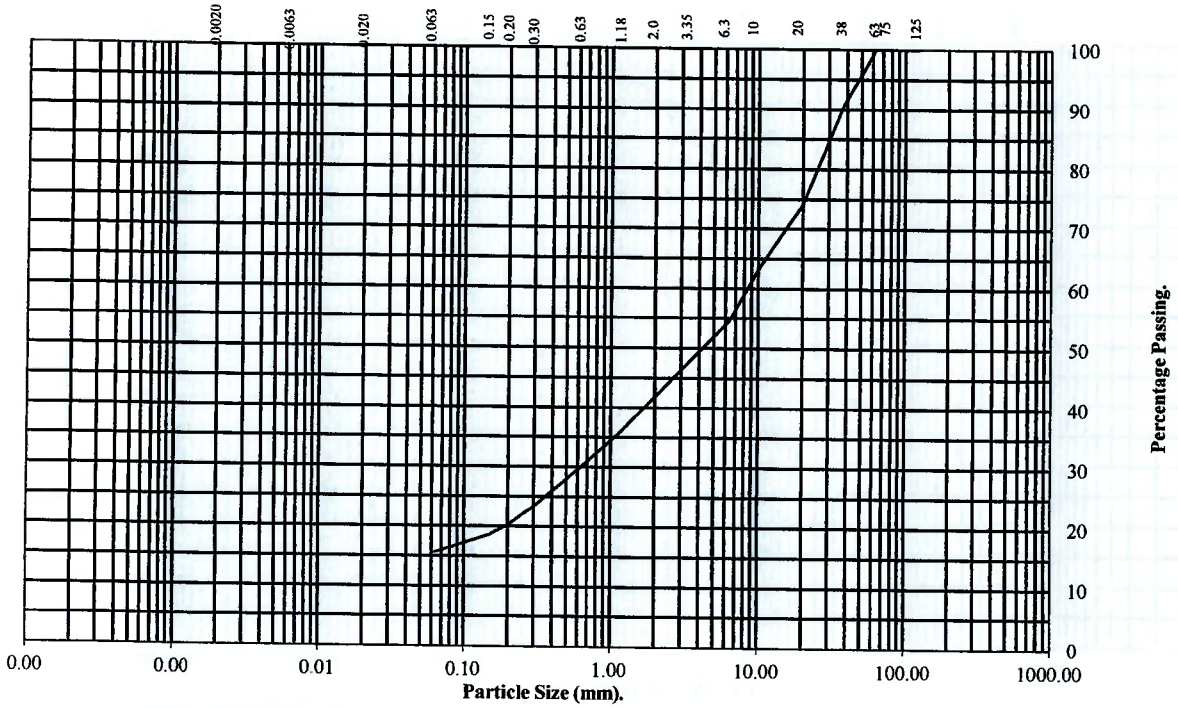
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP34 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	91
20	74
10	63
6.3	54
3.35	48
2	42
1.18	36
0.63	30
0.3	23
0.2	20
0.15	19
0.063	16

Soil Fraction	Total Percentage
Cobbles	0
Gravel	58
Sand	26
Silt/Clay	16

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

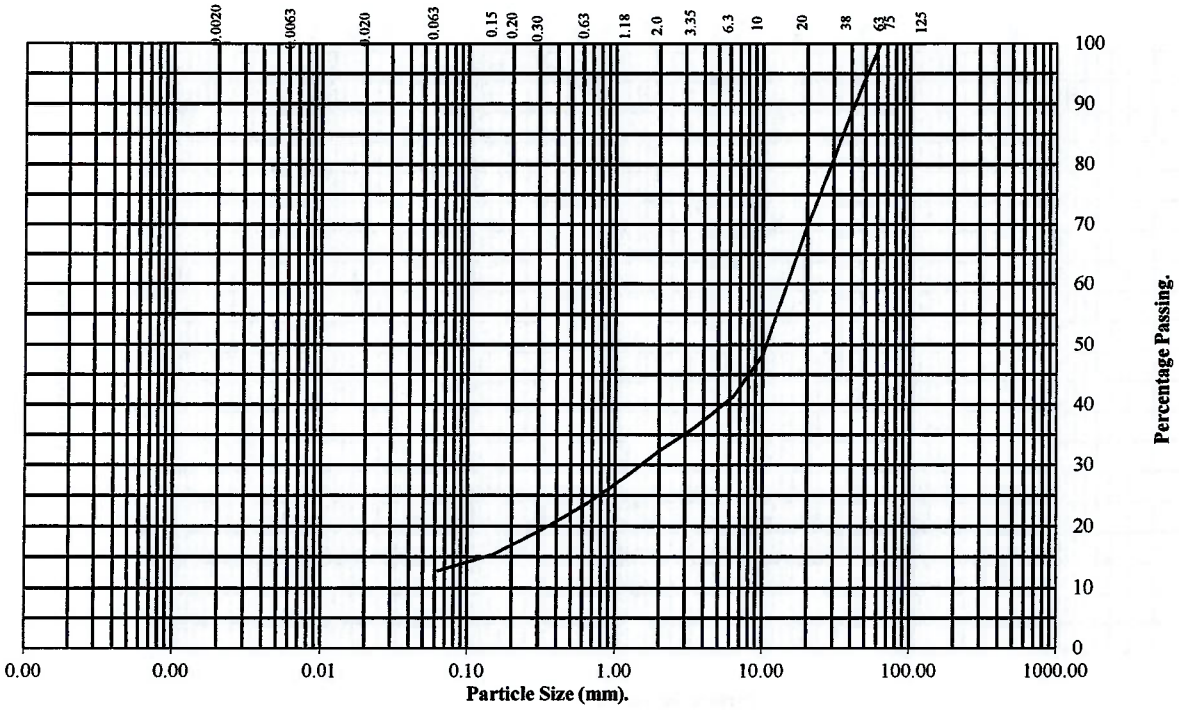
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP35 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	87
20	70
10	48
6.3	41
3.35	36
2	32
1.18	28
0.63	24
0.3	19
0.2	17
0.15	15
0.063	13

Soil Fraction	Total Percentage
Cobbles	0
Gravel	68
Sand	19
Silt/Clay	13

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

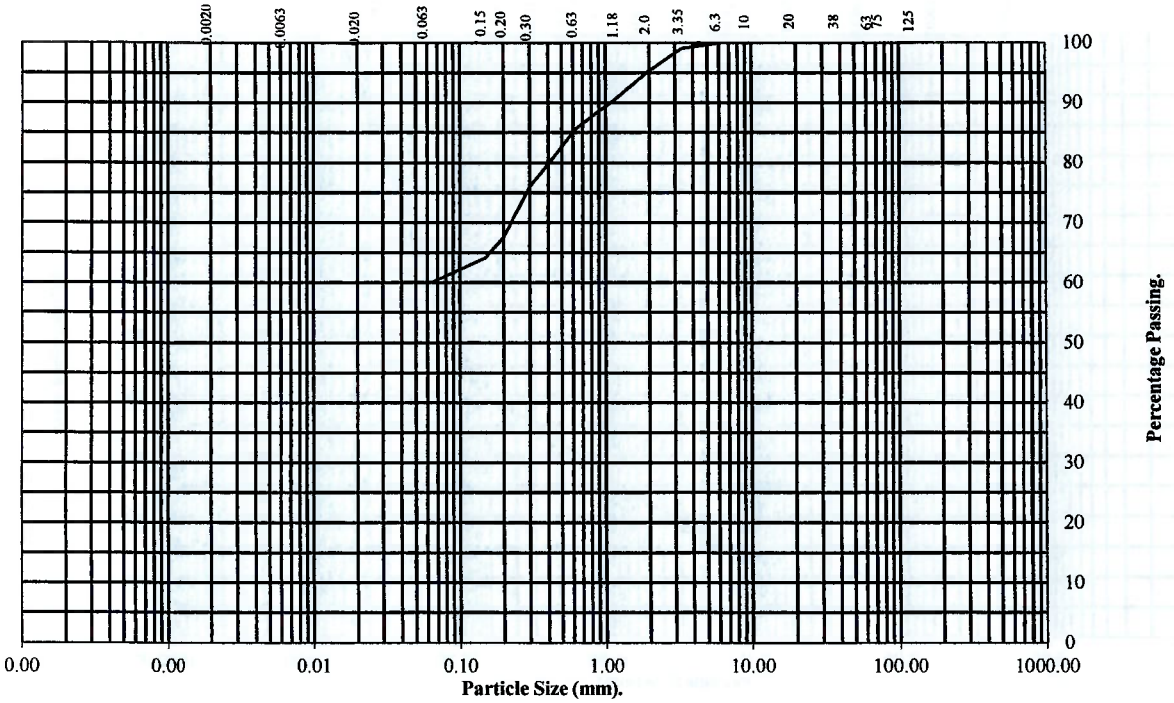
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP38 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	95
1.18	91
0.63	86
0.3	76
0.2	68
0.15	64
0.063	60

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	35
Silt/Clay	60

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

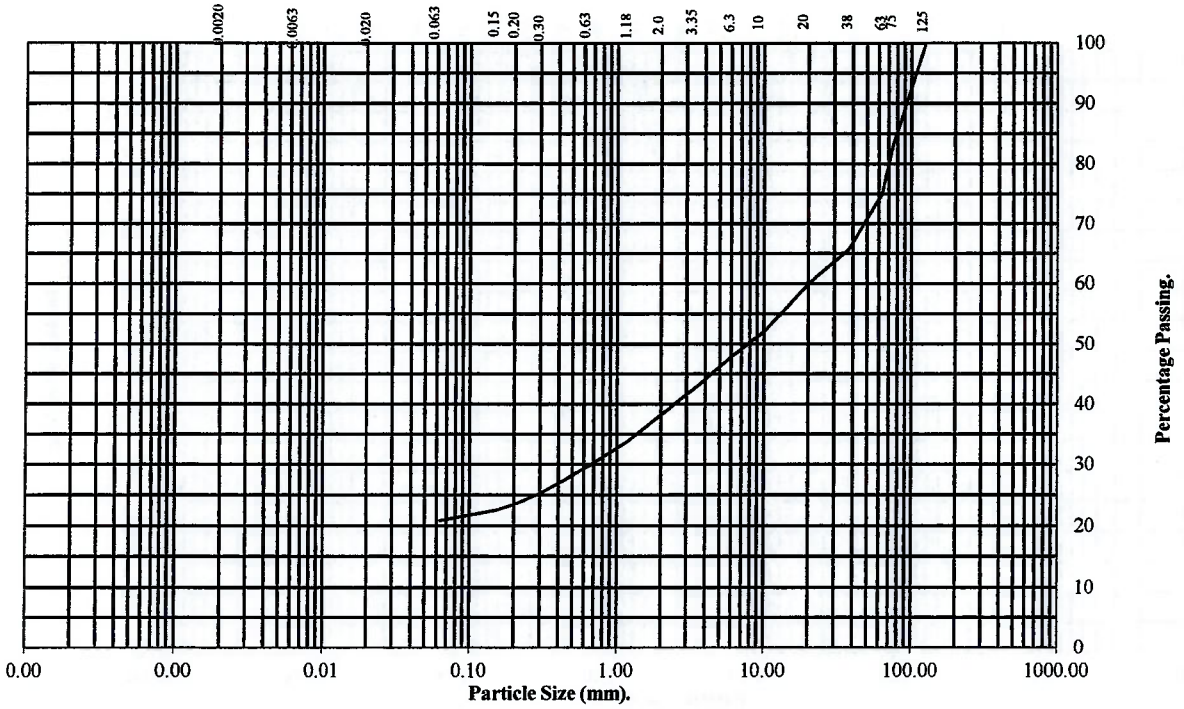
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP09 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	83
63	75
37.5	66
20	60
10	52
6.3	48
3.35	42
2	38
1.18	34
0.63	30
0.3	25
0.2	24
0.15	23
0.063	21

Soil Fraction	Total Percentage
Cobbles	25
Gravel	37
Sand	17
Silt/Clay	21

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

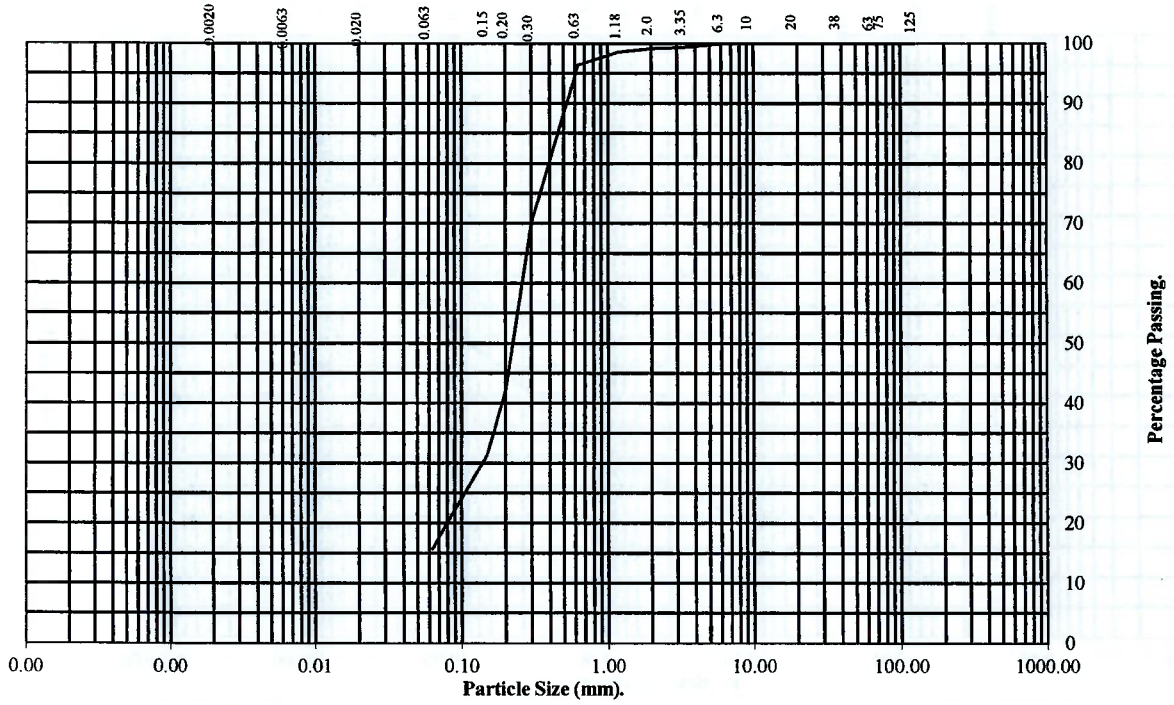
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP10 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	99
1.18	99
0.63	96
0.3	70
0.2	42
0.15	31
0.063	16

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	83
Silt/Clay	16

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

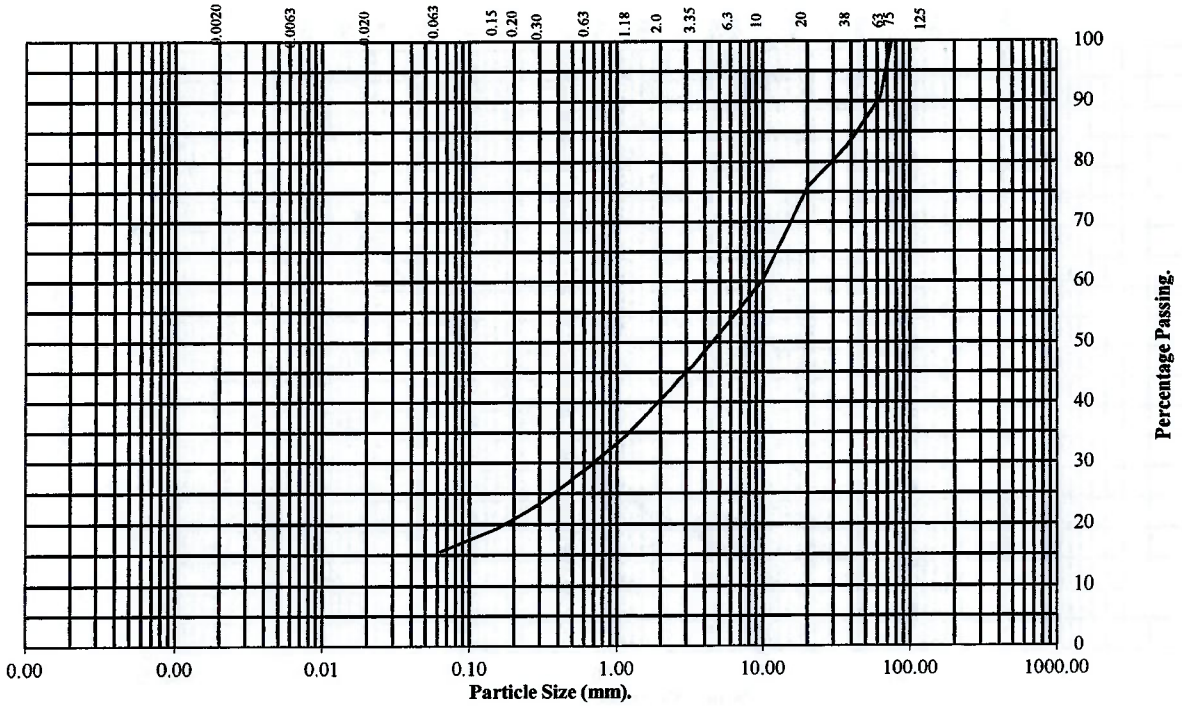
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP11 **Top Depth (m):** 2.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	91
37.5	83
20	76
10	60
6.3	54
3.35	46
2	40
1.18	35
0.63	29
0.3	23
0.2	21
0.15	19
0.063	16

Soil Fraction	Total Percentage
Cobbles	9
Gravel	51
Sand	24
Silt/Clay	16

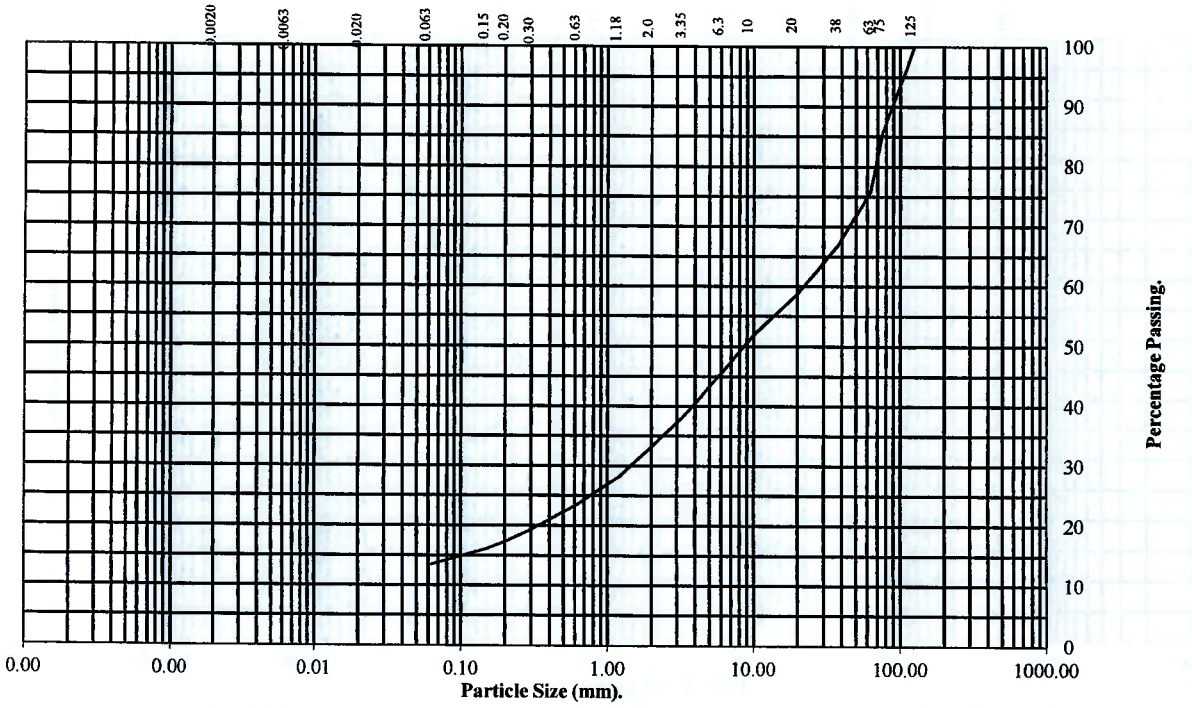
Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number:	**TP13**	**Top Depth (m):**	**2.50**
Sample Number:		**Base Depth (m):**	
Sample Type:	**B&D**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	85
63	76
37.5	67
20	59
10	52
6.3	46
3.35	38
2	33
1.18	28
0.63	24
0.3	19
0.2	17
0.15	16
0.063	14

Soil Fraction	Total Percentage
Cobbles	24
Gravel	43
Sand	19
Silt/Clay	14

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

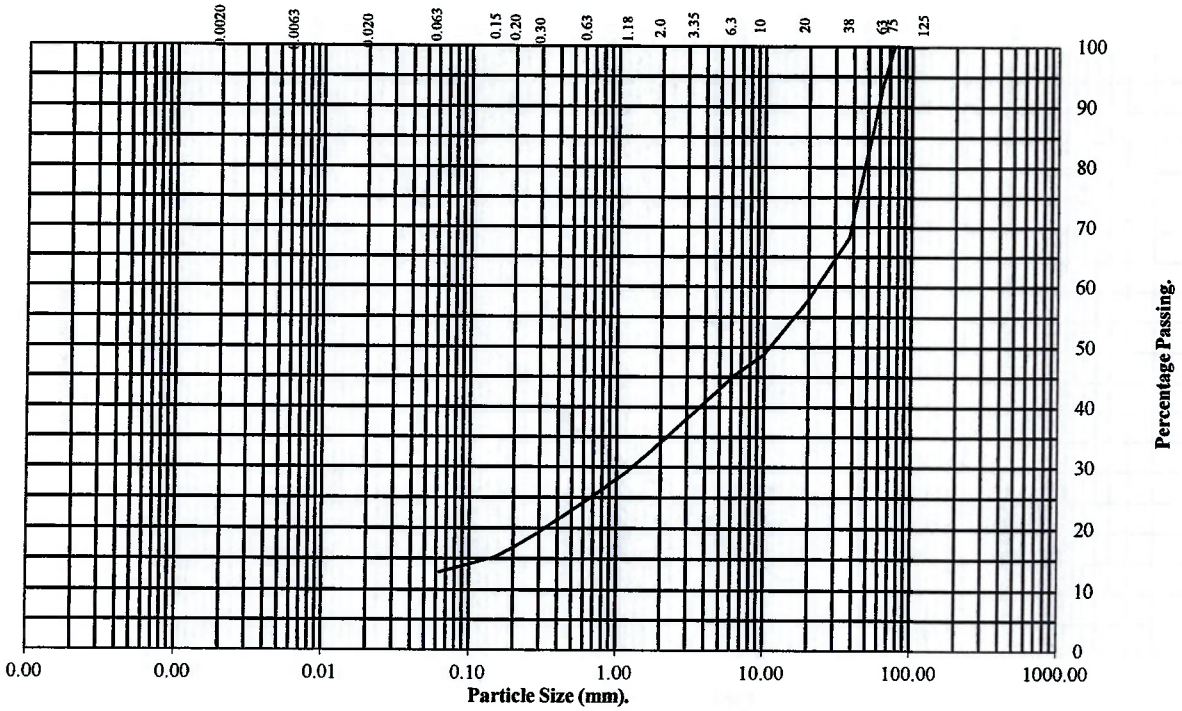
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP20 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	94
37.5	68
20	58
10	49
6.3	45
3.35	39
2	34
1.18	29
0.63	25
0.3	19
0.2	17
0.15	15
0.063	13

Soil Fraction	Total Percentage
Cobbles	6
Gravel	60
Sand	21
Silt/Clay	13

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

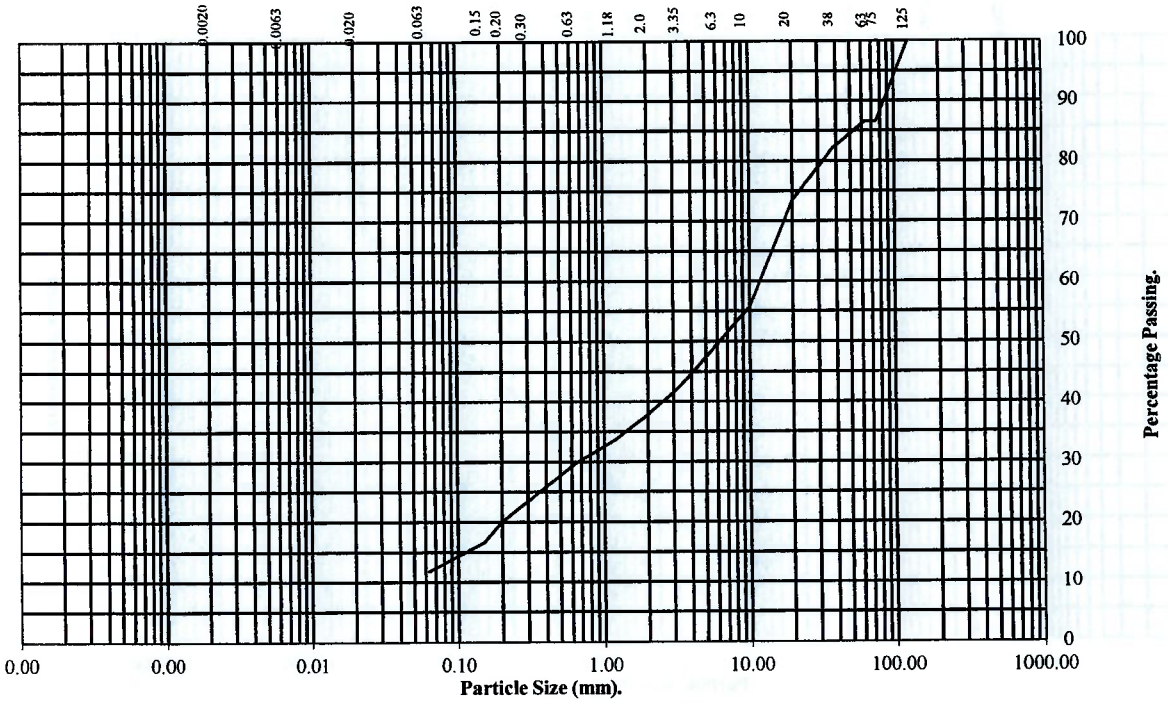
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP26 **Top Depth (m):** 2.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	87
63	87
37.5	82
20	73
10	56
6.3	50
3.35	43
2	38
1.18	34
0.63	30
0.3	23
0.2	20
0.15	17
0.063	12

Soil Fraction	Total Percentage
Cobbles	13
Gravel	49
Sand	26
Silt/Clay	12

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

PARTICLE SIZE DISTRIBUTION TEST

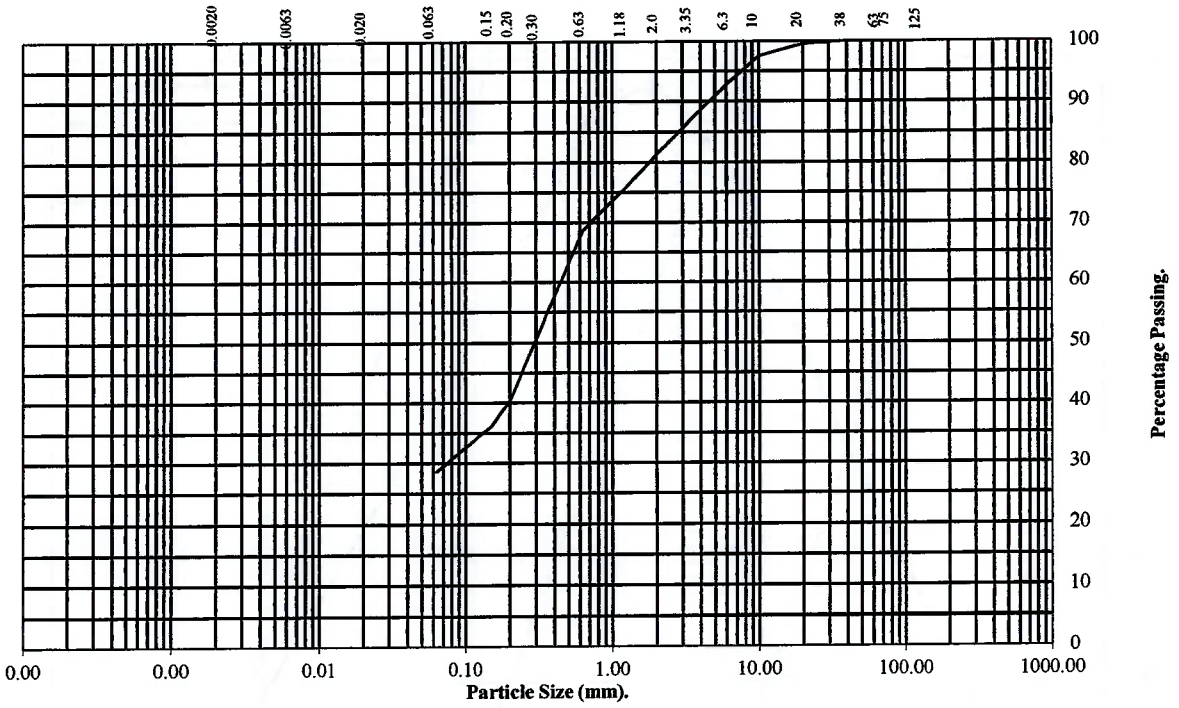
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2

Hole Number: TP36 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	93
3.35	87
2	81
1.18	75
0.63	69
0.3	51
0.2	40
0.15	36
0.063	29

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	52
Silt/Clay	29

Remarks:
See Summary of Soil Descriptions

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

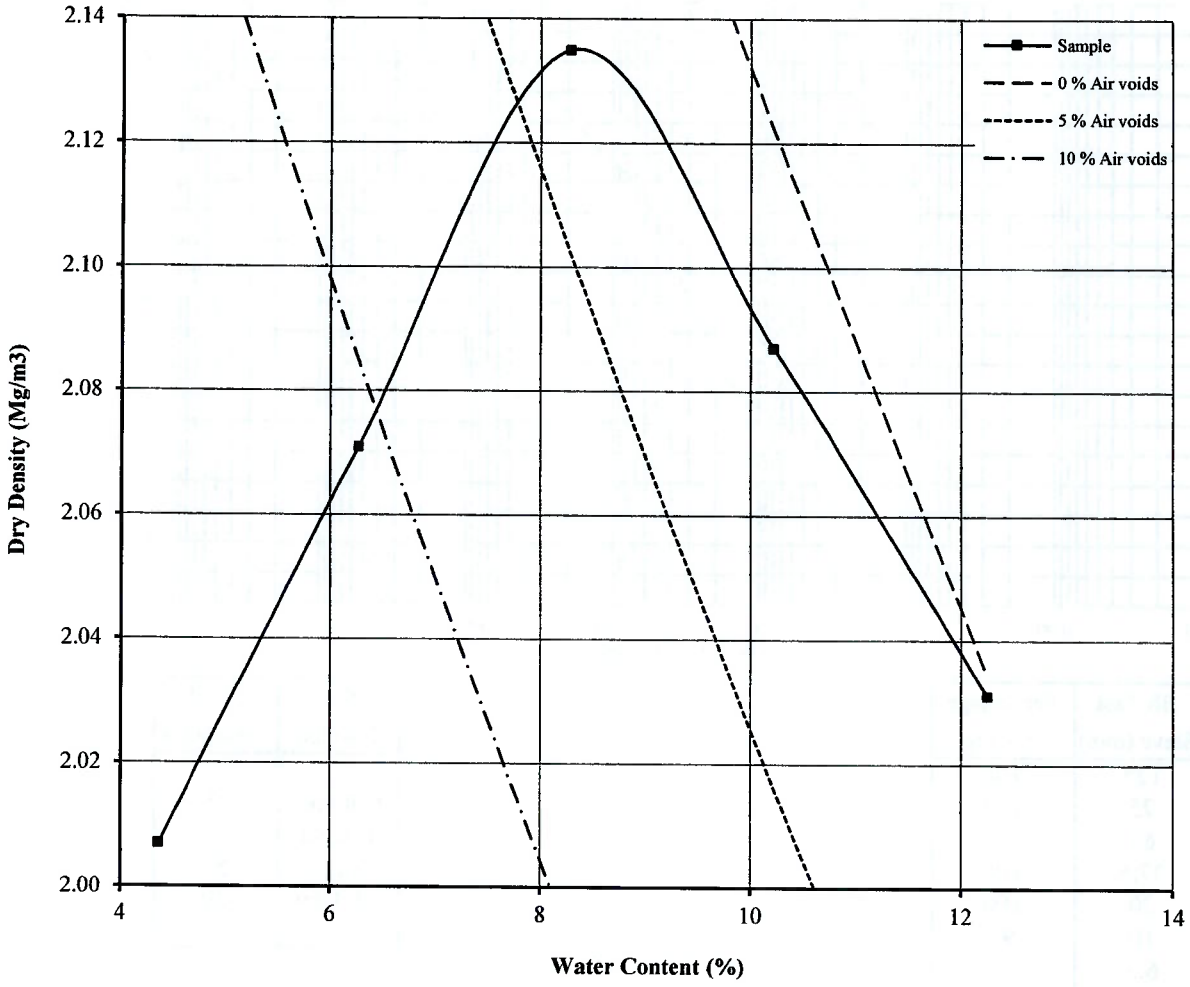
DRY DENSITY/WATER CONTENT RELATIONSHIP

Non compliance with BS 1377 - Part 2 : Clause 11 : 2022

Hole Number: TP01 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Water Content:		10.2	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.71	Assumed	Material Retained on 37.5 mm Test Sieve (%):		29
Maximum Dry Density (Mg/m3):		2.14	Material Retained on 20.0 mm Test Sieve (%):		26
Optimum Water Content (%):		8	Grading Zone:		X
Remarks See summary of soil descriptions					

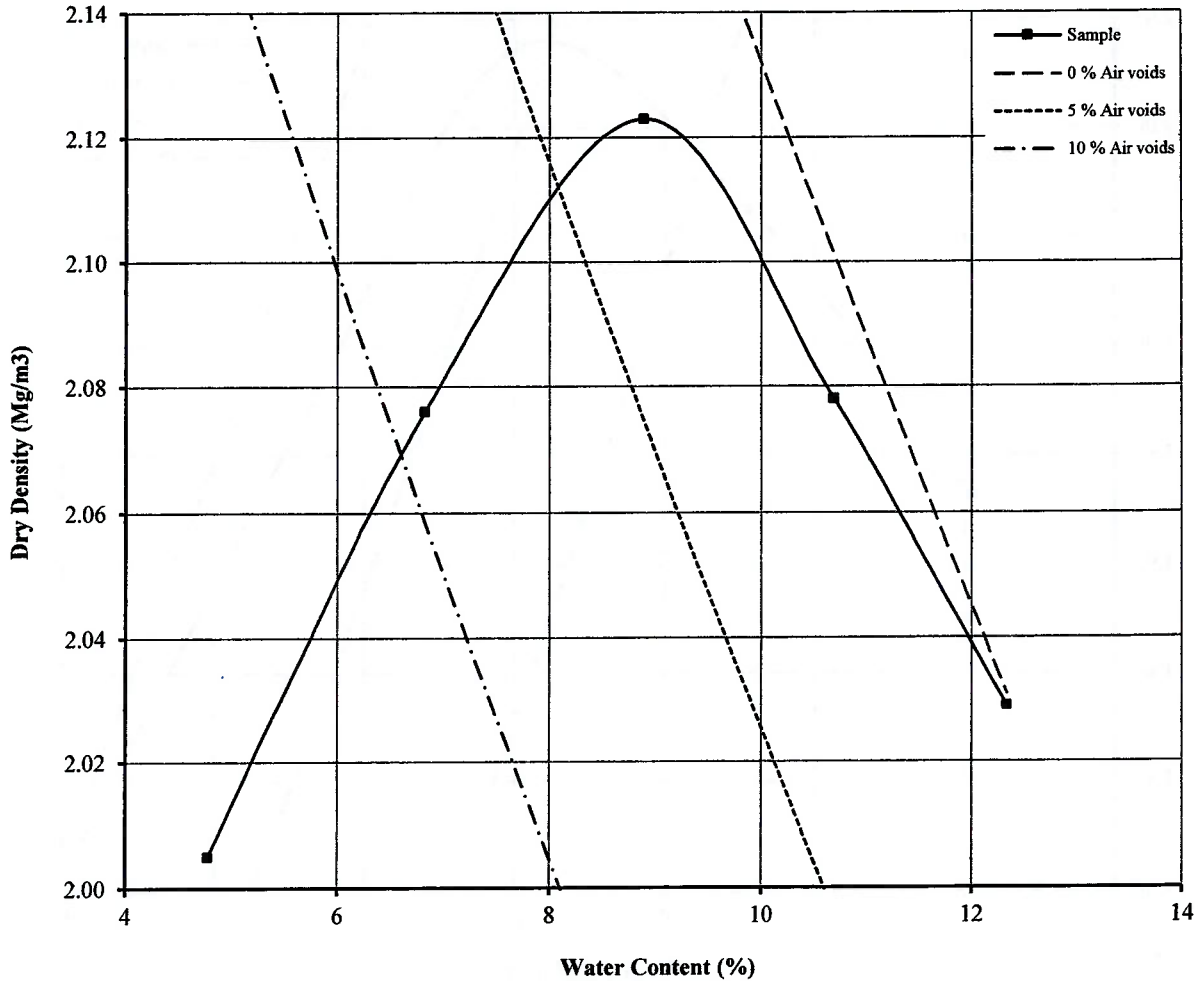
DRY DENSITY/WATER CONTENT RELATIONSHIP

Non compliance with BS 1377 - Part 2 : Clause 11 : 2022

Hole Number: TP05 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Water Content:		8.9	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.71	Assumed	Material Retained on 37.5 mm Test Sieve (%):		19
Maximum Dry Density (Mg/m3):		2.12	Material Retained on 20.0 mm Test Sieve (%):		8
Optimum Water Content (%):		9	Grading Zone:		X
Remarks See summary of soil descriptions					

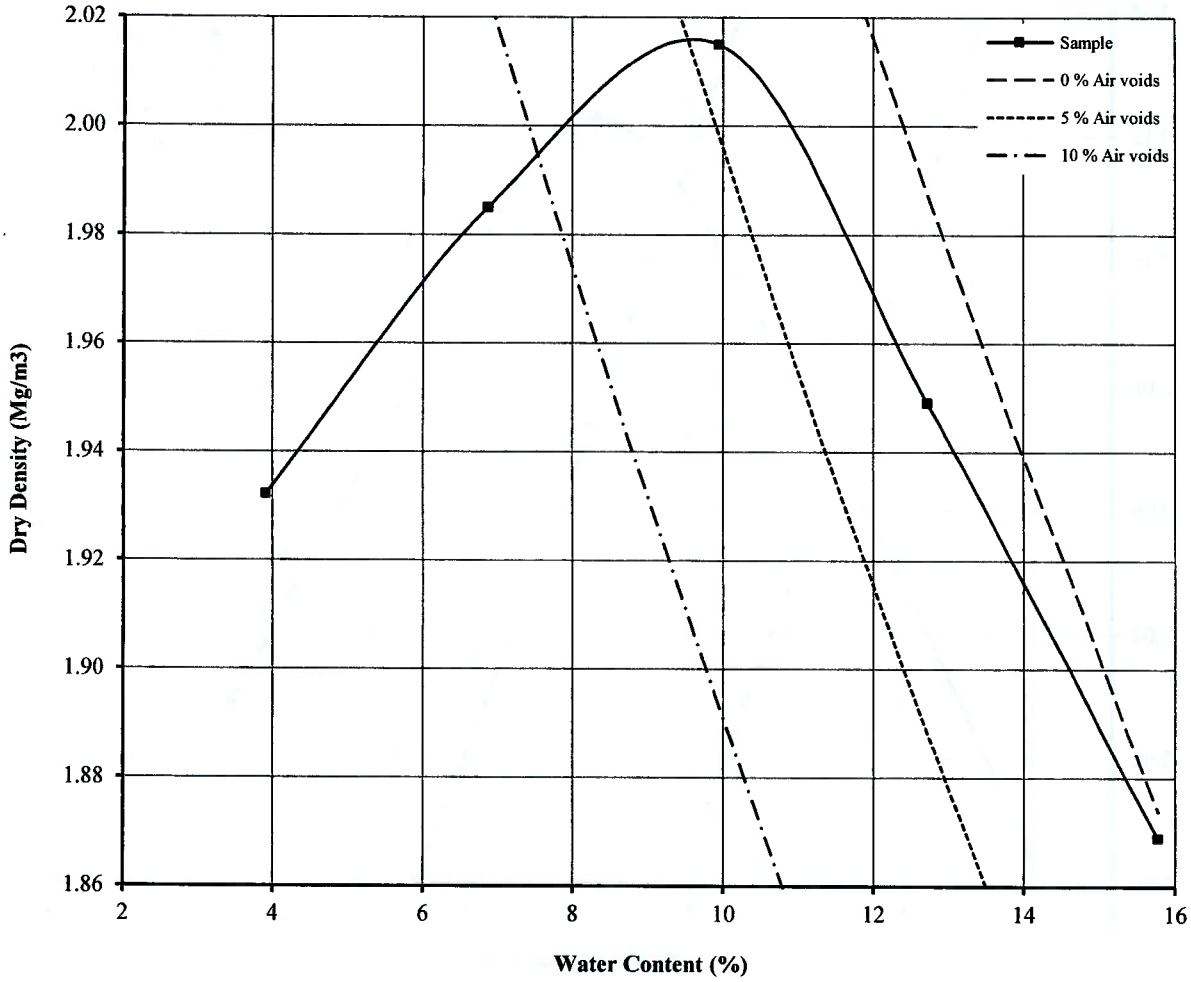
DRY DENSITY/WATER CONTENT RELATIONSHIP

BS 1377 - Part 2 : Clause 11 : 2022

Hole Number: TP13 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Water Content:		12.7	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		2.02	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Water Content (%):		10	Grading Zone:		1
Remarks See summary of soil descriptions					

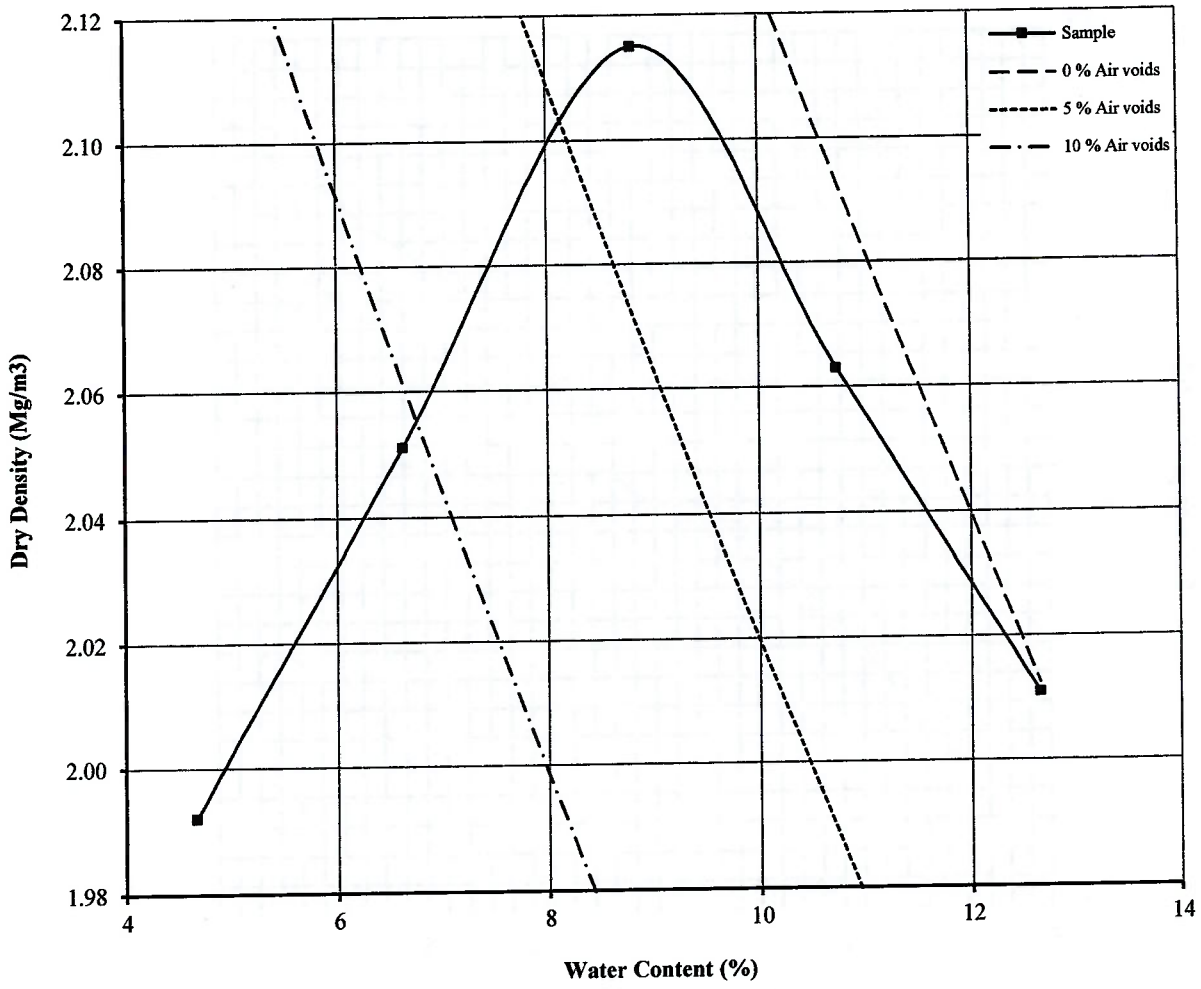
DRY DENSITY/WATER CONTENT RELATIONSHIP

Non compliance with BS 1377 - Part 2 : Clause 11 : 2022

Hole Number: TP35 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Water Content:		8.8	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.70	Assumed	Material Retained on 37.5 mm Test Sieve (%):		13
Maximum Dry Density (Mg/m3):		2.12	Material Retained on 20.0 mm Test Sieve (%):		17
Optimum Water Content (%):		9	Grading Zone:		X
Remarks See summary of soil descriptions					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No.
PSL24/7255
Client Ref
13999-07-24

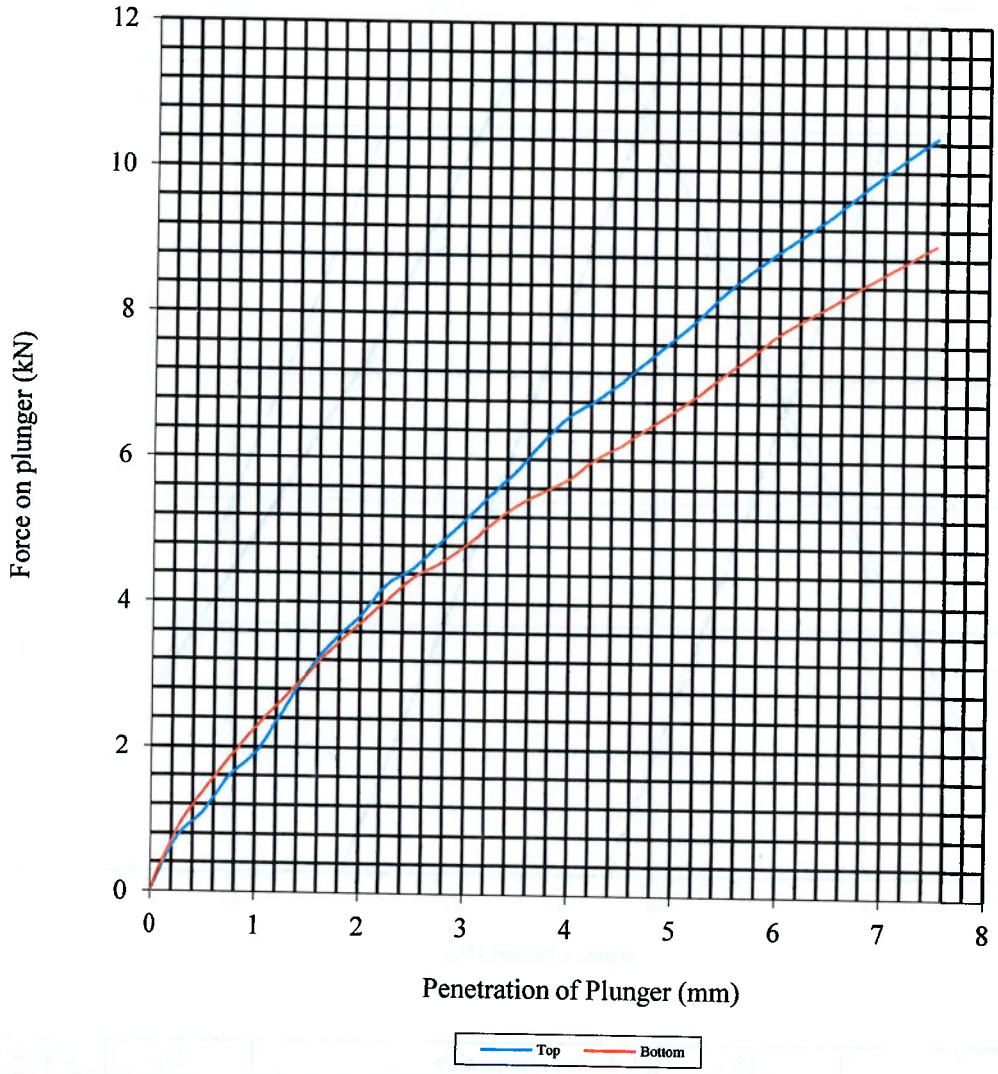
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: TP01 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	13.2	Surcharge Kg:	4.00	Sample Top	13.2	Sample Top	38.4
Bulk Density Mg/m3:	2.10	Soaking Time hrs	0	Sample Bottom	13.4	Sample Bottom	33.4
Dry Density Mg/m3:	1.86	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

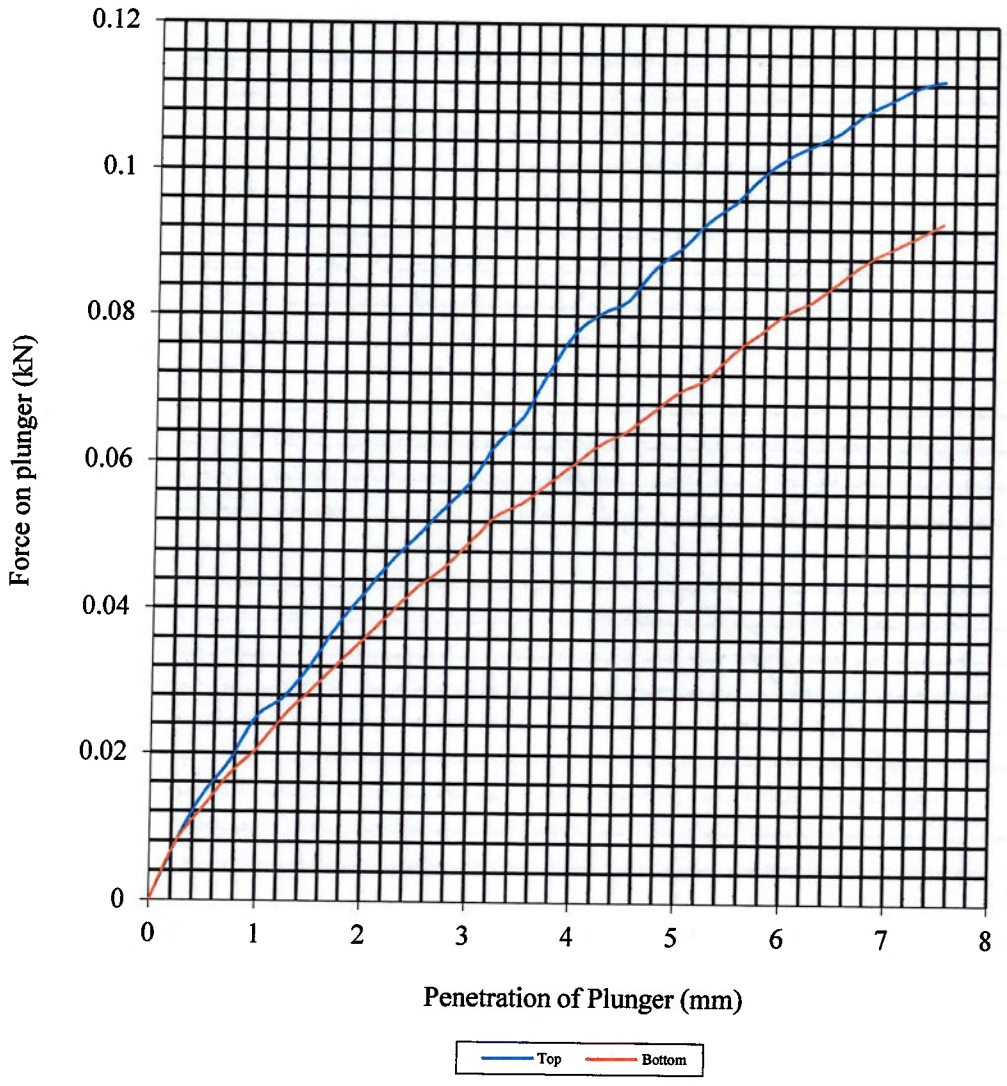
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: TP06 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	17.4	Surcharge Kg:	4.00	Sample Top	17.5	Sample Top	0.4
Bulk Density Mg/m3:	2.15	Soaking Time hrs	0	Sample Bottom	17.7	Sample Bottom	0.3
Dry Density Mg/m3:	1.83	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			12				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

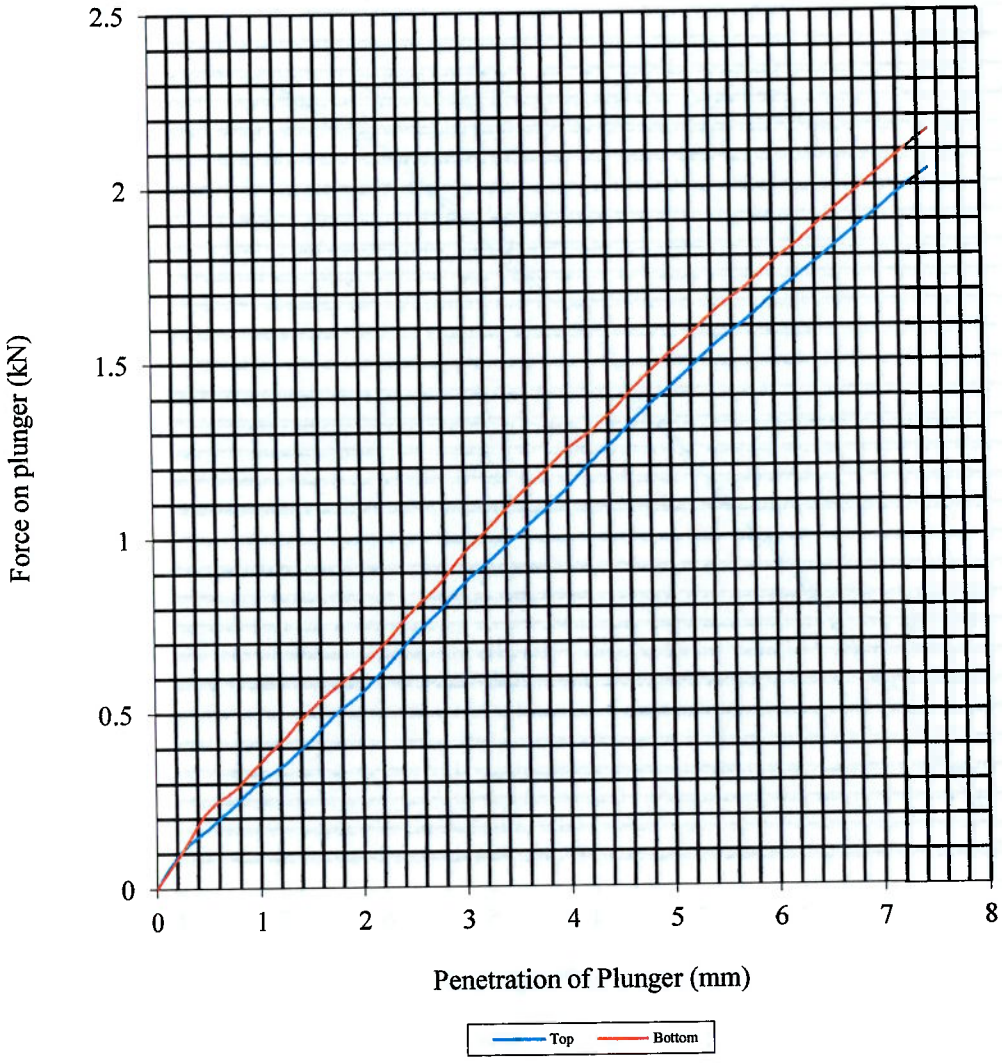
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: TP12 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	20.4	Surcharge Kg:	4.00	Sample Top	20.3	Sample Top	7.1
Bulk Density Mg/m3:	2.03	Soaking Time hrs	0	Sample Bottom	20.8	Sample Bottom	7.6
Dry Density Mg/m3:	1.69	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

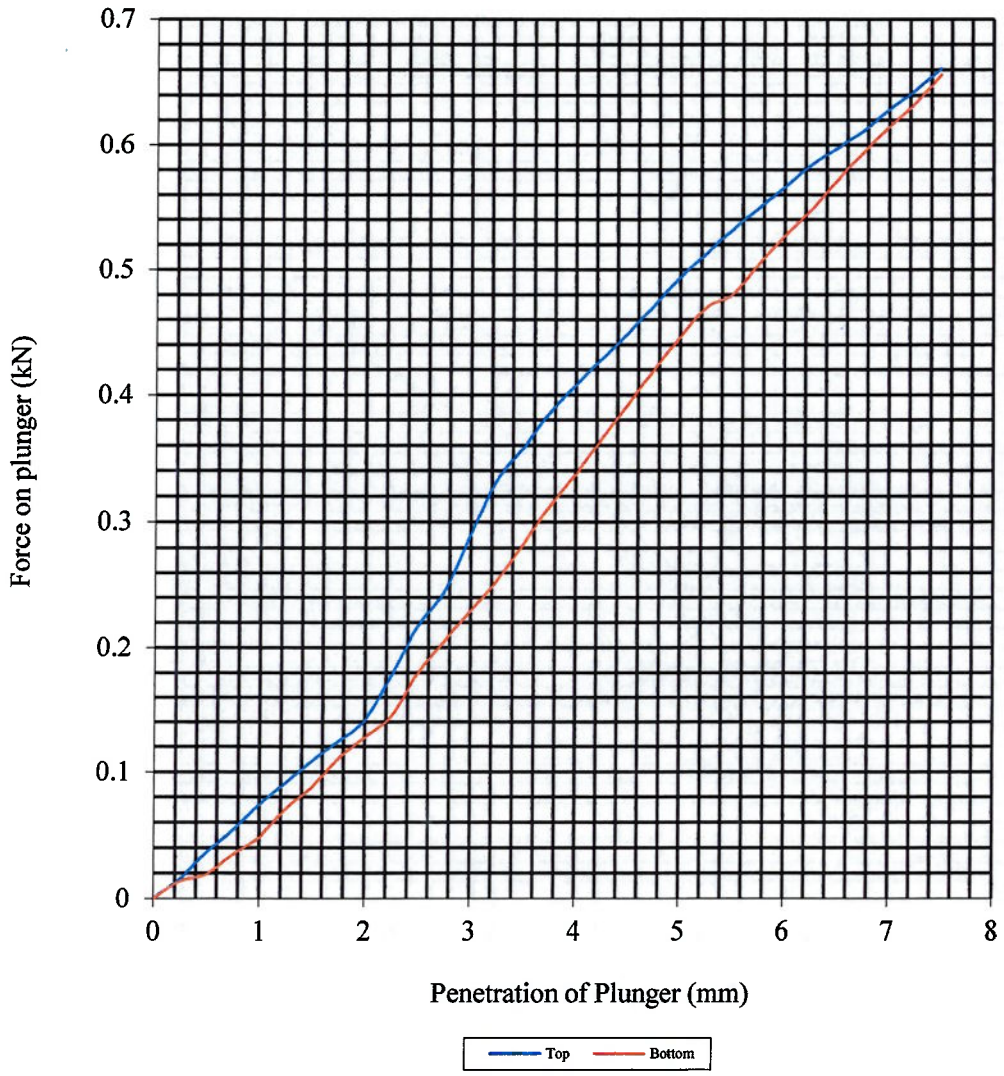
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: TP19 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	18.9	Surcharge Kg:	4.00	Sample Top	18.7	Sample Top	2.5
Bulk Density Mg/m3:	2.13	Soaking Time hrs	0	Sample Bottom	19.2	Sample Bottom	2.2
Dry Density Mg/m3:	1.79	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

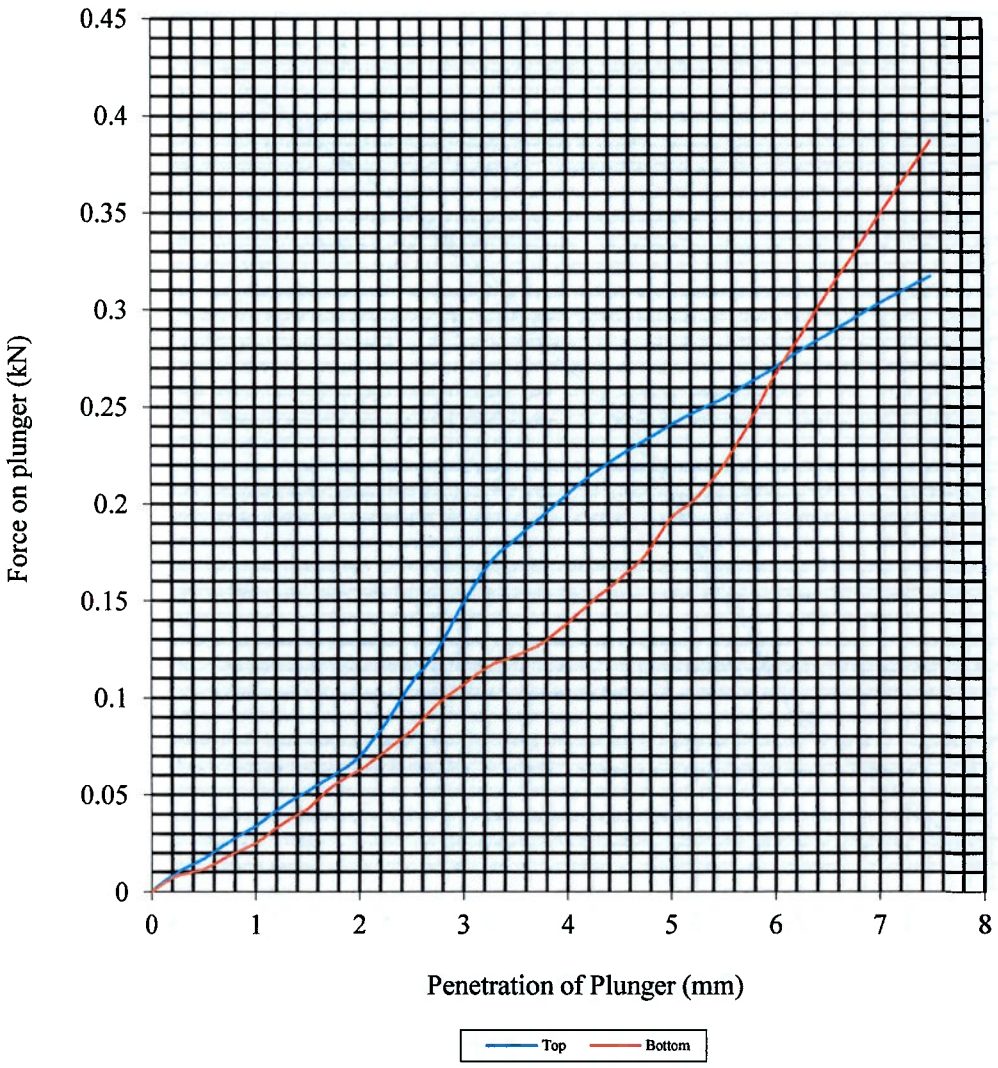
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: TP31 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	18.9	Surcharge Kg:	4.00	Sample Top	18.8	Sample Top	1.2
Bulk Density Mg/m3:	2.04	Soaking Time hrs	0	Sample Bottom	19.1	Sample Bottom	1.0
Dry Density Mg/m3:	1.72	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENIKA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

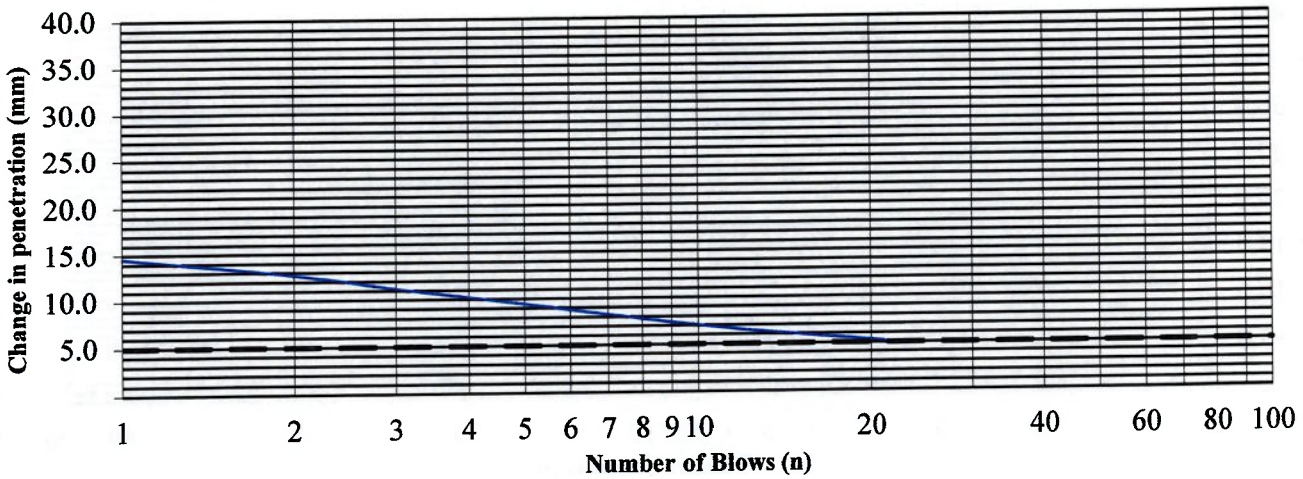
Hole Number: TP01 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	67.3	14.6
2	59.7	12.7
3	55.4	11.2
4	52.7	10.2
6	49.2	8.8
8	47.0	7.8
12	44.2	6.5
16	42.5	5.8
24	40.4	4.9
32	39.2	
48	37.7	
64	36.7	
96	35.5	
128		
192		
256		

Test Results.

Water Content (%)	13.2
MCV	12.6

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

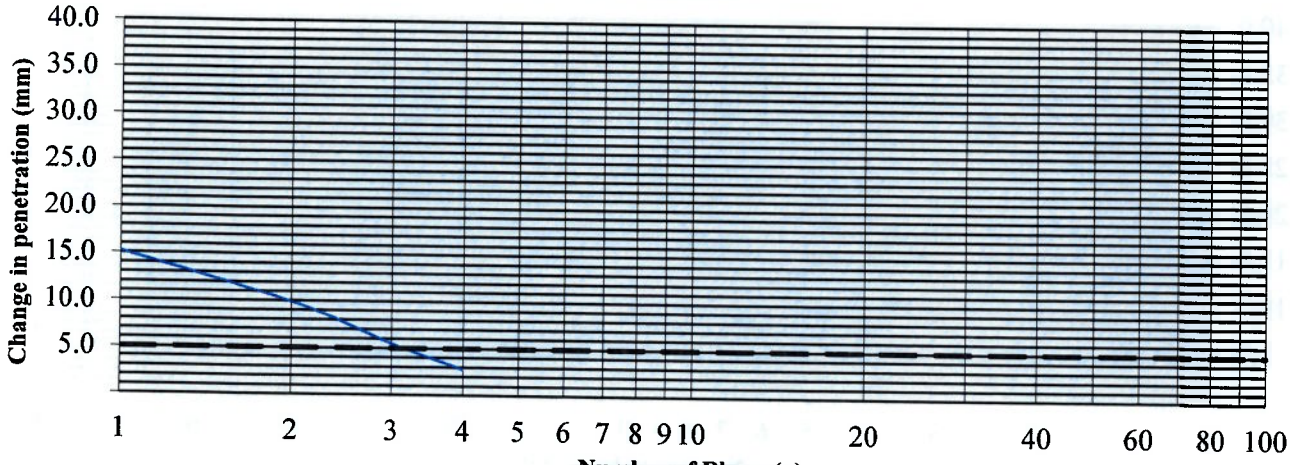
Hole Number: TP01 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	55
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	48.9	15.2
2	40.9	9.9
3	36.5	5.5
4	33.7	2.8
6	31.2	
8	31.0	
12	31.0	
16	30.9	
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	10.2
MCV	5.1

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

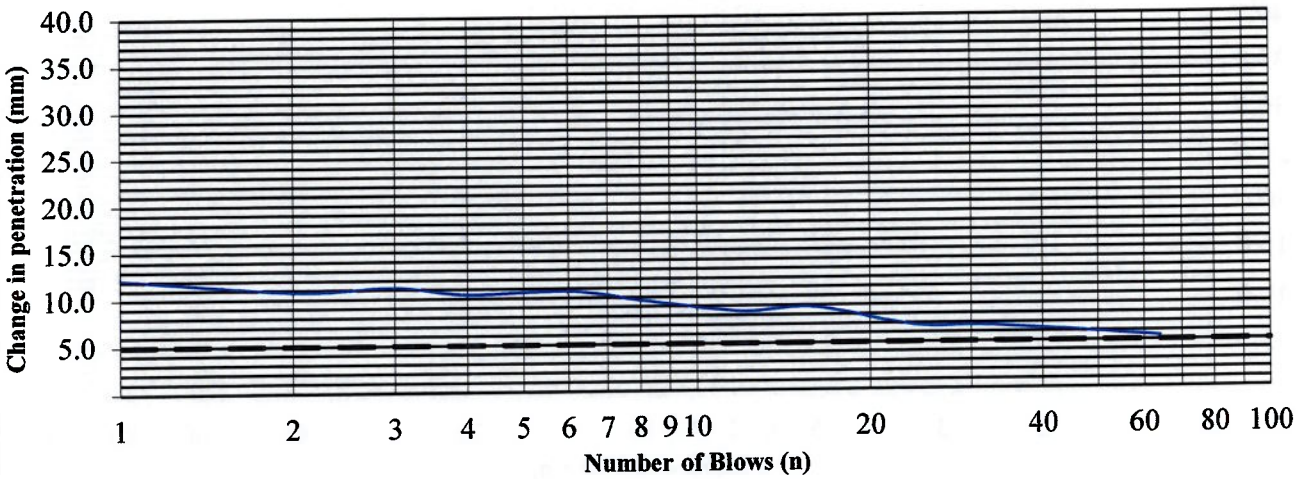
Hole Number: TP02 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	77
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	70.5	12.2
2	62.1	10.8
3	59.5	11.2
4	58.3	10.4
6	54.7	10.7
8	51.3	9.7
12	48.3	8.4
16	47.9	8.8
24	44.0	6.8
32	41.6	6.7
48	39.9	6.0
64	39.1	5.4
96	37.2	
128	34.9	
192	33.9	
256	33.7	

Test Results.

Water Content (%)	5.4
MCV	>20

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

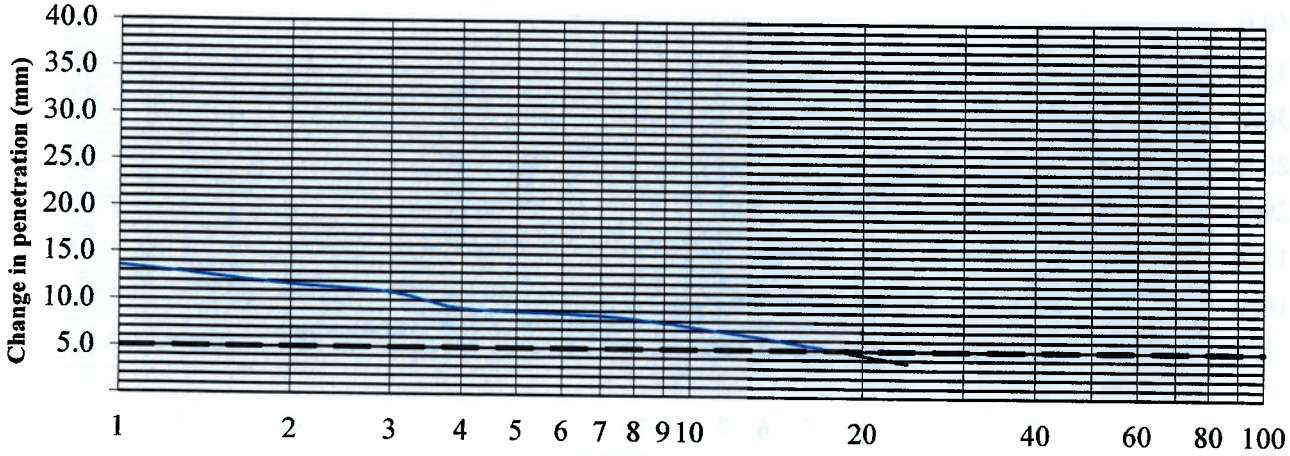
Hole Number: TP03 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	31
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	68.6	13.6
2	62.0	11.7
3	58.2	10.9
4	55.0	9.2
6	52.3	8.7
8	50.3	8.2
12	47.3	6.7
16	45.8	5.5
24	43.6	3.7
32	42.1	
48	40.6	
64	40.3	
96	39.9	
128		
192		
256		

Test Results.

Water Content (%)	13.4
MCV	12.7

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

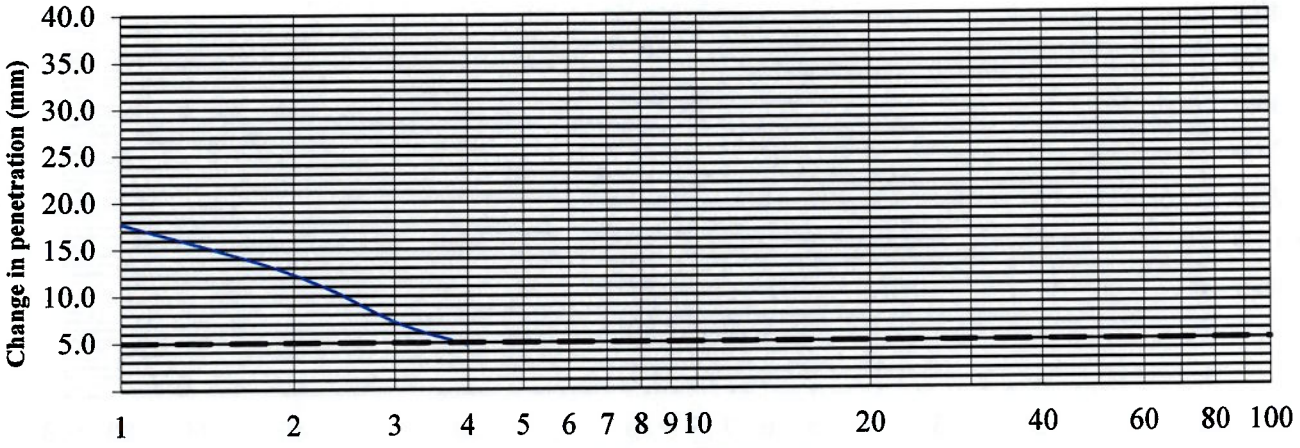
Hole Number: TP04 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	34
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	62.8	17.8
2	53.4	12.3
3	47.9	7.2
4	45.0	4.7
6	42.2	
8	41.1	
12	40.7	
16	40.3	
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	18.8
MCV	5.5

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

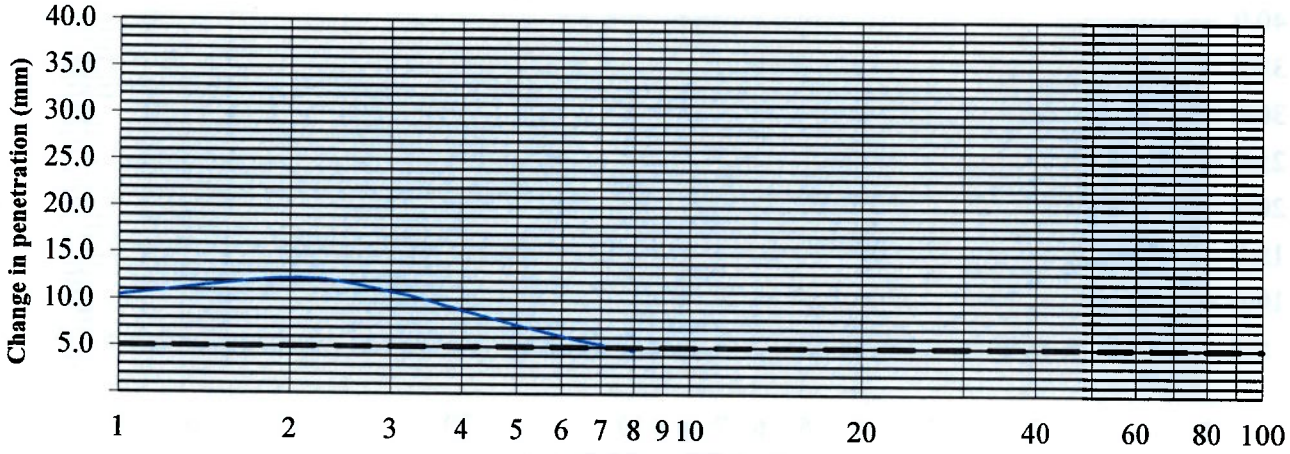
Hole Number: TP05 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	27
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	49.5	10.4
2	45.5	12.3
3	41.9	10.9
4	39.1	8.9
6	35.3	6.1
8	33.2	4.6
12	31.0	
16	30.2	
24	29.2	
32	28.6	
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	8.9
MCV	8.4

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

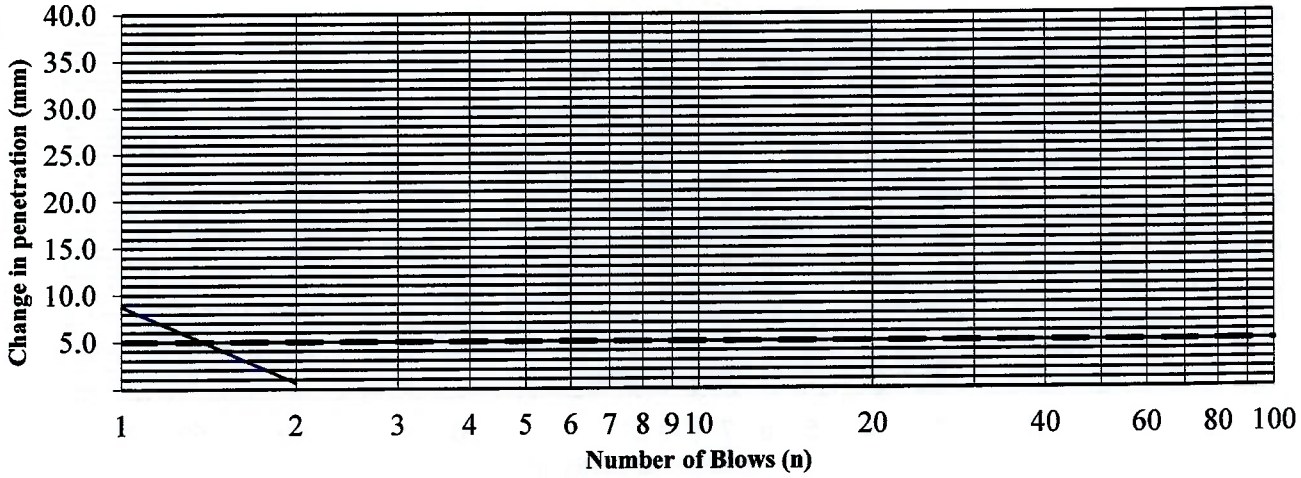
Hole Number: TP06 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	12
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	47.5	8.8
2	39.2	0.6
3	38.9	
4	38.7	
6	38.7	
8	38.6	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	17.4
MCV	1.5

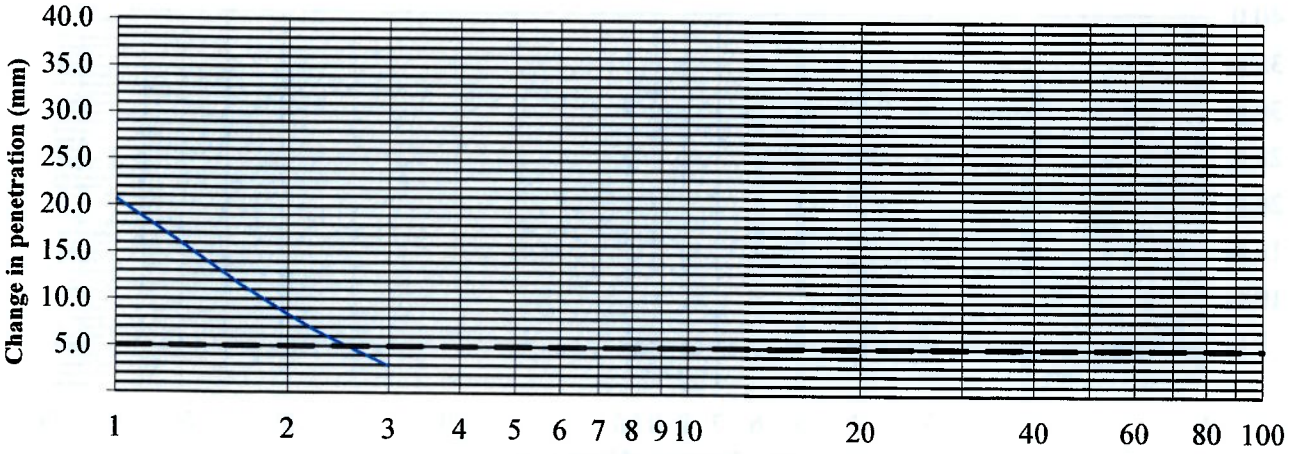
MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

Hole Number:	**TP07**	**Top Depth (m):**	**2.00**
Sample Number:		**Base Depth (m):**	
Sample Type:	**B&D**		

Material Retained on the 20mm BS Test Sieve (%):	28
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	63.0	20.7
2	49.9	8.4
3	44.3	2.9
4	42.3	
6	41.6	
8	41.5	
12	41.4	
16		
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	20.9
MCV	3.8

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

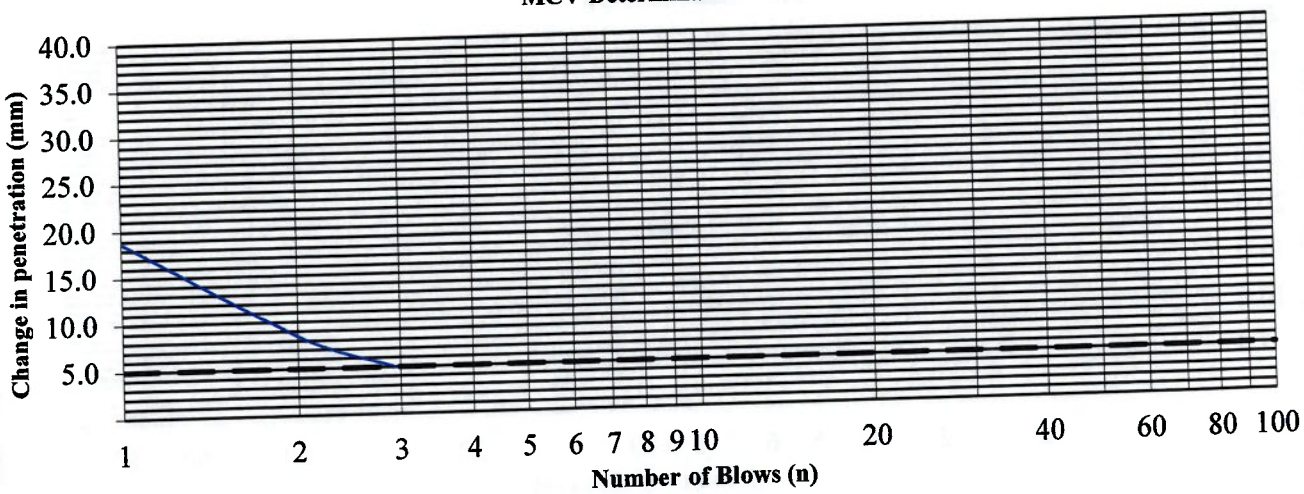
Hole Number: TP08 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	19
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	58.0	18.8
2	44.6	8.5
3	40.7	4.8
4	39.2	
6	37.1	
8	36.1	
12	35.9	
16		
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	17.9
MCV	4.6

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

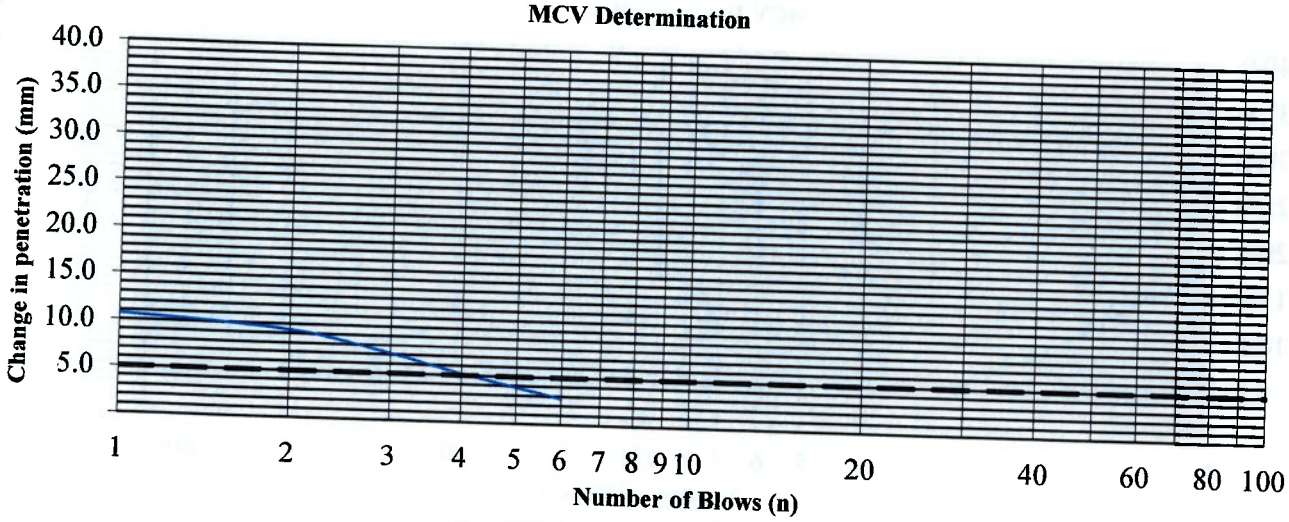
Hole Number: TP10 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	11
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	52.4	10.7
2	47.0	9.4
3	43.8	7.1
4	41.7	5.2
6	39.1	2.8
8	37.6	
12	36.7	
16	36.5	
24	36.3	
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	13.5
MCV	6.2

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

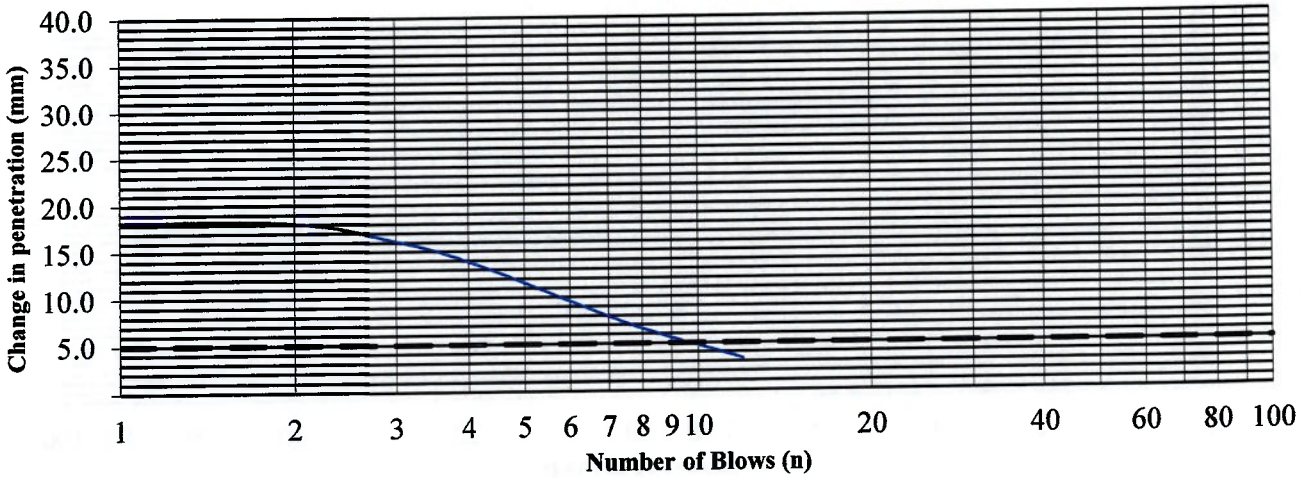
Hole Number: TP12 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	75.9	18.3
2	67.0	18.1
3	61.4	16.1
4	57.6	13.9
6	52.1	9.6
8	48.9	6.6
12	45.3	3.3
16	43.7	
24	42.5	
32	42.3	
48	42.0	
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	20.4
MCV	9.6

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

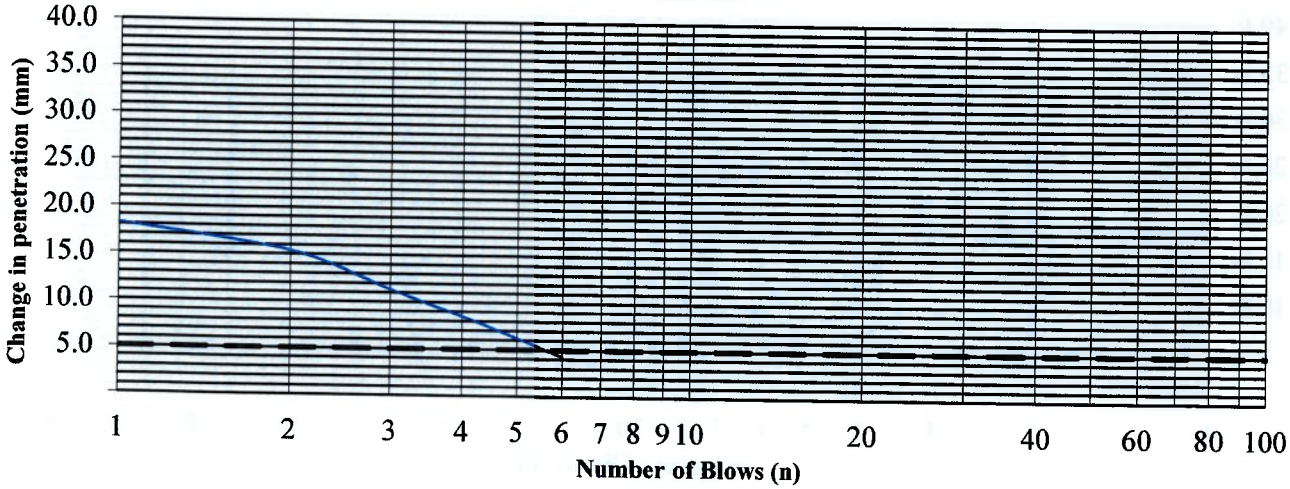
Hole Number: TP13 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	60.7	18.2
2	51.5	15.4
3	46.0	11.3
4	42.5	8.5
6	38.2	4.3
8	36.1	
12	34.7	
16	34.0	
24	33.9	
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	12.7
MCV	7.6

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

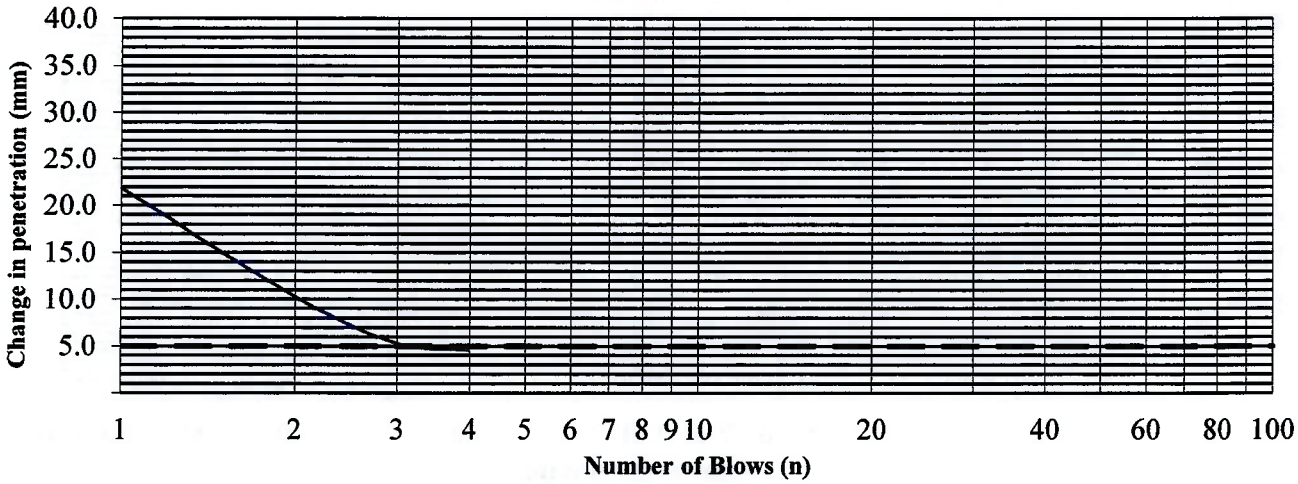
Hole Number: TP16 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	19
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	61.2	21.9
2	46.1	10.3
3	40.3	5.3
4	39.3	4.6
6	37.4	
8	35.8	
12	35.0	
16	34.7	
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	13.5
MCV	4.2

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

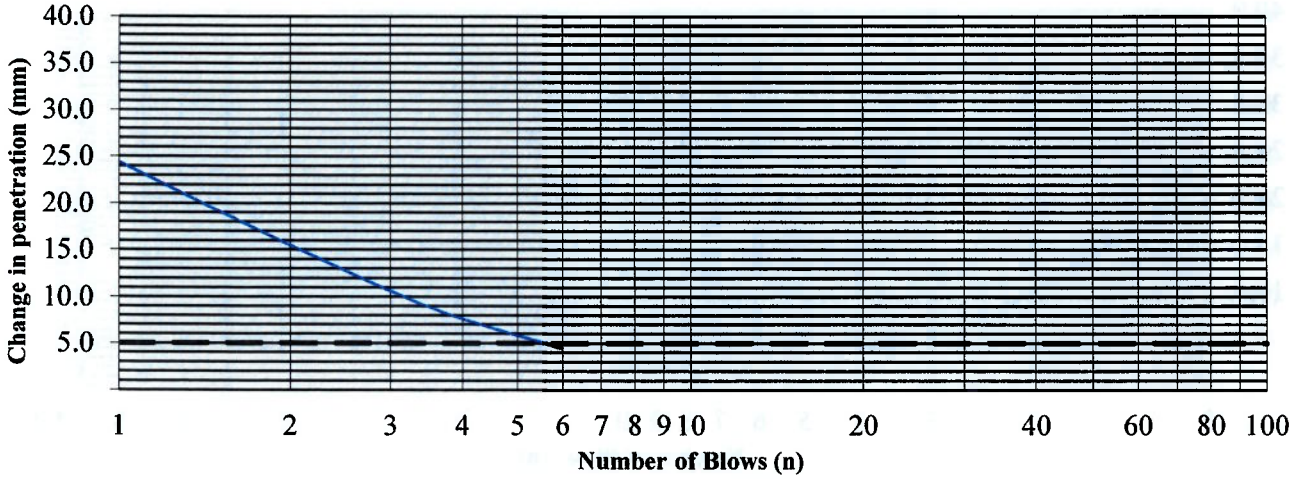
Hole Number: TP19 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	76.7	24.4
2	62.9	15.5
3	55.9	10.6
4	52.3	7.6
6	48.3	4.4
8	47.4	
12	45.3	
16	44.7	
24	43.9	
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	18.9
MCV	6.7

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

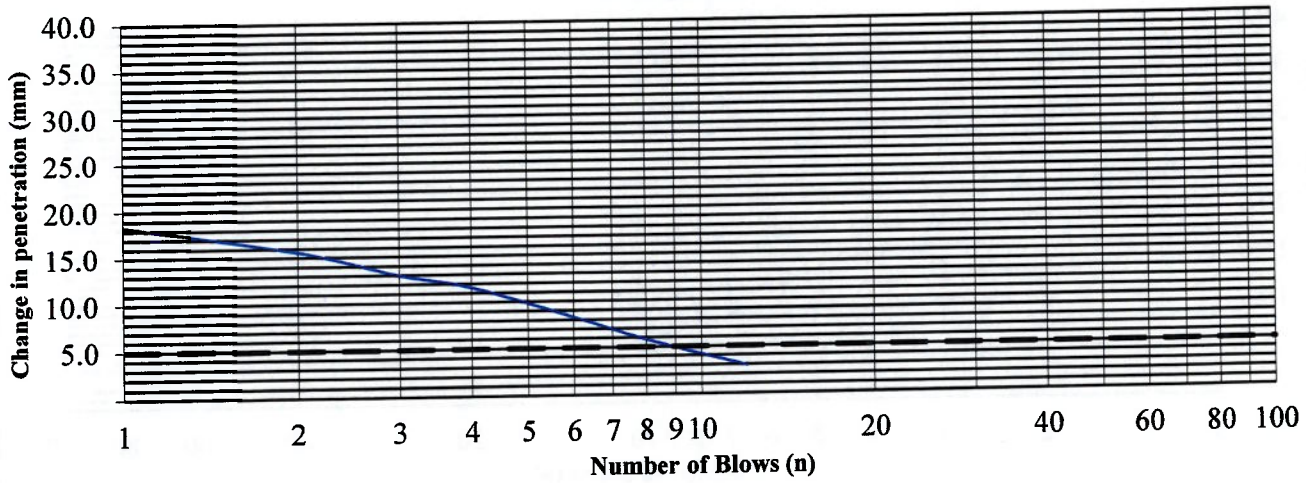
Hole Number: TP22 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	74.9	18.4
2	65.0	15.6
3	59.4	13.0
4	56.5	11.6
6	52.1	8.3
8	49.4	5.8
12	46.4	2.9
16	44.9	
24	43.8	
32	43.6	
48	43.5	
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	22.1
MCV	9.5

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

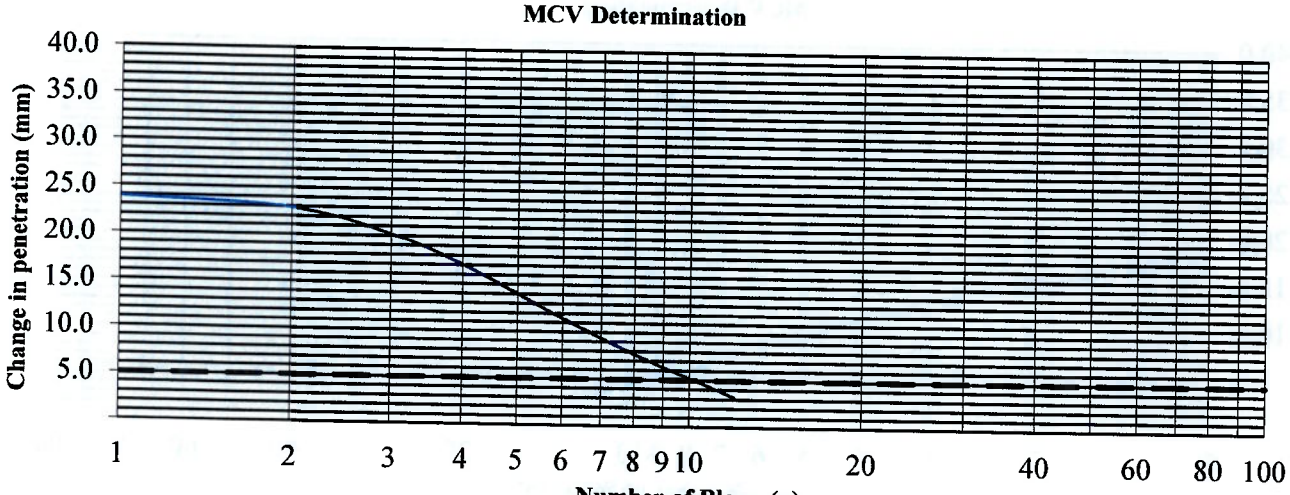
Hole Number: TP24 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	89.2	23.9
2	77.6	22.9
3	70.3	20.2
4	65.3	17.1
6	58.7	11.5
8	54.7	7.7
12	50.1	3.2
16	48.2	
24	47.2	
32	47.0	
48	46.9	
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	27.7
MCV	9.9

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

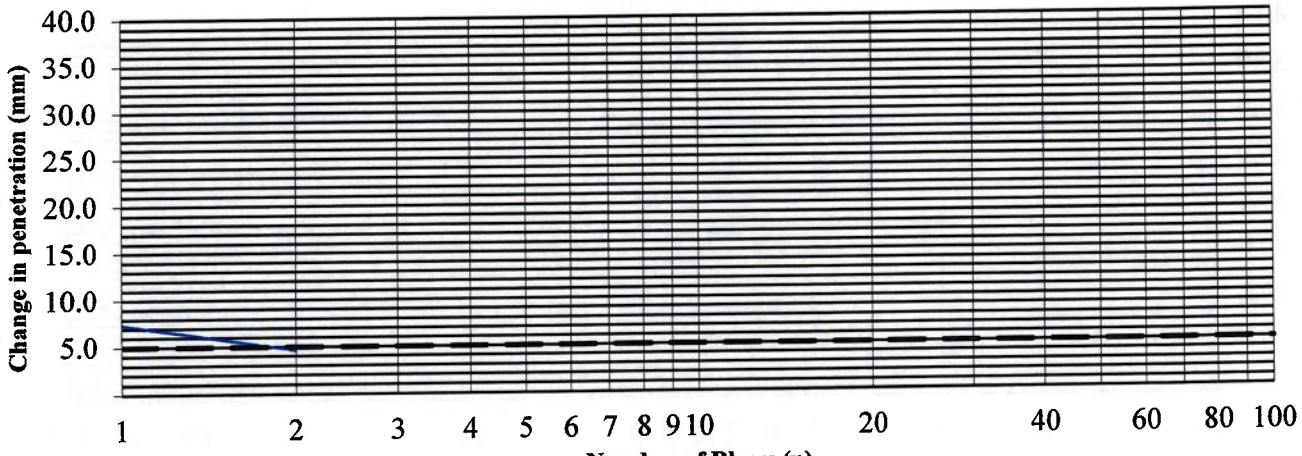
Hole Number: TP26 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	51.7	7.4
2	47.6	4.6
3	45.2	
4	44.3	
6	43.4	
8	43.0	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	19.3
MCV	2.7

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

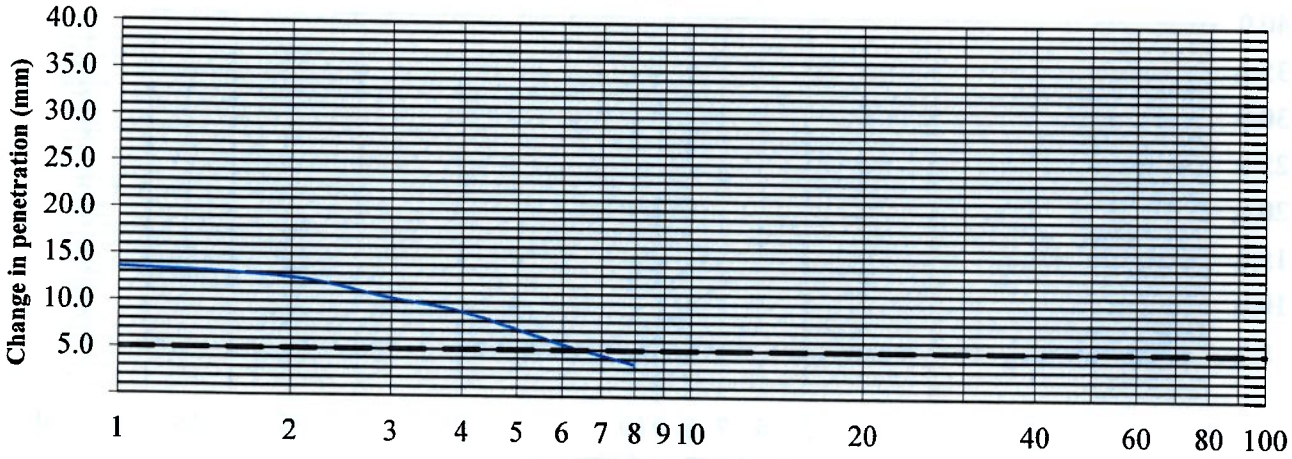
Hole Number: TP29 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	12
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	55.7	13.6
2	48.7	12.6
3	44.4	10.4
4	42.1	9.0
6	38.5	5.6
8	36.1	3.5
12	34.0	
16	33.1	
24	32.9	
32	32.6	
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	11.3
MCV	8.2

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

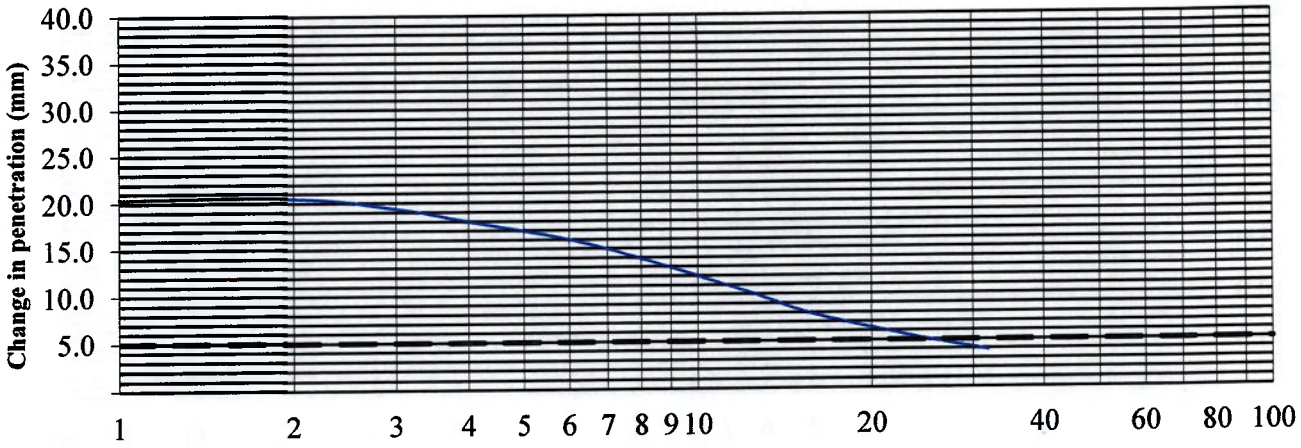
Hole Number: TP33 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	87.8	20.4
2	78.2	20.5
3	71.9	19.4
4	67.4	18.0
6	61.8	16.0
8	57.7	13.9
12	52.5	10.4
16	49.4	7.8
24	45.8	5.3
32	43.8	3.9
48	42.1	
64	41.6	
96	40.5	
128	39.9	
192		
256		

Test Results.

Water Content (%)	21.0
MCV	13.5

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

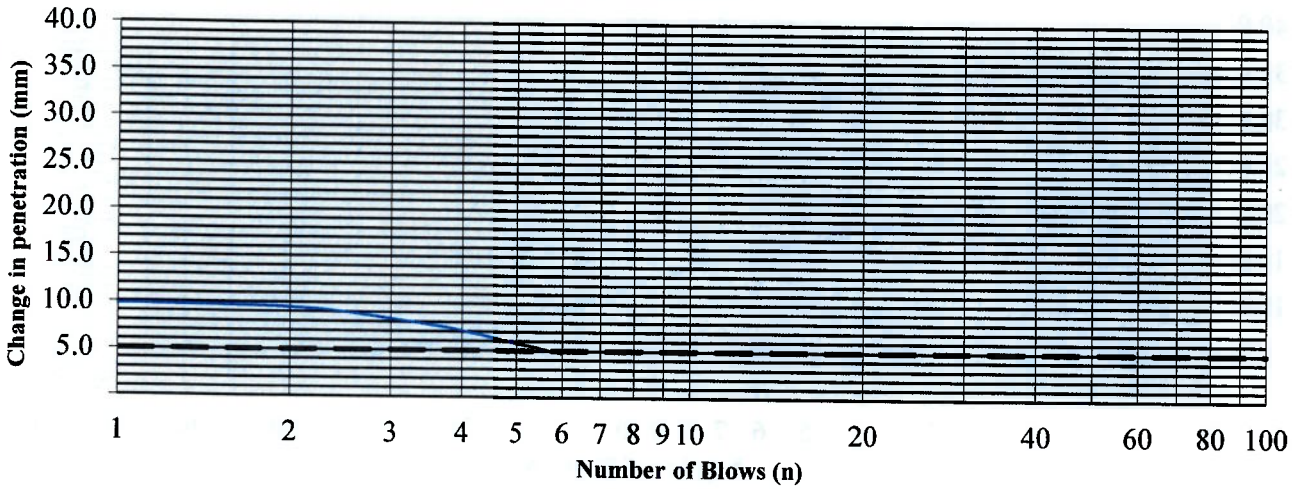
Hole Number: TP34 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	26
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	47.8	9.8
2	42.8	9.5
3	40.1	8.3
4	38.0	7.1
6	35.3	4.7
8	33.3	
12	31.8	
16	30.9	
24	30.6	
32		
48		
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	9.7
MCV	7.8

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A MENNA GROUP COMPANY

Coolpowra Galway

Contract No: PSL24/7255

Client Ref: 13999-07-24

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

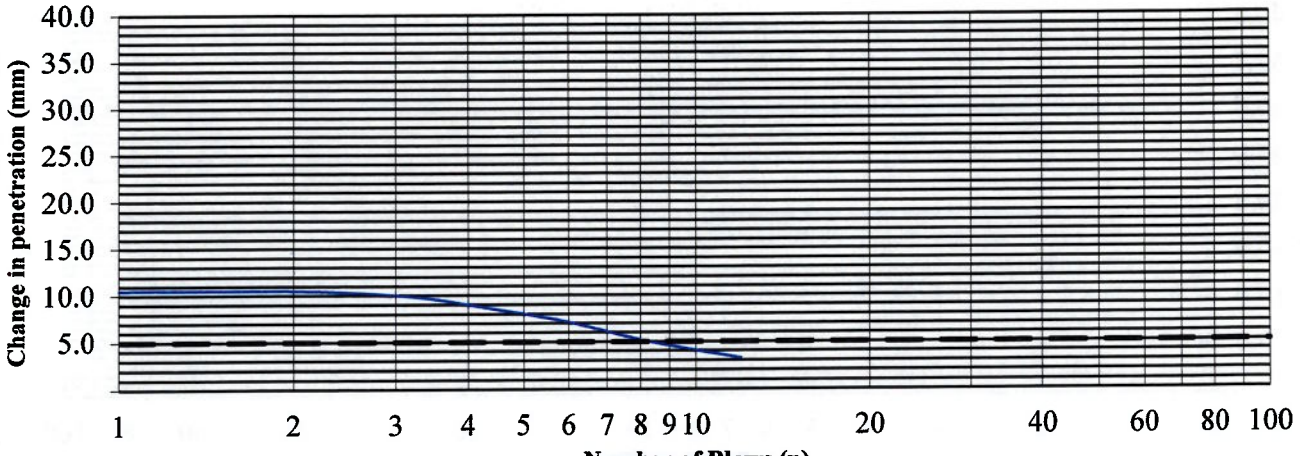
Hole Number: TP35 **Top Depth (m):** 1.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	30
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	50.6	10.5
2	45.4	10.5
3	42.4	10.0
4	40.1	9.0
6	37.1	7.1
8	34.9	5.2
12	32.4	3.2
16	31.1	
24	30.0	
32	29.7	
48	29.2	
64		
96		
128		
192		
256		

Test Results.

Water Content (%)	8.8
MCV	9.2

MOISTURE CONDITION VALUE (MCV)

BS1377 - Part 2 : 2022 : Clause 13

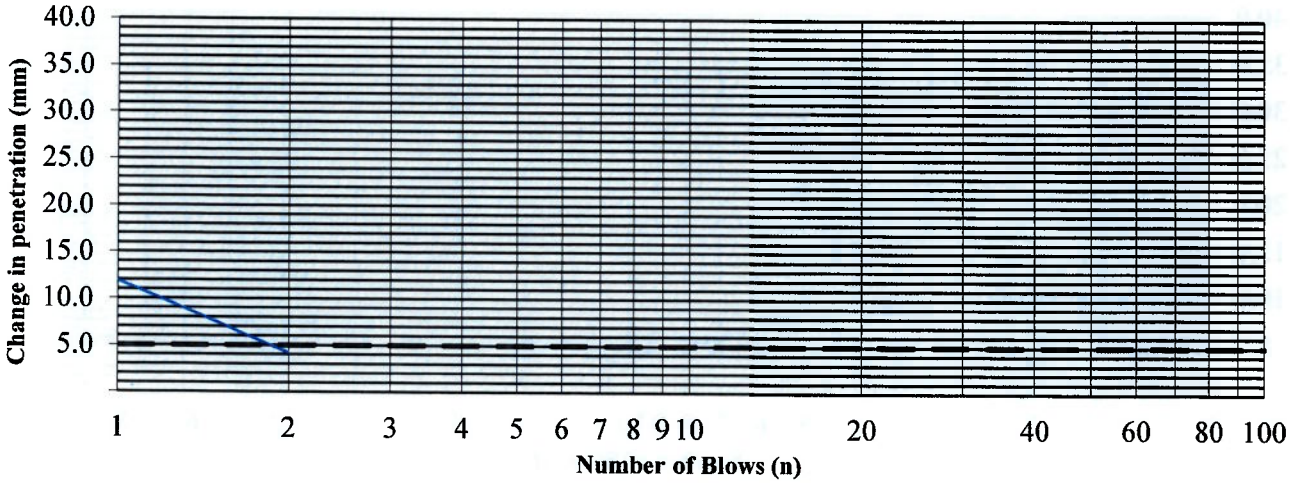
Hole Number: TP38 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B&D

Material Retained on the 20mm BS Test Sieve (%):	0
Interpretation based on steepest straight line intercept with 5mm change in penetration.	

MCV Determination



Blows (N)	Penetration (mm)	n to 4n (mm)
1	56.1	11.9
2	46.9	4.2
3	45.6	
4	44.2	
6	43.0	
8	42.7	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

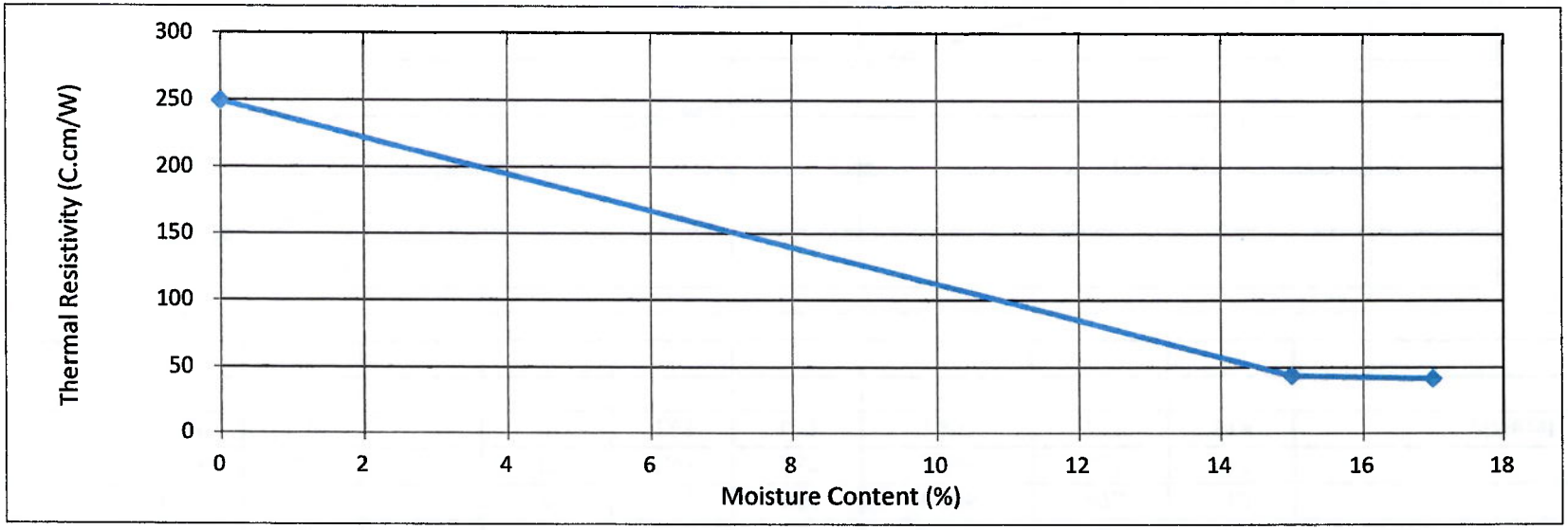
Test Results.

Water Content (%)	13.8
MCV	2.7

SUMMARY OF THERMAL PROPERTY TESTS

In accordance with ASTM-D5334

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Thermal Conductivity W/m K	Thermal Resistivity C.cm/W	Test Temp C^o	Remarks
TP06		B&D	0.50		0	1.64	1.64	0.402	248.8	29.1	
TP06		B&D	0.50		15	2.07	1.80	2.306	43.4	20.3	
TP06		B&D	0.50		17	2.03	1.74	2.428	41.2	21.0	Natural



PROFESSIONAL SOILS LABORATORY
A PHENNA GROUP COMPANY

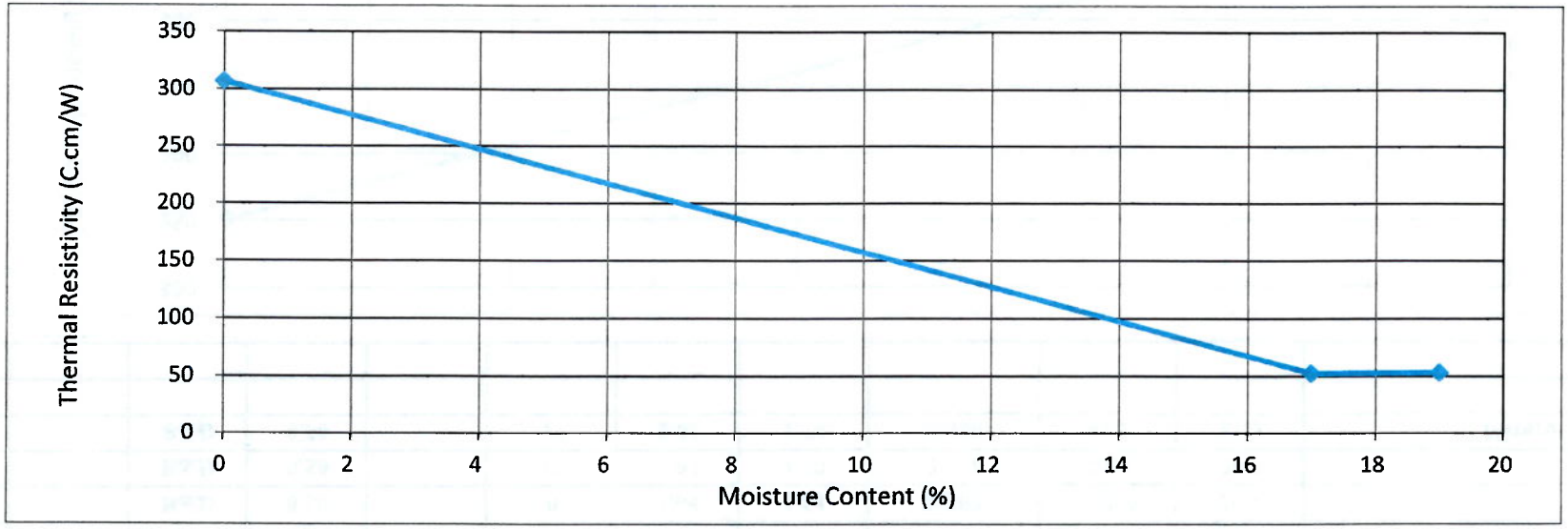
Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

SUMMARY OF THERMAL PROPERTY TESTS

In accordance with ASTM-D5334

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Thermal Conductivity W/m K	Thermal Resistivity C.cm/W	Test Temp C^o	Remarks
TP19		B&D	1.50		0	1.54	1.54	0.326	307.2	34.3	
TP19		B&D	1.50		17	1.95	1.67	1.915	52.2	19.7	
TP19		B&D	1.50		19	2.03	1.71	1.897	52.7	20.6	Natural



PROFESSIONAL SOILS LABORATORY
A PRENNA GROUP COMPANY

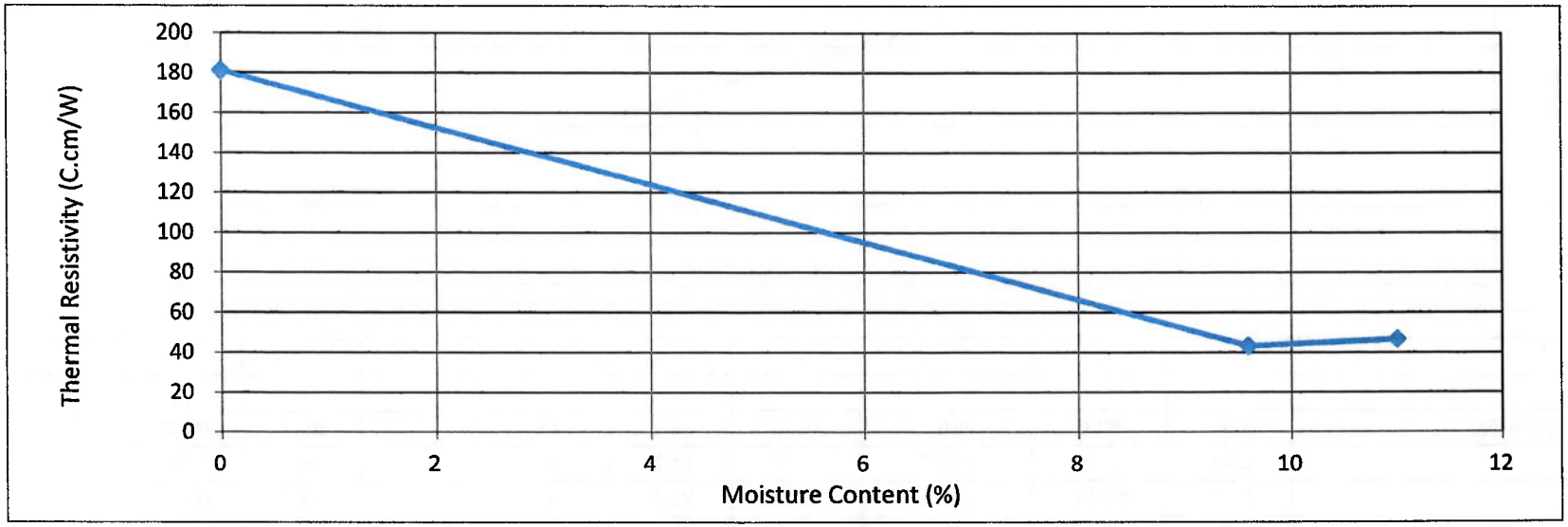
Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

SUMMARY OF THERMAL PROPERTY TESTS

In accordance with ASTM-D5334

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Thermal Conductivity W/m K	Thermal Resistivity C.cm/W	Test Temp C^o	Remarks
TP29		B&D	1.50		0	1.82	1.82	0.553	180.9	31.3	
TP29		B&D	1.50		9.6	2.23	2.03	2.321	43.1	19.1	
TP29		B&D	1.50		11	2.21	1.99	2.151	46.5	20.7	Natural



PROFESSIONAL SOILS LABORATORY
A PHENNA GROUP COMPANY

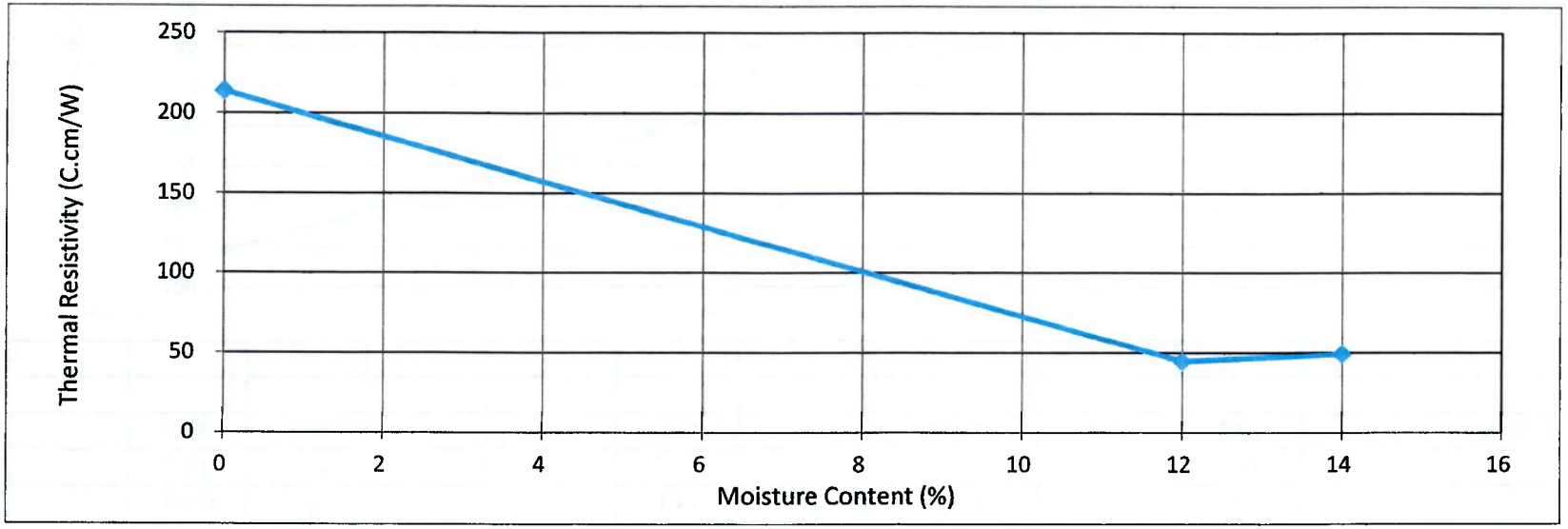
Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

SUMMARY OF THERMAL PROPERTY TESTS

In accordance with ASTM-D5334

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Thermal Conductivity W/m K	Thermal Resistivity C.cm/W	Test Temp C^o	Remarks
TP38		B&D	0.50		0	1.76	1.76	0.468	213.5	26.4	
TP38		B&D	0.50		12	2.19	1.96	2.259	44.3	18.7	
TP38		B&D	0.50		14	2.15	1.89	2.050	48.8	20.4	Natural



PROFESSIONAL SOILS LABORATORY
A PRENNA GROUP COMPANY

Coolpowra Galway

Contract No:
PSL24/7255
Client Ref:
13999-07-24

Old School Building
Ughtyneill
Moynalty
Co.Meath

Geotechnical and Soil Testing Services Ltd

CONTRACT Coolpowra Galway
CLIENT NO. C028
CLIENT Ground Investigations Ireland
ADDRESS Catherinestown House
Hazelhatch Road
Newcastle D22 YD52

REPORT NO: **SA 2407 PLI**
JOB NO: **GII 337**

DATE: 18/10/2024

TEST REPORT FOR DETERMINATION OF POINT LOAD INDEX
Single Diametrical Determination in accordance with ISRM 1985

Sample Number		SA2407 to SA 2427
Sampled By		Client
Sampled Date		08/10/2024
Received Date		08/10/2024
Sample Source/Location	*	Coolpowra Galway
Depth /Location	*	Coolpowra Galway
Sample Description		Rock core
Rock Type tested		Core
Sample Ref / Identification		See table of Results
Date Start Test		26/09/24
Date Tested		26/09/24
Deviations from Standard		None

Test Results

Sample No.	BH No.	Average Diameter	Height/ Length	Distance between contact point and free end	Load at Failure (kN)	IS(50) Mpa	Density (Mg/M3)
2407	BH01 @3.56-3.70m	63.50	160.00	>0.5	20.71	**4.74**	2.53
2409	BH01 @4.20-4.39m	63.50	210.00	>0.5	18.71	**4.28**	2.63
2410	BH02 @5.72-5.90m	63.50	200.00	>0.5	14.73	**3.37**	2.63
2412	BH02 @7.45-7.55m	63.50	110.00	>0.5	9.17	**2.10**	2.61
2414	BH03 @2.97-3.05m	63.50	215.00	>0.5	14.31	**3.28**	2.65
2415	BH03 @3.40-3.55m	63.50	195.00	>0.5	9.47	**2.17**	2.62
2416	BH04 @2.35-2.48m	63.50	165.00	>0.5	11.51	**2.64**	2.62
2417	BH04 @2.75-2.86m	63.50	190.00	>0.5	7.93	**1.82**	2.61
2420	BH05 @3.45-3.57m	63.50	180.00	>0.5	11.40	**2.61**	2.63
2421	BH05 @4.10-4.30m	63.50	225.00	>0.5	14.02	**3.21**	2.63
2423	BH06 @2.90-2.98m	63.50	125.00	>0.5	9.00	**2.06**	2.63
2424	BH06 @3.11-3.20m	63.50	130.00	>0.5	7.89	**1.81**	2.63
2426	BH07 @2.95-3.02m	63.50	145.00	>0.5	5.86	**1.34**	2.65
2427	BH07 @4.15-4.35	63.50	230.00	>0.5	8.04	**1.84**	2.64

Notes: *Specimens prepared and tested in accordance with suggested method from
International Society for Rock Mechanics (ISRM), 1985

This test report shall not be reproduced except in full,without the prior written approval of the laboratory.

Results relate only to the sample tested and apply to sample as receieved.

(*)Denotes sample information above has been provided by the client.

Signed: _____ **Date:** ___ 18/10/2024

for Geotechnical and Soil Testing Services Ltd

Authorised signatories : G. Reilly

End of Report

Old School Building
Ughtyneill
Moynalty
Co.Meath

Geotechnical and Soil Testing Services Ltd

CONTRACT Coolpowra Galway
CLIENT NO. C028
CLIENT Ground Investigations Ireland
ADDRESS Catherinestown House
Hazelhatch Road
Newcastle D22 YD52

REPORT NO: **SA 2408 UCS**
JOB NO: **GII 337**

DATE: 18/10/2024

TEST REPORT FOR DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH
of Rock cores in accordance with ISRM 1985

Sample Number	SA2408	SA 2425
Sampled By	Client	
Sampled Date	08/10/2024	
Received Date	08/10/2024	
Sample Source/Location	* Coolpowra Galway	
Depth /Location	See table of Results	
Sample Description	Rock core	
Rock Type tested	Core	
Sample Ref / Identification	See table of Results	
Date Start Test	26/09/24	
Date Tested	26/09/24	
Deviations from Standard	None	

Test Results

Sample No.	BH No. / Depth	Average Diameter	Height/ Length	Length / Dia Ratio	Load at Failure (kN)	Unconfined Compressive Strength **(Mpa)**	Density (Mg/M3)
2408	BH01 @3.90-4.12m	63.50	152.20	2.40	68.00	**21.50**	2.63
2411	BH02 @6.30-6.50m	63.50	161.00	2.54	132.20	**41.70**	2.57
2413	BH03 @2.52-2.66m	63.50	154.30	2.43	123.80	**39.00**	2.66
2418	BH04 @4.25-4.45m	63.50	167.20	2.63	54.70	**17.20**	2.63
2419	BH05 @2.20-2.47m	63.50	157.00	2.47	104.80	**33.00**	2.66
2422	BH06 @2.60-2.85m	63.50	158.80	2.50	102.30	**32.20**	2.64
2425	BH07 @2.45-2.70m	63.50	157.30	2.48	109.50	**34.60**	2.65

Notes: *Specimens prepared and tested in accordance with suggested method from
International Society for Rock Mechanics (ISRM), 1985

This test report shall not be reproduced except in full,without the prior written approval of the laboratory.

Results relate only to the sample tested and apply to sample as receieved.

(*)Denotes sample information above has been provided by the client.

Signed: _____ **Date:** ___ 18/10/2024

for Geotechnical and Soil Testing Services Ltd

Authorised signatories : G. Reilly

End of Report

APPENDIX 9 – Geophysical Survey



AGP24105_01

REPORT
ON THE
GEOPHYSICAL INVESTIGATION
FOR THE
COOLPOWRA POWER PLANT
CO. GALWAY
FOR
GROUND INVESTIGATIONS IRELAND LIMITED

6TH DECEMBER 2024

apex geophysics

APEX Geophysics Limited
Unit 6, Knockmullen Business Park
Gorey
Co. Wexford

T: 0402 21842
E: info@apexgeophysics.ie
W: www.apexgeophysics.com

PRIVATE AND CONFIDENTIAL

THE FINDINGS OF THIS REPORT ARE THE RESULT OF A GEOPHYSICAL SURVEY USING NON-INVASIVE SURVEY TECHNIQUES CARRIED OUT AT THE GROUND SURFACE. INTERPRETATIONS CONTAINED IN THIS REPORT ARE DERIVED FROM A KNOWLEDGE OF THE GROUND CONDITIONS, THE GEOPHYSICAL RESPONSES OF GROUND MATERIALS AND THE EXPERIENCE OF THE AUTHOR. APEX GEOPHYSICS LTD. HAS PREPARED THIS REPORT IN LINE WITH BEST CURRENT PRACTICE AND WITH ALL REASONABLE SKILL, CARE AND DILIGENCE IN CONSIDERATION OF THE LIMITS IMPOSED BY THE SURVEY TECHNIQUES USED AND THE RESOURCES DEVOTED TO IT BY AGREEMENT WITH THE CLIENT. THE INTERPRETATIVE BASIS OF THE CONCLUSIONS CONTAINED IN THIS REPORT SHOULD BE TAKEN INTO ACCOUNT IN ANY FUTURE USE OF THIS REPORT.

PROJECT NUMBER	AGP24105		
AUTHOR	**CHECKED**	**REPORT STATUS**	**DATE**
TONY LOMBARD M.SC. (GEOPHYSICS) & SEBASTIAN CORRALES B.SC. (GEOPHYSICS)	DR. YVONNE O'CONNELL P.GEO, EURGEOL, PH.D., M.SC. (GEOPHYSICS)	01	6TH DECEMBER 2024

CONTENTS

1. EXECUTIVE SUMMARY 14
2. INTRODUCTION 15
2.1 Survey Objectives 15
2.2 Site Background 15
2.2.1 Soils 15
2.2.2 Geology 16
2.2.3 Groundwater 17
2.2.4 Historical Mapping Data 17
2.2.5 Direct Investigation 18
2.3 Survey Rationale 18
3. RESULTS 19
3.1 EM Ground Conductivity Mapping 19
3.2 ERT 19
3.3 Seismic Refraction Profiling 19
3.4 Integrated Interpretation 19
4. RECOMMENDATIONS 21
REFERENCES 22
APPENDIX A: DETAILED METHODOLOGY 23
EM Ground Conductivity Mapping 23
Electrical Resistivity Tomography 23
Seismic refraction profiling 24
Spatial Relocation & Survey Locations 25
APPENDIX B: EXCAVATABILITY 26
APPENDIX C: SEISMIC REFRACTION PLATES 27
APPENDIX D: DRAWINGS 32

1. EXECUTIVE SUMMARY

APEX Geophysics Limited was commissioned by Ground Investigations Ireland Limited to carry out a geophysical investigation for the proposed Coolpowra Power Plant, County Galway. The purpose of the geophysical investigation was to provide information on the sub-soil conditions across the site including type, thickness and stiffness of the soils, depth to bedrock, type, quality and excavatability of bedrock, the presence of faults, fissures and possible karst features within the bedrock.

The site is located south of Oldstreet Substation, situated approximately 5.1 km north of the town of Portumna in County Galway. The area surveyed is c. 20.4 ha in extents and comprises of open agricultural land. The topography rises from 47.1 mOD in the northwest to 54.8 mOD in the north.

The Geological Survey of Ireland (GSI) Quaternary sediments map for the area indicates the site is in an area of till derived from limestones. The GSI bedrock map indicates the site is underlain by dark grey to black bedded limestone and shale of the Lucan Formation. Though karst features are atypical in the Lucan Formation, the GSI Karst Database indicates the nearest karst feature is a spring >13 km north of the site.

Trial pits and soakaway pits generally encountered topsoil and made ground over soft to very stiff sandy gravelly clay, silty clay, clayey gravelly sand and clayey sandy gravel. The coreholes generally encountered thin topsoil, stiff-very stiff sandy gravelly clay and dense clayey sandy gravel and possible weathered rock over slightly weathered to fresh argillaceous LIMESTONE at depths of 2.0 to 5.3 m bgl.

The survey was carried out over a number of sessions between the 12th of August and the 23rd of October 2024 and involved the collection of EM ground conductivity data, seven Electrical Resistivity Tomography (ERT) profiles at locations specified by the client and 12 seismic refraction profiles.

The combined geophysical and direct investigation data have been interpreted as indicating the following subsurface layers:

- **Layer 1** - a thin upper layer of predominantly soft sandy gravelly clay with loose clayey sand/gravel soils 0.3 to 1.8 m thick (average 1.0 m).
- **Layer 2** - a layer of predominantly firm to stiff sandy gravelly clay and medium dense to dense clayey sand/gravel to depths ranging from 0.8 to 9.0 m bgl (average 3.5 m). No distinct weathered rock layer could be interpreted from the geophysical data however two trial pits encountered weathered rock and one corehole encountered 1.0 m of possible weathered bedrock. As such, the base of Layer 2 may comprise of highly to moderately weathered rock which would be diggable to marginally rippable.
- **Layer 3** - slightly weathered to fresh rock at elevations ranging from 41.8 to 52.8 mOD. The seismic velocities indicate that the rock is of good quality and any excavation will require heavy breaking/blasting if within proposed construction depth.

Two bedrock types have been interpreted; predominantly high resistivity (300-1,000 Ohm-m) dark limestone with thin interbedded shales with some areas of low resistivity (100-300 Ohm-m) mudstone/shale. A number of possible NE-SW faults are also interpreted across the site.

If bedrock excavation is proposed, a detailed assessment of excavatability should be carried out combining the results of the geophysical survey, rotary core drilling, strength testing and trial excavation pits using a high-powered excavator such as a CAT 336E or more powerful model. Trial excavations should be attempted down to formation level using a high-powered excavator of similar rating to that to be used during construction.

The findings of the geophysical investigation should be reviewed following any further direct investigation.

2. INTRODUCTION

APEX Geophysics Limited was commissioned by Ground Investigations Ireland Limited to carry out a geophysical investigation for the proposed Coolpowra Power Plant, County Galway. The purpose of the geophysical investigation was to provide information on the sub-soil conditions across the site.

2.1 Survey Objectives

The objectives of the investigation were to provide information on:

- Type, thickness and stiffness of the soils.
- Depth to bedrock.
- Type, quality and excavatability of bedrock.
- The presence of faults, fissures and possible karst features within the bedrock.

2.2 Site Background

The site is located south of Oldstreet Substation, situated approximately 5.1 km north of the town of Portumna in County Galway (Fig. 2.1). The area surveyed is c. 20.4 ha in extent and comprises of open agricultural land. The topography rises from 47.1 mOD in the northwest to 54.8 mOD in the north.



Fig 2.1: Location map.

2.2.1 Soils

The Geological Survey of Ireland (GSI) Quaternary sediments map for the area (GSIa, 2019) indicates the site is in an area of till derived from limestones (Fig. 2.2). An area of eskers comprised of gravels is shown to the east of the site and an area of bedrock outcrop or subcrop is shown to the southwest.

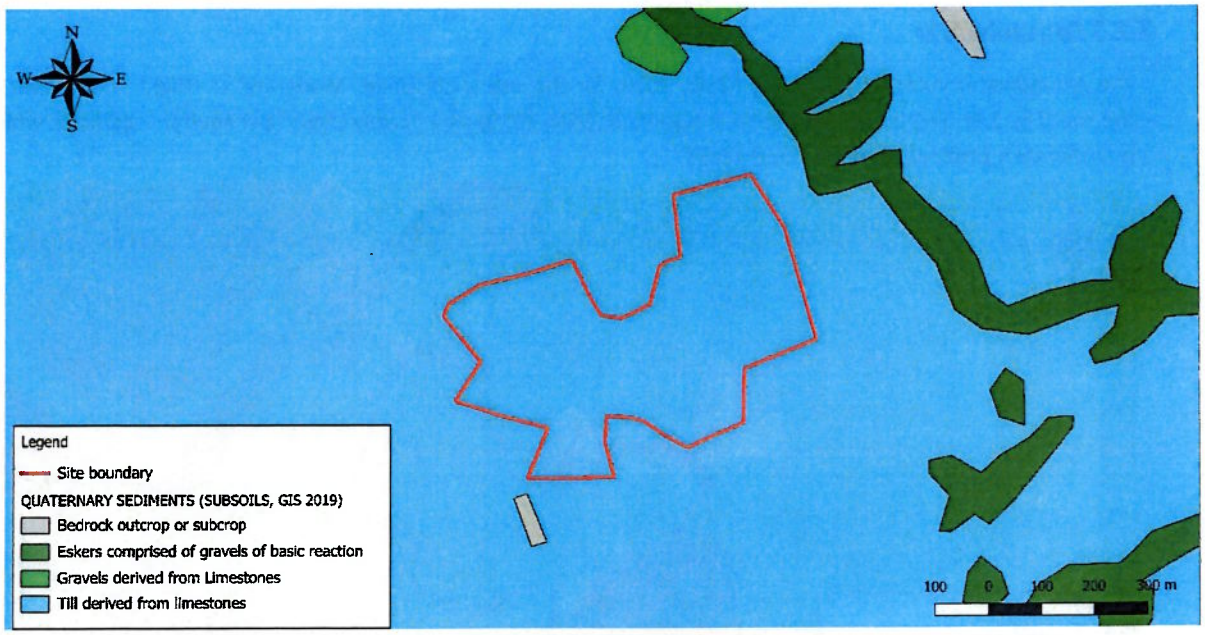


Fig 2.2: The GSI Quaternary sediments map.

2.2.2 Geology

The GSI 1:100k Bedrock Geology map (GSI, 2018) indicates that the site is underlain by dark grey to black bedded limestone and shale of the Lucan Formation ('Calp') (Fig. 2.3). Though karst features are atypical in the Lucan Formation, the GSI Karst Database indicates the nearest karst feature within this formation is a spring >13 km north of the site.

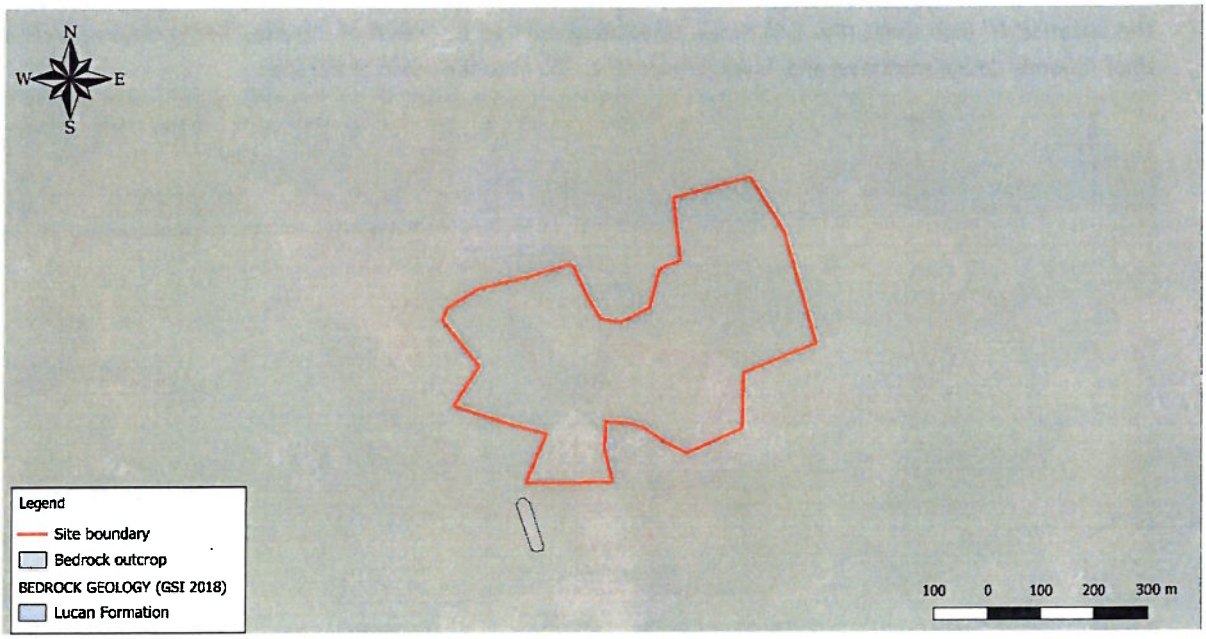


Fig 2.3: The GSI bedrock map.

2.2.3 Groundwater

The groundwater vulnerability rating (GSIb, 2019) for the site is classified 'Moderate' to 'High' in the west of the site (Fig. 2.4). The Lucan Formation is classified (GSIc, 2019) as a 'locally important aquifer – bedrock which is moderately productive only in local zones.'

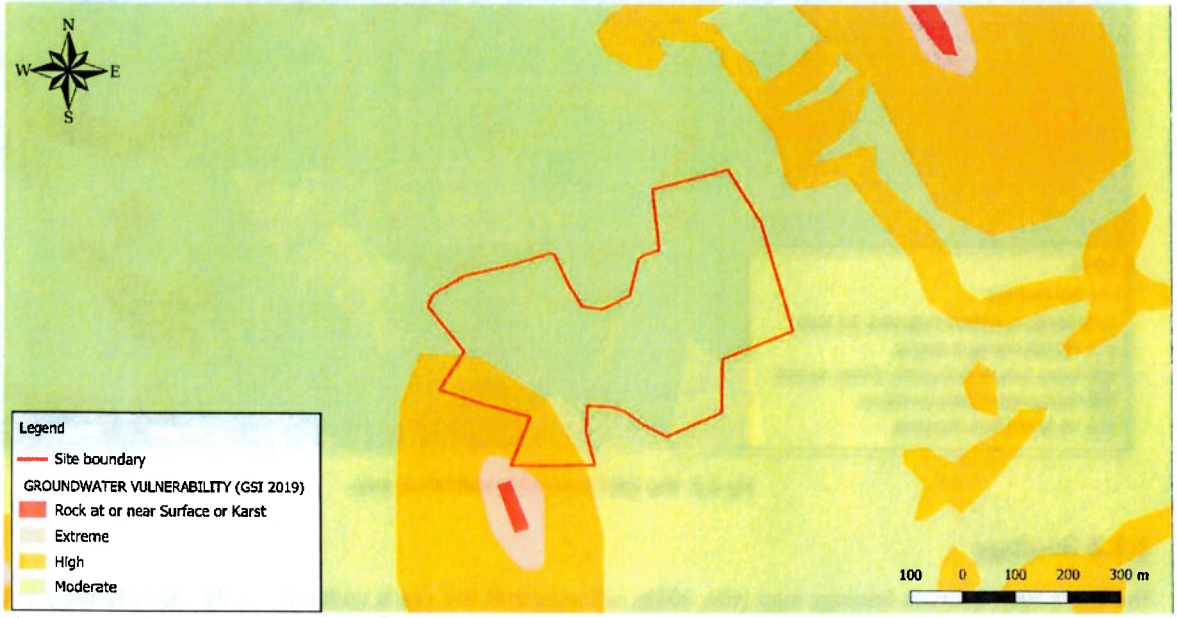


Fig 2.4: The GSI groundwater vulnerability classification map.

2.2.4 Historical Mapping Data

The historical 6'' inch sheet (Fig. 2.5) notes 'Undulating drift' to the north of the site, 'Rocky clayey gravel in small mounds' to the southeast and 'black limestone' c. 100 m to the south of the site.

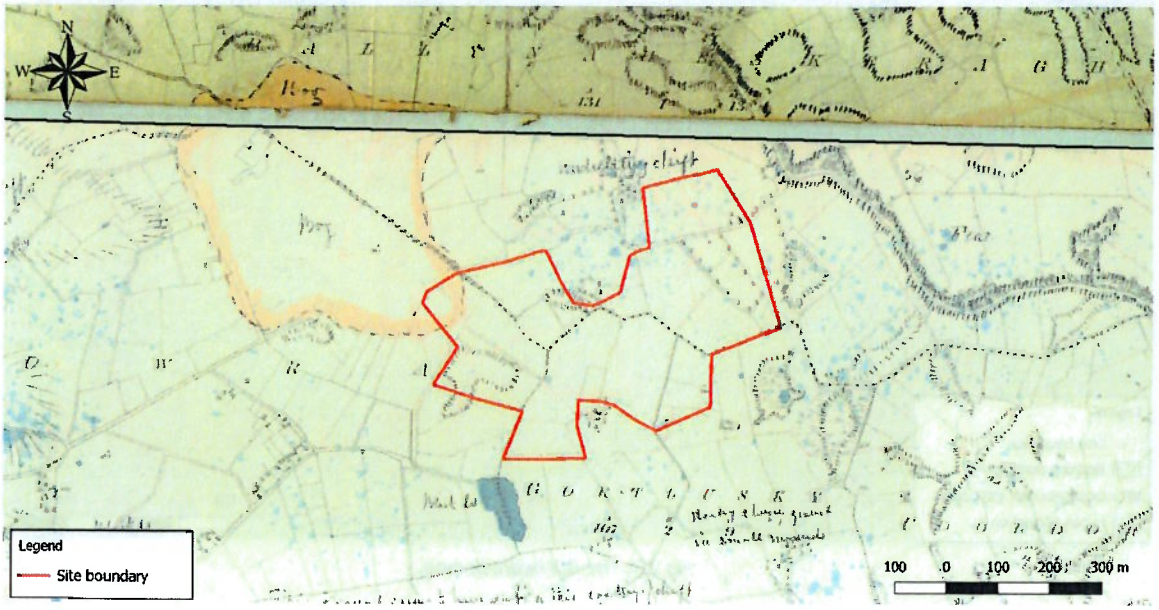


Fig 2.5: The GSI 6-inch geological mapping.

2.2.5 Direct Investigation

Thirty eight trial pits, ten soakaway pits and seven rotary coreholes were completed between 10th September and 2nd October 2024.

The trial pits and soakaway pits generally encountered 0.2 to 0.4 m of topsoil with 0.3 to 2.8 m of made ground of sandy gravelly clay and sandy gravel encountered in six trial pits (TP 07, TP08, TP14, TP17, TP 21 and TP29) over soft to very stiff sandy gravelly clay, silty clay, clayey gravelly sand and clayey sandy gravel. Very soft peat was encountered in one trial pit (TP18) to 0.8 m bgl and weathered rock was encountered in two pits (SK04 and TP17) at depths of 0.6 to 2.2 m bgl. With the exception of nine trial pits (TP05, TP07, TP08, TP10, TP11, TP20, TP26, TP32 and TP33) all trial pits and soakaway pits terminated on obstructions due to possible bedrock or boulders at depths of 1.5 to 3.0 m bgl.

The coreholes generally encountered thin topsoil (in BH05 to BH07), stiff-very stiff sandy gravelly clay and dense clayey sandy gravel and possible weathered rock (Driller's note) over rock. Slightly weathered to fresh argillaceous LIMESTONE was encountered at depths of 2.0 to 5.3 m bgl to termination depths of 6.5 m 10.7 m bgl.

2.3 Survey Rationale

The investigation consisted of EM ground conductivity, 2D Electrical Resistivity Tomography (ERT) and Seismic Refraction profiling:

EM ground conductivity mapping operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). This technique provides information on the shallow (0-6m below ground level) variation of the superficial deposits.

ERT images the resistivity of the materials in the subsurface along a profile to produce a 2-dimensional cross-section showing the variation in resistivity with depth, depending on the length of the profile. Each cross-section is interpreted to determine the material type along the profile at increasing depth, based on the typical resistivities returned for Irish ground materials.

P-wave Seismic Refraction profiling measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities.

As with all geophysical methods the results are based on indirect readings of the subsurface properties. The effectiveness of the proposed approach will be affected by variations in the ground properties. By combining a number of techniques, it is possible to provide a higher quality interpretation and reduce any ambiguities which may otherwise exist. Further information on the detailed methodology of each geophysical method employed in this investigation is given in **APPENDIX A: DETAILED METHODOLOGY**.

3. RESULTS

The survey was carried out over a number of sessions between the 12th of August and the 23rd of October 2024 and involved the collection of EM ground conductivity data, seven ERT profiles (R1-R7) at locations specified by the client and 12 seismic refraction profiles (S1 – S12). The survey locations are shown on Drawing AGP24105_01 (Appendix D).

3.1 EM Ground Conductivity Mapping

The contoured EM ground conductivity results (Drawing AGP24105_02) are indicative of the bulk conductivity of the ground materials from 0 - 6.0 m bgl. Recorded values are in the range of 4.0 to 16.0 mS/m and these have been generally interpreted in conjunction with the ERT and seismic refraction data as follows:

Conductivity (mS/m)	Interpretation
4.0-8.0	Clayey SAND/GRAVEL and Sandy gravelly CLAY over rock
8.0-16.0	Predominantly Sandy gravelly CLAY over rock

3.2 ERT

The ERT results are presented on Drawings AGP24105_R1 to AGP24105_R7. The modelled resistivity values have been interpreted in conjunction with the trial pit and corehole information as follows:

Resistivity (Ohm-m)	Interpretation
64-250	Sandy gravelly CLAY
250-500	Clayey SAND/GRAVEL or weathered rock
100-300	MUDSTONE/SHALE
300-1,500	Dark LIMESTONE with thin interbedded SHALES

3.3 Seismic Refraction Profiling

The seismic data were analysed as tomographic inversions and layered models. The resultant data are plotted on Drawings AGP24105_R1 to AGP24105_R7 and indicate 3 velocity layers which have been interpreted in conjunction with the trial pit and corehole information as follows:

Layer	Seismic Velocity (m/s)	Average Seismic Vel. (m/s)	Interpretation*	Estimated Stiffness/ Rock Quality	Estimated Excavatability
1	240-428	328	Soil	Soft/Loose	Diggable
2	609-1569	1047	Soil	Firm-Stiff / Medium Dense-Dense	
			Highly to Moderately Weathered Rock	Poor-Fair	Diggable – Marginally Ripp.
3	3876-5116	4490	Sightly Weathered to Fresh Rock	Good	Heavy Break/Blast

3.4 Integrated Interpretation

The combined geophysical and direct investigation data are plotted on Drawings AGP24105_R1 to AGP24105_R7 and have been interpreted as indicating the following subsurface layers:

- **Layer 1** - a thin upper layer of predominantly soft sandy gravelly clay or loose clayey sand/gravel soils ranging from 0.3 to 1.8 m thick (average 1.0 m).

- **Layer 2** - a layer of predominantly firm to stiff sandy gravelly clay and/or medium dense to dense clayey sand/gravel to depths ranging from 0.8 to 9.0 m bgl (average 3.5 m). No distinct weathered rock layer could be interpreted from the geophysical data however two trial pits (TP17 and SK04) encountered 0.9 to 1.2 m of weathered rock returned as clayey sandy gravel and one corehole (BH06) encountered 1.0 m of possible weathered bedrock. As such, the base of Layer 2 may comprise of highly to moderately weathered rock which the seismic velocities indicate would be diggable to marginally rippable.
- **Layer 3** - slightly weathered to fresh rock at elevations ranging from 41.8 to 52.8 mOD. The seismic velocities indicate that the rock is of good quality and any excavation will require heavy breaking/blasting if within the proposed construction depth.

The interpreted soil thickness (Layers 1 and 2 combined) is contoured on Drawing AGP23147_03 and ranges from 0.8 m in the south of the site to 9.0 m in the northwest, where there is a localised thickening of sandy gravelly clay soil (Drawing AGP24105_R7). The top of the slightly weathered to fresh rock has been interpreted at elevations ranging from 41.8 mOD in the northwest to 52.8 mOD in the northeast and is contoured on Drawing AGP24105_04.

While there is generally a good correlation between the geophysical data and depth to bedrock encountered in the coreholes, the geophysical data indicates the diggable weathered rock encountered in the trial pits (TP17 and SK04) generally lies within Layer 2 material.

Two bedrock types have been interpreted; predominantly high resistivity (300-1,000 Ohm-m) dark limestone with thin interbedded shales with some areas of low resistivity (100-300 Ohm-m) rock interpreted as mudstone/shale on profiles R2, R3, R4, R6 and R7.

A number of zones of lower bedrock resistivities are present on NW-SE trending ERT profiles (see Drawings AGP24105_R2, R3, R4, R6 and R7). These zones could be indicative of a change in rock lithology (i.e. an increase in shale content) or increased weathering/fracturing/ faulting.

These zones have been interpreted as indicating possible NE-SW faulting as the seismic data across these zones does not indicate the presence of lower velocity zones indicative of weathered/fractured rock. The interpreted fault locations, the lateral extent of which is unclear, are indicated on Drawings AGP24105_03 and AGP24150_04.

NOTE: The maps shown on Drawings AGP24105_02 to AGP24105_04 include a degree of interpolation and extrapolation between the measured geophysical data points and direct investigation data, and reference to the type, number and location of these points should be made when assessing the significance of these data.

4. RECOMMENDATIONS

If bedrock excavation is proposed, a detailed assessment of excavatability should be carried out combining the results of the geophysical survey, rotary core drilling, strength testing and trial excavation pits using a high-powered excavator such as a CAT 336E or more powerful model. Trial excavations should be attempted down to formation level using a high-powered excavator of similar rating to that to be used during construction. A more detailed discussion of velocity and excavatability is contained in Appendix B.

The findings of the geophysical investigation should be reviewed following any further direct investigation.

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APPENDIX A: DETAILED METHODOLOGY

A combination of geophysical techniques was used to provide a high-quality interpretation and reduce any ambiguities, which may otherwise exist.

EM Ground Conductivity Mapping

Principles

This is an electromagnetic technique used to investigate lateral variations in overburden material and to assist with the indication of the depth to bedrock. This method operates on the principle of inducing currents in conductive substrata and measuring the resultant secondary electro-magnetic field. The strength of this secondary EM field is calibrated to give apparent ground conductivity in milliSiemens/metre (mS/m). Readings over material such as organic waste and peat give high conductivity values while readings over dry materials with low clay mineral content such as gravels, limestone or quartzite give low readings. The EM31 survey technique determines the apparent conductivity of the different overburden layers from 0-6m bgl depending on the dipole mode used.

Data collection

The EM31 equipment used was a GF CMD-4 conductivity meter equipped with data logger. This instrument features a real time graphic display of the previous 20 measurement points to monitor data quality and results. Conductivity and in-phase values were recorded across the site. Local conditions and variations were recorded.

Data processing

The conductivity and in-phase field readings were downloaded, contoured and plotted using the SURFER 12 program (Golden Software, 2015). Data which was affected by metallic objects was removed. Assignation of material types and possible anomaly sources was carried out, with cross-reference to other data.

Electrical Resistivity Tomography

Electrical Resistivity Tomography was carried out to provide information on lateral variations in the overburden material as well as on the underlying overburden and bedrock.

Principles

This surveying technique makes use of the Gradient resistivity array. The 2D-resistivity profiling method records a large number of resistivity readings in order to map lateral and vertical changes in material types. This method involves the use of electrodes connected to a resistivity meter, using computer software to control the process of data collection and storage.

Data Collection

Profiles were recorded using an ABEM LS4 resistivity meter, imaging software, four 21 takeout multicore cables and up to 64 stainless steel electrodes. Saline solution was used at the electrode/ground interface in order to gain a good electrical contact required for the technique to work effectively. The recorded data were processed and viewed immediately after surveying.

Data Processing
The field readings were stored in computer files and inverted using the RES2DINV package (Geotomo Software, 2006) with up to 5 iterations of the measured data carried out for each profile to obtain a 2D-depth model of the resistivities.

The inverted 2D resistivity models and corresponding interpreted geology are displayed on the accompanying drawings alongside the processed seismic sections. Profiles have been contoured using the same contour intervals and colour codes. Distance is indicated along the horizontal axis of the profiles.

Seismic refraction profiling

Principles
This method measures the velocity of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher seismic velocities while soft, loose or fractured materials have lower velocities.

Seismic profiling measures the p-wave velocity (Vp) of refracted seismic waves through the overburden and rock material and allows an assessment of the thickness and quality of the materials present to be made. Stiffer and stronger materials usually have higher Vp velocities while soft, loose or fractured materials have lower Vp velocities. Readings are taken using geophones connected via multi-core cable to a seismograph.

Data Collection
A Geode high resolution 24 channel digital seismograph, 24 x 10HZ vertical geophones and a 10 kg hammer were used to provide first break information, with a 24 take-out cable (2m spacing). Equipment was carried was operated by a two-person crew.

Readings are taken using geophones connected via multi-core cable to a seismograph. The depth of resolution of soil/bedrock boundaries is determined by the length of the seismic spread, typically the depth of resolution is about one third the length of the profile (eg. 46m profile ~15m depth). Shots from seven different positions were taken (2 x off-end, 2 x end, 3 x middle) to ensure optimum coverage of all refractors.

Data Processing
The recorded data was processed and interpreted using the ray-tracing and tomographic inversion methods, to acquire depths to boundaries and the P-wave velocities of these layers, using the SeisImager/2D programme from Geometrics.
SeisImager/2D interprets seismic refraction data as a laterally varying layered earth structure. The programme includes three methods for data analysis, time-term inversion, the reciprocal method and tomography.

The tomography method creates an initial velocity model, then traces rays through the model, comparing the calculated and measured traveltimes. The model is then modified and the process repeated to minimise the difference between the calculated and measured times. The data was processed using this method and was then converted to a layer model for display and interpretation.

Approximate errors for Vp velocities are estimated to be +/- 10%. Errors for the calculated layer thicknesses are of the order of +/-20%. Possible errors due to the "hidden layer" and "velocity inversion" effects may also occur (Soske, 1959).

Spatial Relocation & Survey Locations

All ERT and Seismic Refraction locations were acquired using a Trimble R10 high-accuracy GNSS handheld system using the settings listed below. This system allows collection of GPS data with c.20mm accuracy.

Projection:	Irish Transverse Mercator (ITM)
Datum:	IRENET95
Coordinate units:	Metres
Altitude units:	Metres
Survey altitude reference:	MSL
Geoid model:	OSGM15_Malin

APPENDIX B: EXCAVATABILITY

The seismic velocity of a rock formation is related to characteristics of the rock mass which include rock hardness and strength, degree of weathering and discontinuities. Usually the velocity is just one of several parameters used in the assessment of excavatability. The excavatability of a rock formation is favoured by the following factors:

- Open fractures, faults and other planes of weakness of any kind
- Weathering
- Brittleness and crystalline nature
- High degree of stratification or lamination
- Large grain size
- Low compressive strength

Weaver (1975) presented a comprehensive rippability rating chart (Fig.1) in which the p-wave velocity value and the relevant geological factors could be entered and assigned appropriate weightings. The total weighted index was found to correlate very well with actual rippability.

Fig.1 Rippability Rating Chart

Rock class	I	II	III	IV	V
Description	Very good rock	Good rock	Fair rock	Poor rock	Very poor rock
Seismic velocity (m/s)	>2150	2150-1850	1850-1500	1500-1200	1200-450
Rating	26	24	20	12	5
Rock hardness	Extremely hard rock	Very hard rock	Hard rock	Soft rock	Very soft rock
Rating	10	5	2	1	0
Rock weathering	Unweathered	Slightly weathered	Weathered	Highly weathered	Completely weathered
Rating	9	7	5	3	1
Joint spacing (mm)	>3000	3000-1000	1000-300	300-50	<50
Rating	30	25	20	10	5
Joint continuity	Non continuous	Slightly continuous	Continuous-no gouge	Continuous-some gouge	Continuous-with gouge
Rating	5	5	3	0	0
Joint gouge	No separation	Slight separation	Separation <1mm	Gouge <5mm	Gouge >5mm
Rating	5	5	4	3	1
Strike and dip orientation	Very unfavourable	Unfavourable	Slightly unfavourable	Favourable	Very favourable
Rating	15	13	10	5	3
Total rating	100-90	90-70*	70-50	50-25	<25
Rippability assessment	Blasting	Extremely hard ripping and blasting	Very hard ripping	Hard ripping	Easy ripping
Tractor horsepower		770/385	385/270	270/180	180
Tractor kilowatts		575/290	290/200	200/135	135

APPENDIX C: SEISMIC REFRACTION PLATES

The tomographic inversion plates for the seismic refraction spreads are shown below:

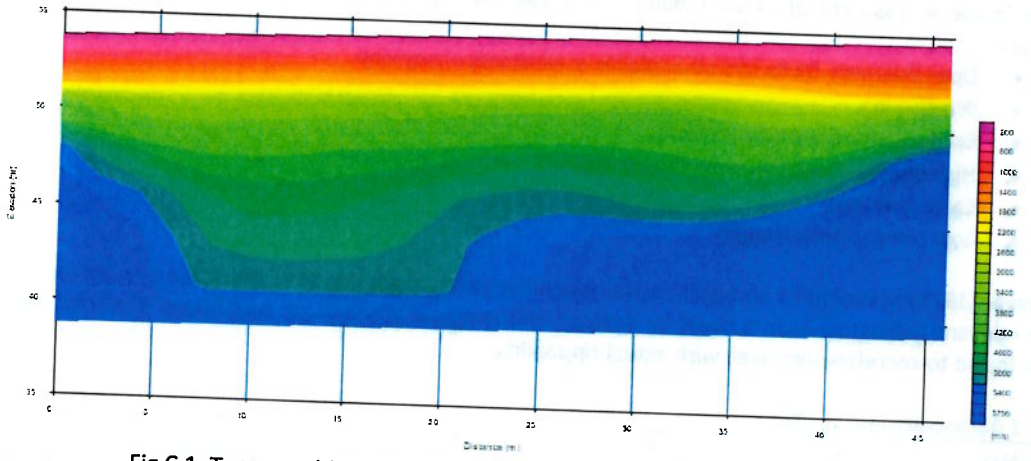


Fig.C.1. Tomographic inversion for seismic refraction spread S1 (SE-NW).

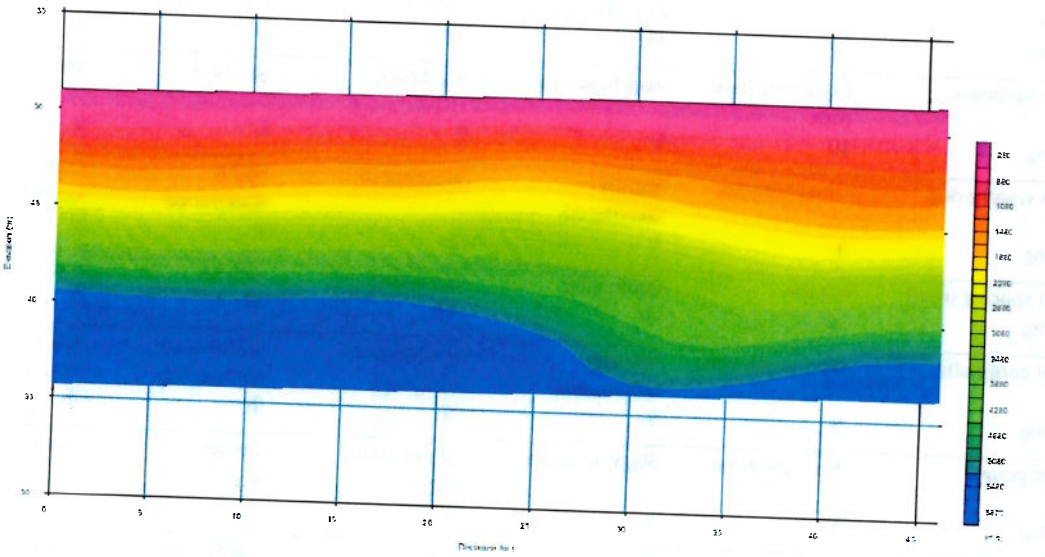


Fig.C.2. Tomographic inversion for seismic refraction spread S2 (SE-NW).

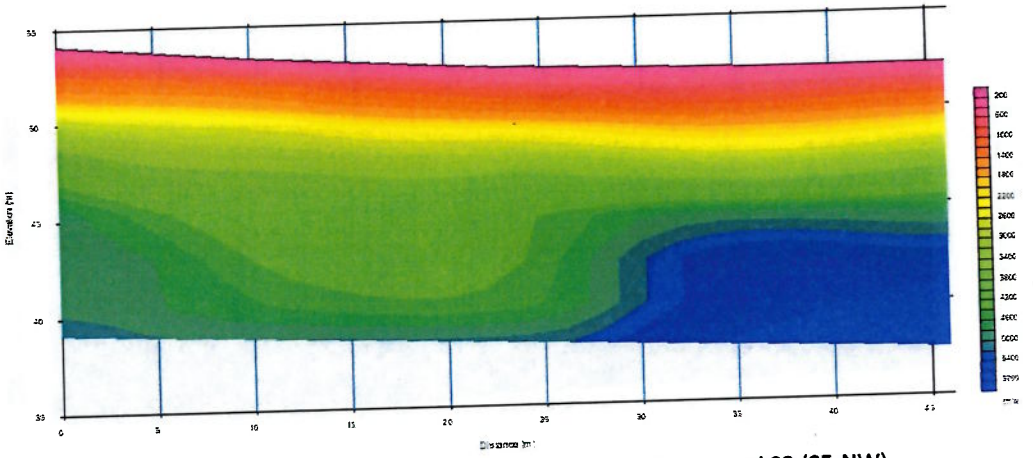


Fig.C.3. Tomographic inversion for seismic refraction spread S3 (SE-NW).

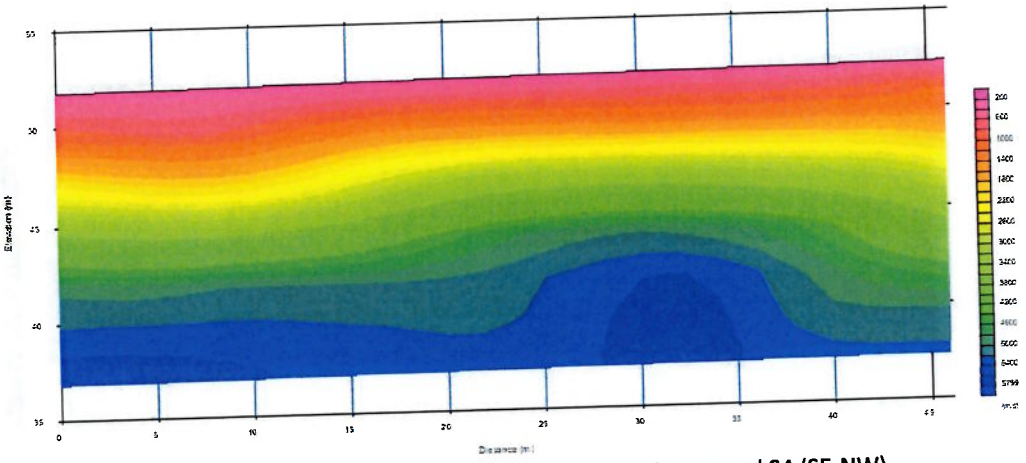


Fig.C.4. Tomographic inversion for seismic refraction spread S4 (SE-NW).

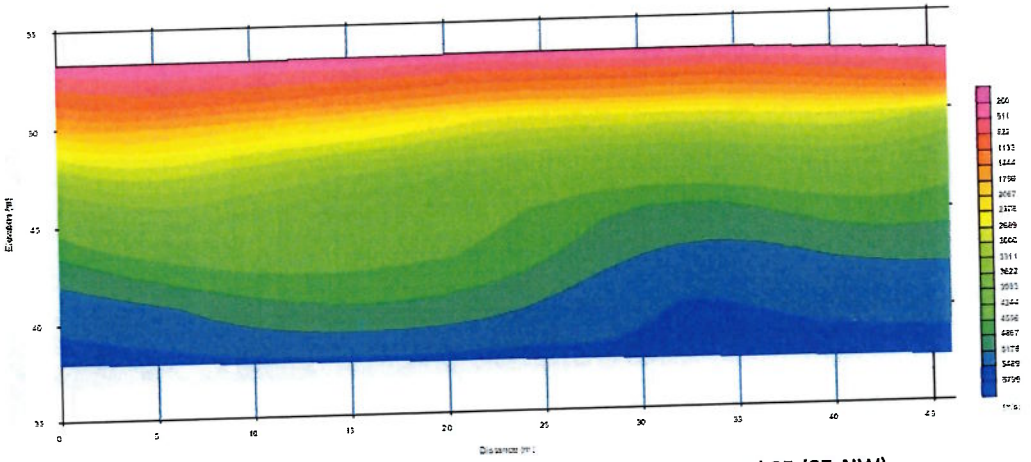


Fig.C.5. Tomographic inversion for seismic refraction spread S5 (SE-NW).

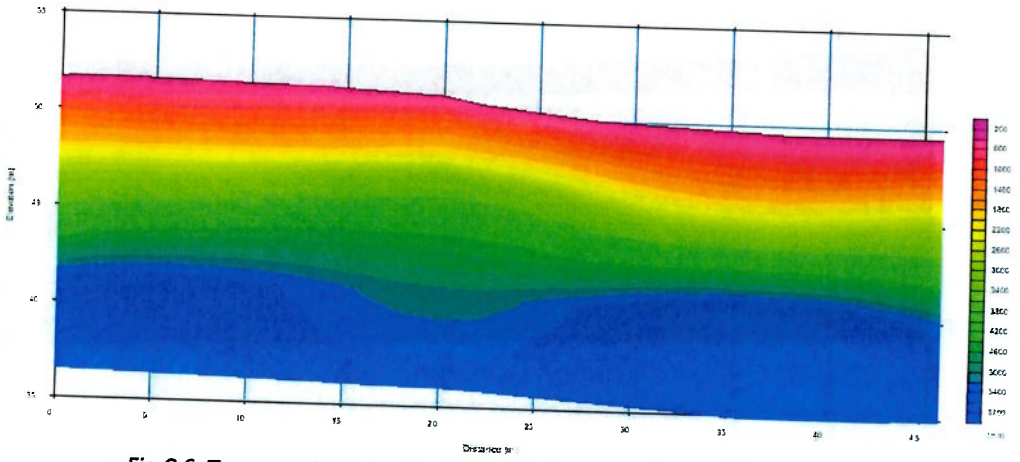


Fig.C.6. Tomographic inversion for seismic refraction spread S6 (SW-NE).

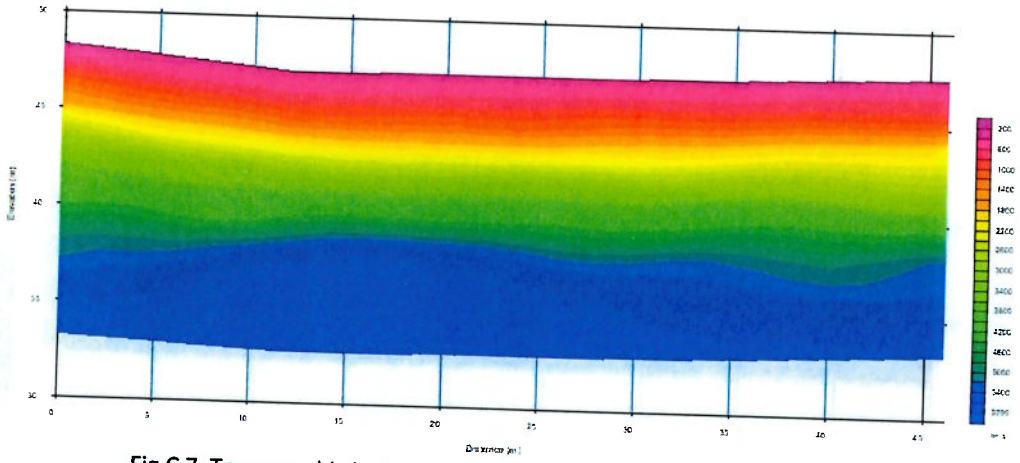


Fig.C.7. Tomographic inversion for seismic refraction spread S7 (SE-NW).

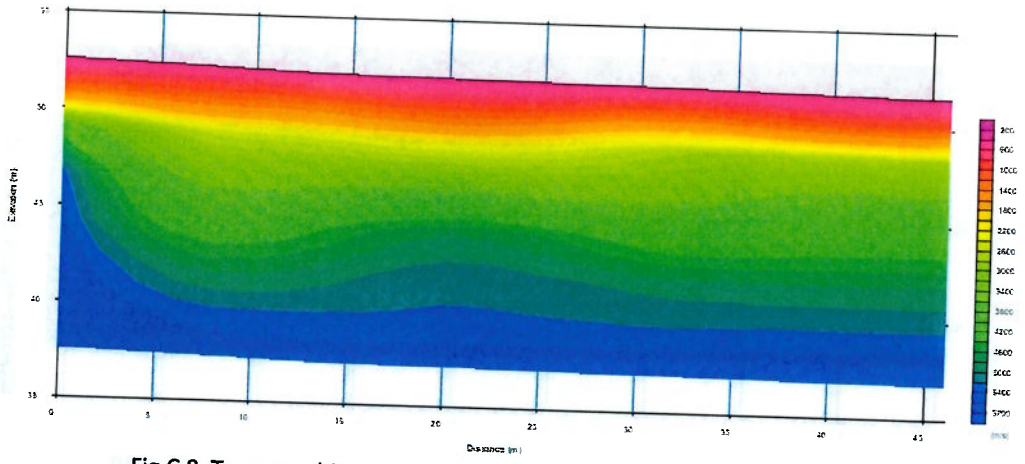


Fig.C.8. Tomographic inversion for seismic refraction spread S8 (SE-NW).

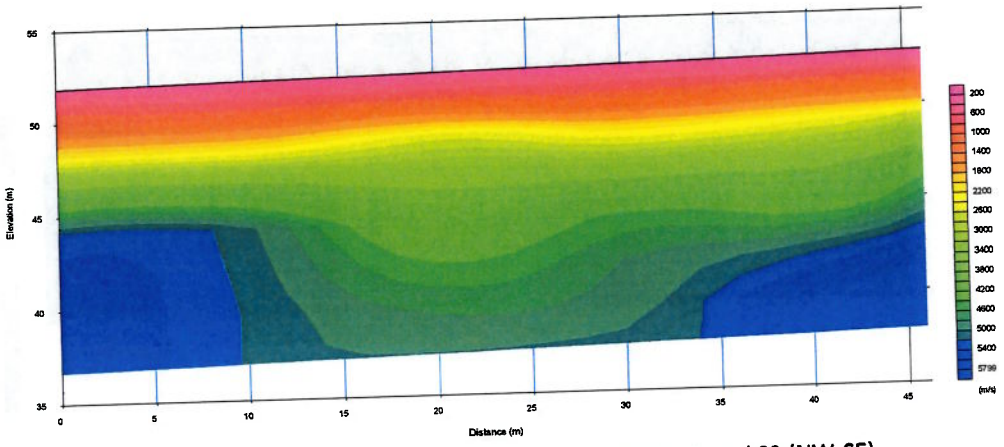


Fig.C.9. Tomographic inversion for seismic refraction spread S9 (NW-SE).

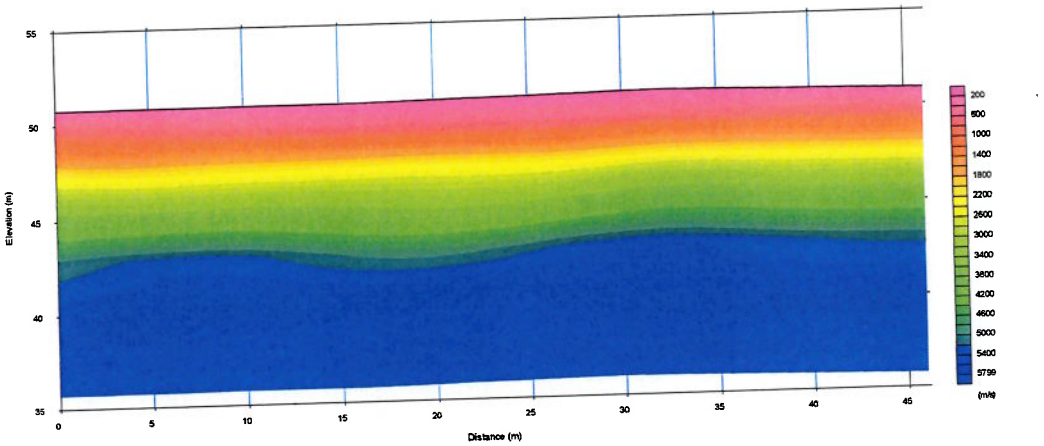


Fig.C.10. Tomographic inversion for seismic refraction spread S10 (SE-NW).

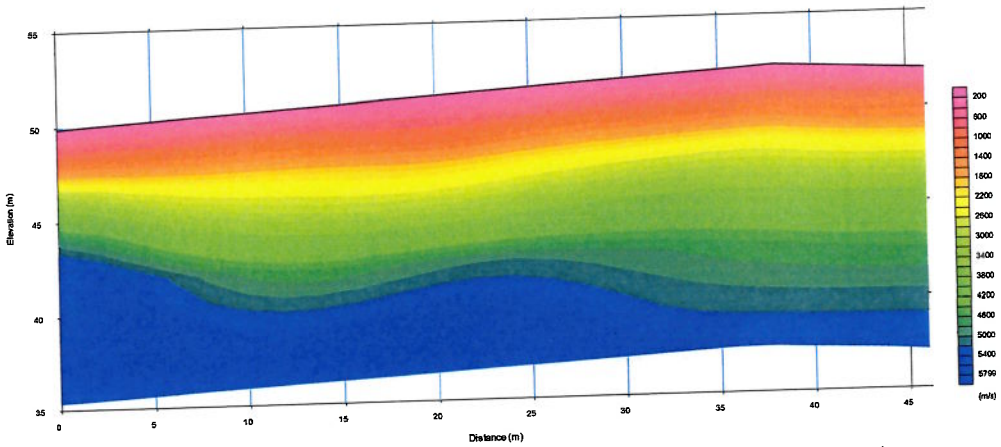


Fig.C.11. Tomographic inversion for seismic refraction spread S11 (NW-SE).

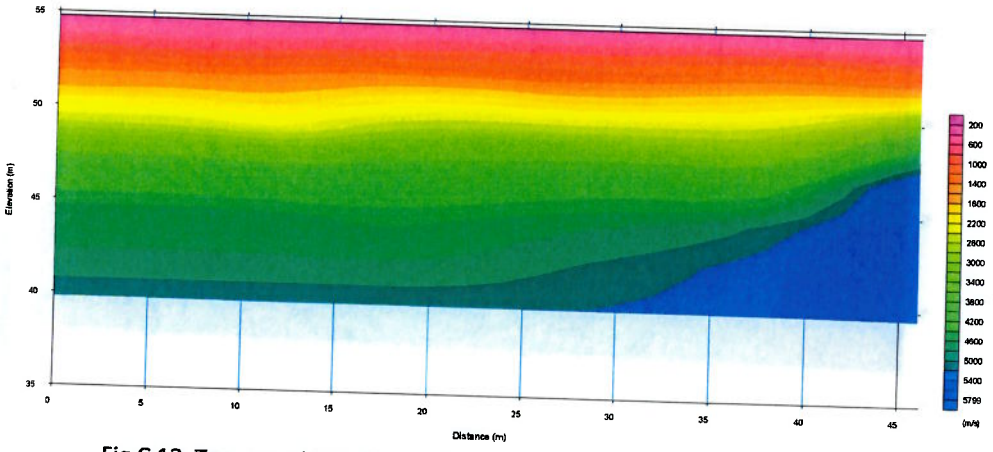


Fig.C.12. Tomographic inversion for seismic refraction spread S12 (NW-SE).

APPENDIX D: DRAWINGS

The information derived from the geophysical investigation in conjunction with the available direct investigation is presented in the following drawings:

AGP24105_01	Geophysical Survey Locations	1:4000@A4
AGP24105_02	EM Ground Conductivity Results (mS/m)	1:4000@A4
AGP24105_03	Interpreted Soil Thickness Layers 1 & 2 (m)	1:4000@A4
AGP24105_04	Interpreted Top of Slightly Weathered to Fresh Rock (mOD)	1:4000@A4
AGP24105_R1	Results & interpretation – R1 & S4	1:750@A4
AGP24105_R2	Results & interpretation – R2, S5 & S9	1:750@A4
AGP24105_R3	Results & interpretation – R3 & S6	1:750@A4
AGP24105_R4	Results & interpretation – R4, S1 & S12	1:750@A4
AGP24105_R5	Results & interpretation – R5, S7 & S11	1:750@A4
AGP24105_R6	Results & interpretation – R6 & S3	1:750@A4
AGP24105_R7	Results & interpretation – R7, S2, S8 &S10	1:2000@A4

GEOPHYSICAL SURVEY LOCATIONS

SCALE 1:4000



INDEX MAP:



LEGEND:

- Site
- EM conductivity reading
- R1 — ERT profile
- S1 — Seismic refraction profile
- BH1 — Borehole
- TP1 — Trial pit, soakaway pit

The information displayed here is to be used in conjunction with AGP24105_01 Report on the Geophysical Investigation at Coolpowra Power Plan, Co. Galway, for GII Ltd., APEX Geophysics Ltd., 06/12/2024.

apex geophysics

6 Knockmullen Business Park
Gorey
Co. Wexford
Ireland

T +353 (0)402-21842
E info@apexgeophysics.ie
www.apexgeophysics.ie

PROJECT	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
CLIENT	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO	AGP24105_01
SCALE	AS INDICATED @ A4
DATE	06-12-2024

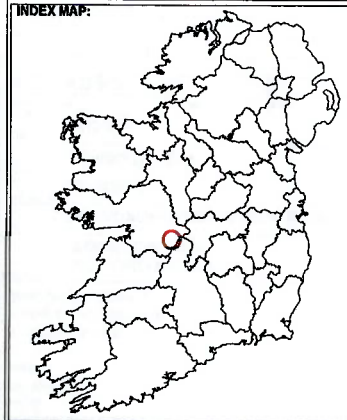
Version	Date	Drawn By	Checked
01	06-12-2024	SC	TL

EM GROUND CONDUCTIVITY RESULTS (mS/m)

SCALE 1:4000



INDEX MAP:



LEGEND:

Site

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

(mS/m)

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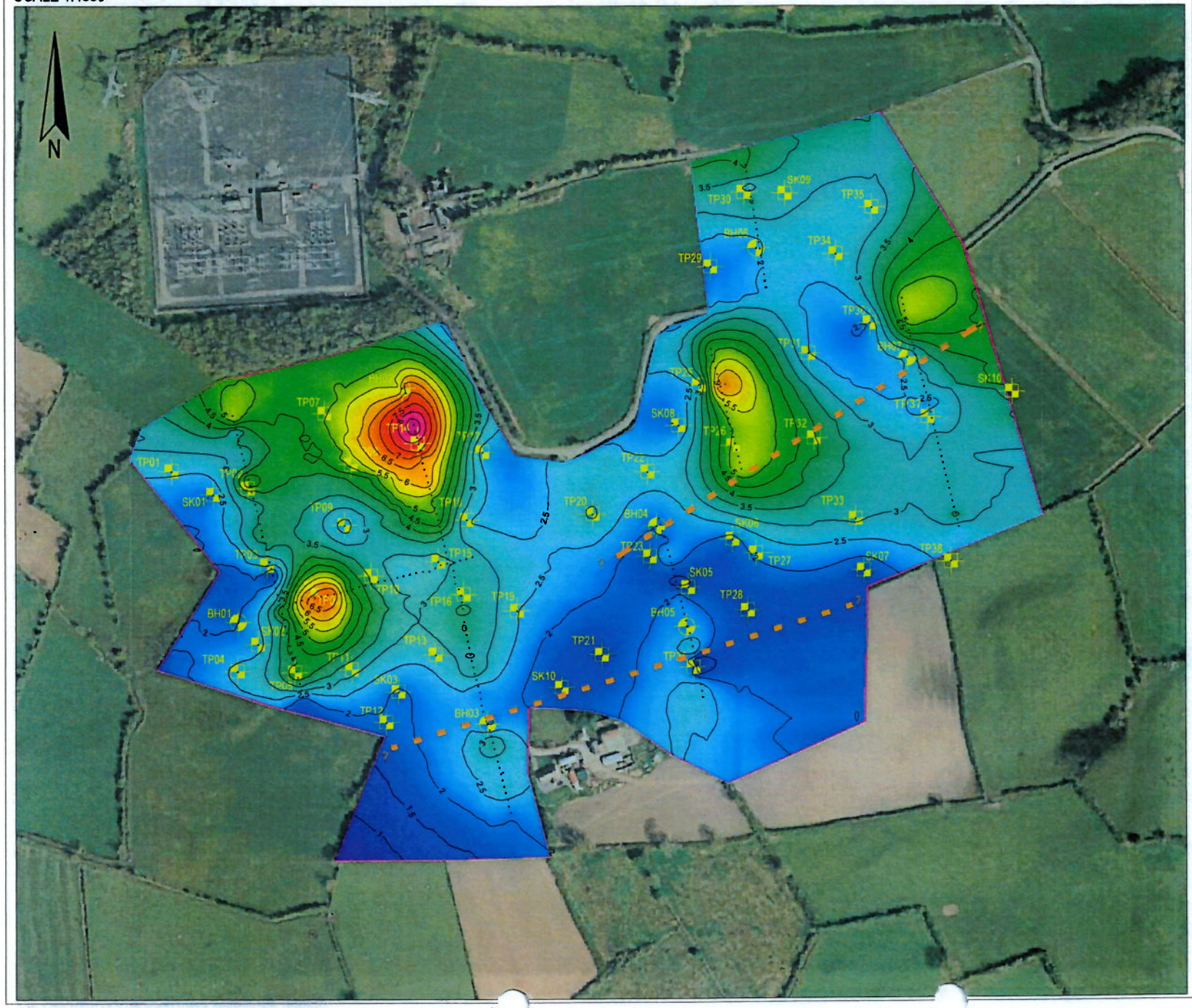
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PROJECT	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
CLIENT.:	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO:	AGP24105_02
SCALE	AS INDICATED @ A4
DATE	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

INTERPRETED SOIL THICKNESS LAYERS 1 & 2 (m)

SCALE 1:4000



INDEX MAP:



LEGEND:

Site

Data point

1 2 3 4 5 6 7 8 9

(m)

borehole

trial pit, soakaway pit

Possible fault

Maps displayed here are produced based on interpolation and extrapolation between discrete data points and should be used accordingly.

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6 Knockmullen Business Park
Gorey
Co. Wexford
Ireland

T +353 (0)402-21842
E info@apexgeophysics.ie
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PROJECT	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
CLIENT	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO	AGP24105_03
SCALE	AS INDICATED @ A4
DATE	06-12-2024

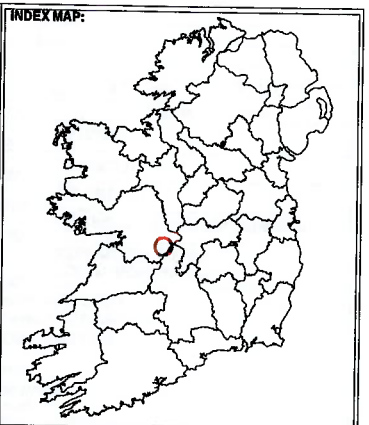
Version	Date	Drawn By	Checked
01	06-12-2024	SC	TL

INTERPRETED TOP OF SLIGHTLY WEATHERED TO FRESH ROCK (mOD)

SCALE 1:4000



INDEX MAP:



LEGEND:

Site

Data point

41 42 43 44 45 46 47 48 49 50 51 52 53

(mOD)

borehole

trial pit, soakaway pit

Possible fault

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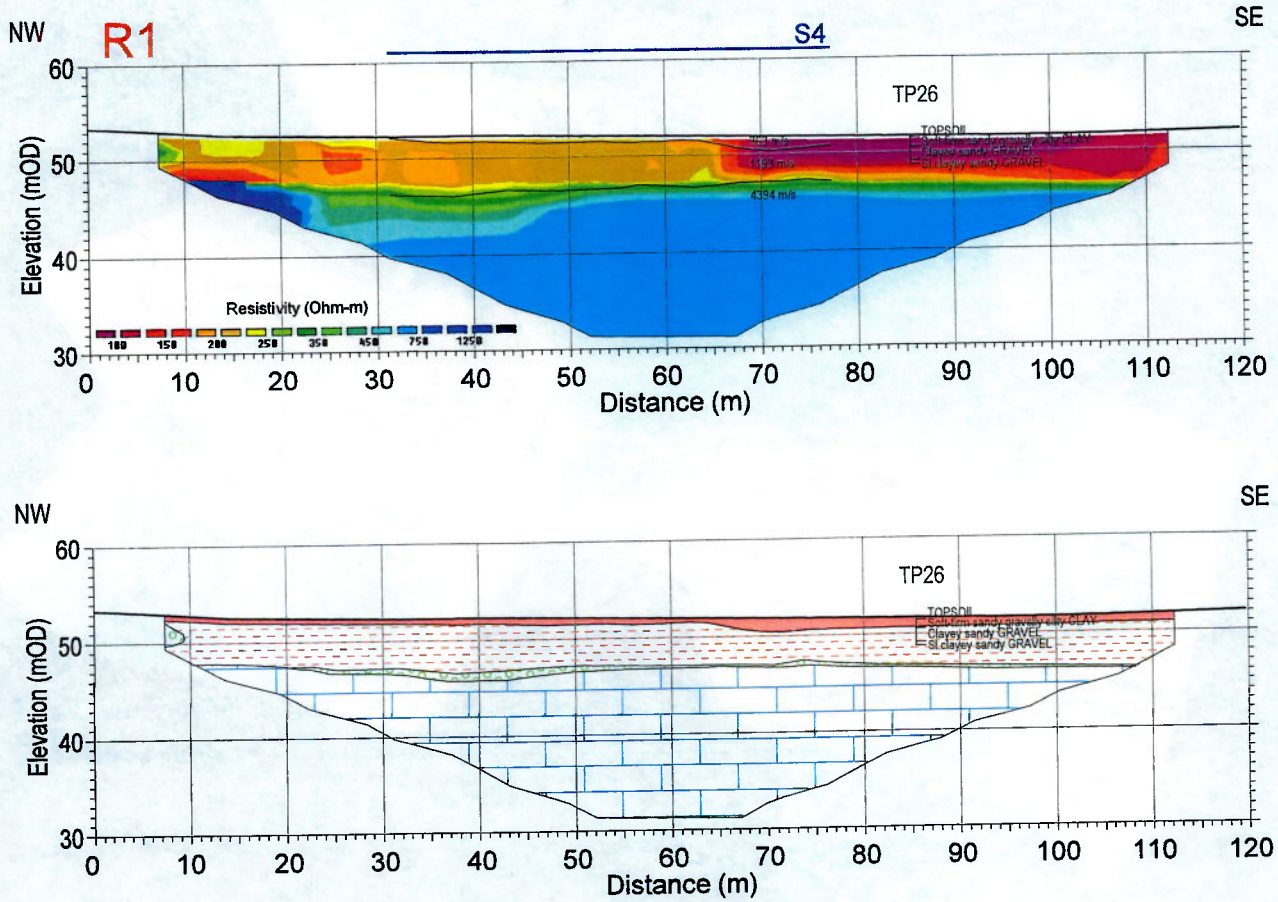
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PROJECT:	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
CLIENT:.	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO:	AGP24105_04
SCALE:	AS INDICATED @ A4
DATE:	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R1 & S4

SCALE 1:750



INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

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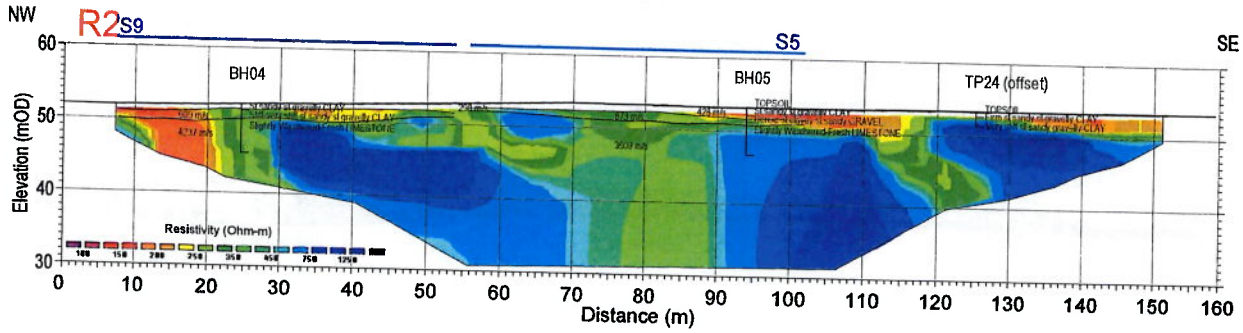
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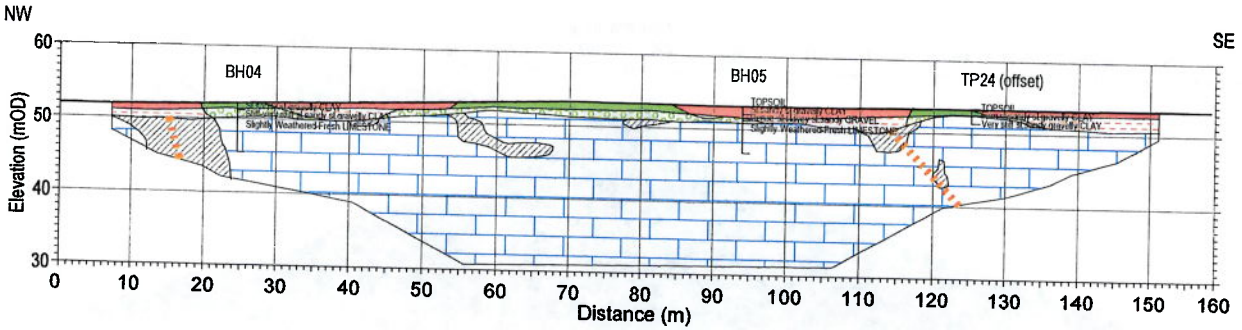
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CLIENT.	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO	AGP24105_R1
SCALE	AS INDICATED @ A4
DATE	06-12-2024

Version.	Date	Drawn By	Checked
01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R2, S9 & S5

SCALE 1:1000





INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

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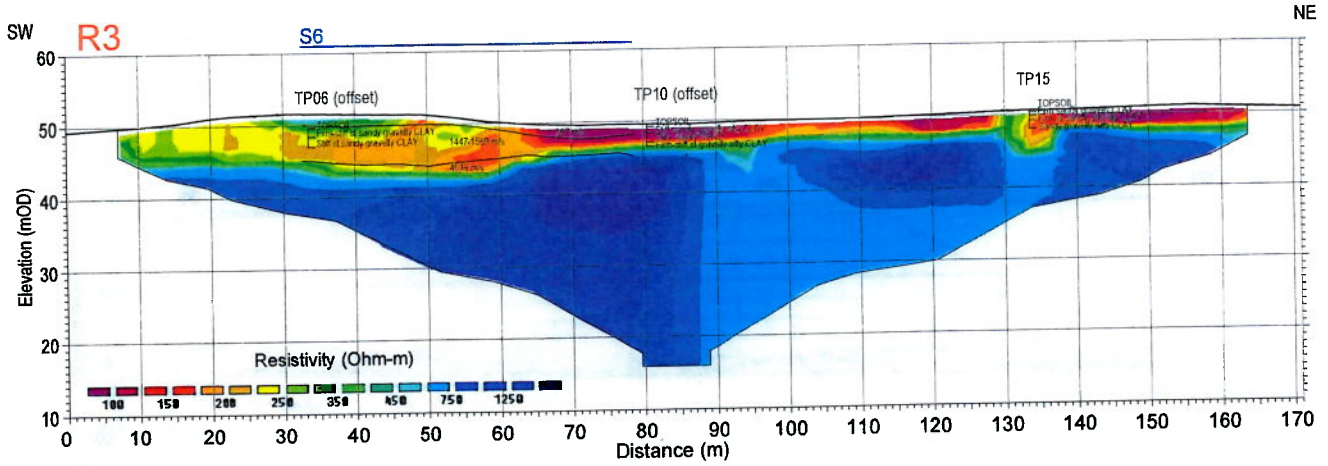
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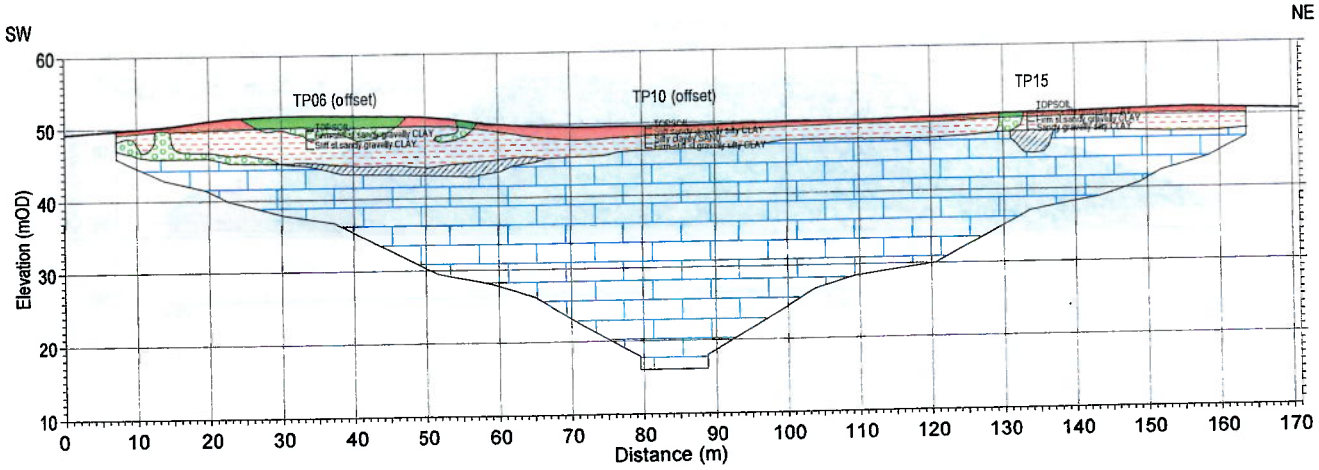
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SCALE:	AS INDICATED @ A4
DATE:	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R3 & S6

SCALE 1:1000







LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

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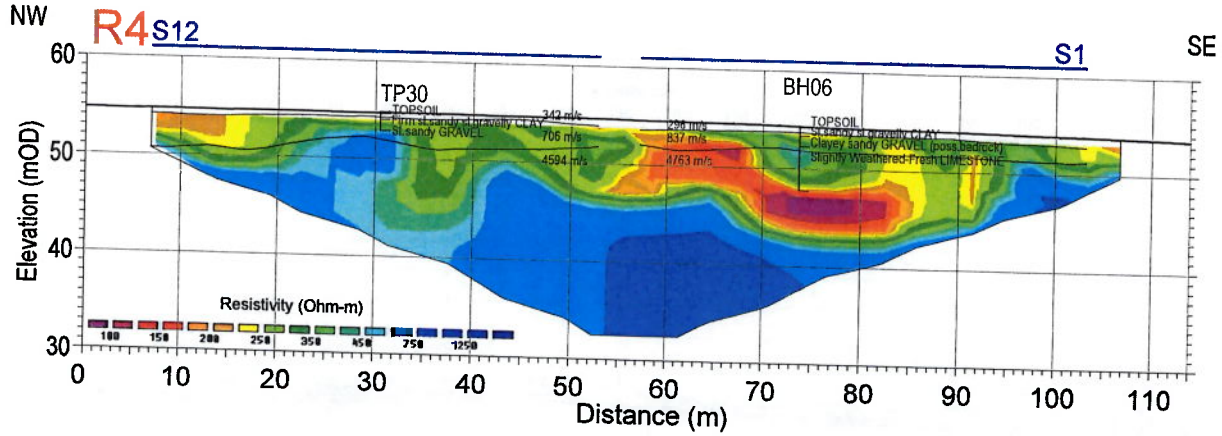
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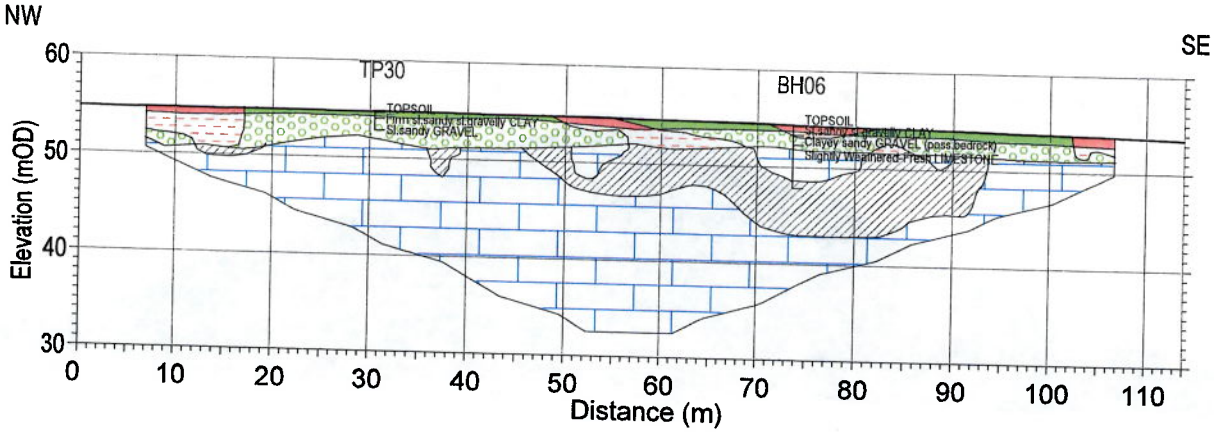
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PROJECT:	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
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DRAWING NO:	AGP24105_R3
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DATE:	06-12-2024

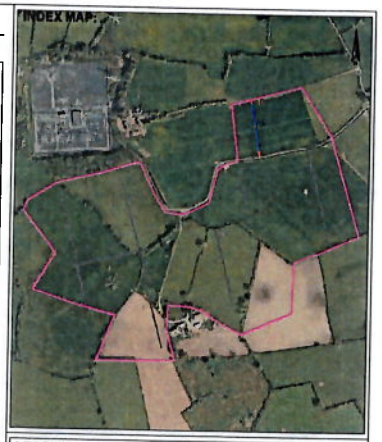
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01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R4, S12 & S1
SCALE 1:750





INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

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Co. Wexford
Ireland

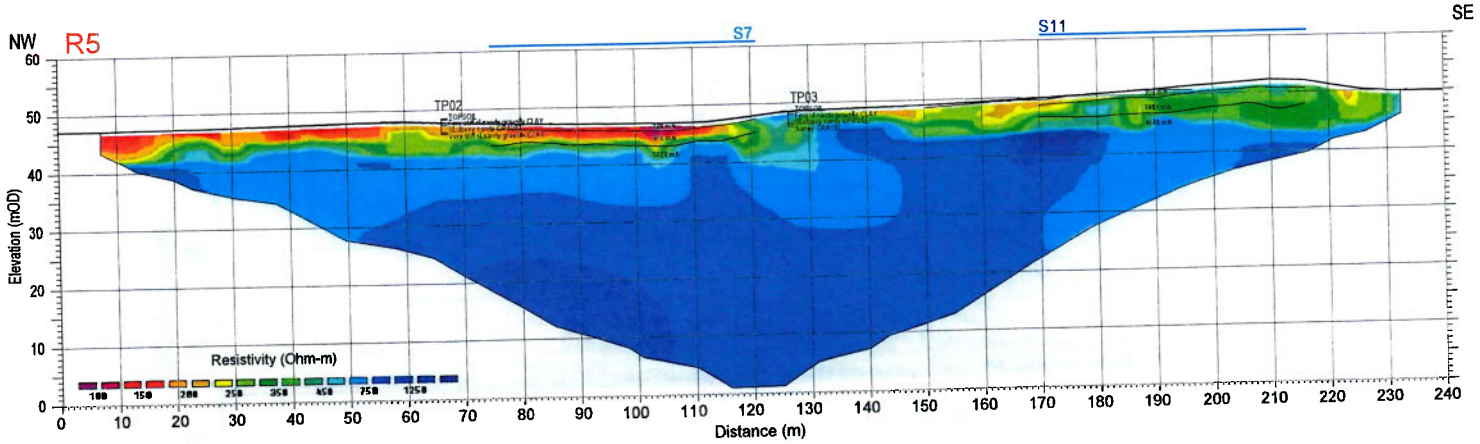
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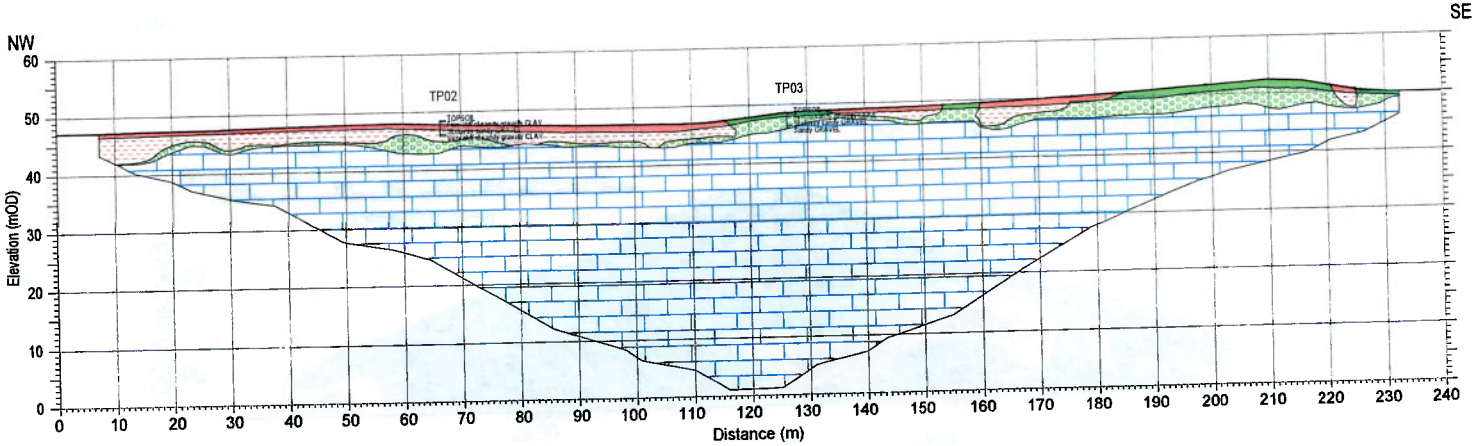
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SCALE:	AS INDICATED @ A4
DATE:	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R5, S7 & S11

SCALE 1:1250





INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 Direct investigation location

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Gorey
Co. Wexford
Ireland

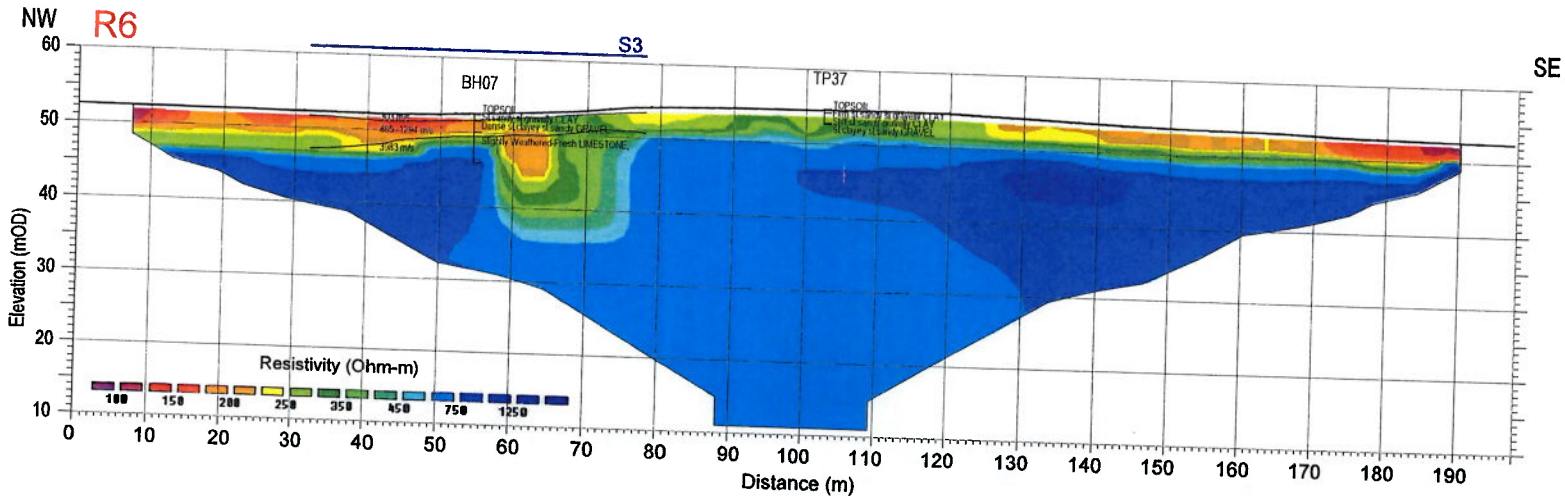
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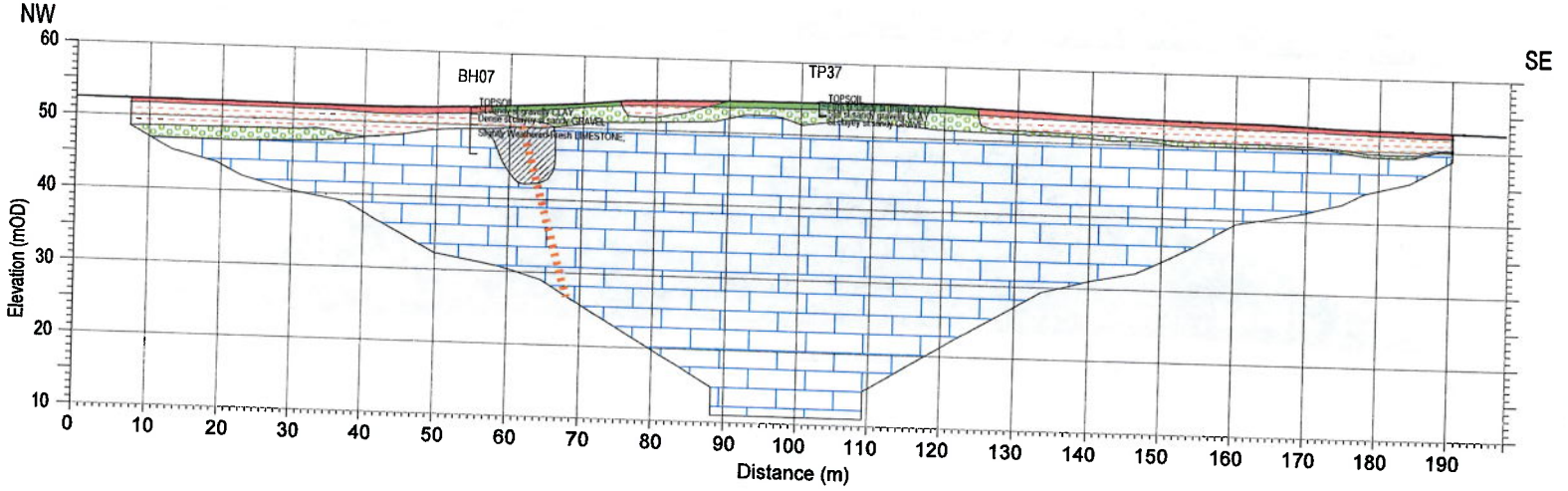
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CLIENT:	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO	AGP24105_R5
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DATE	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

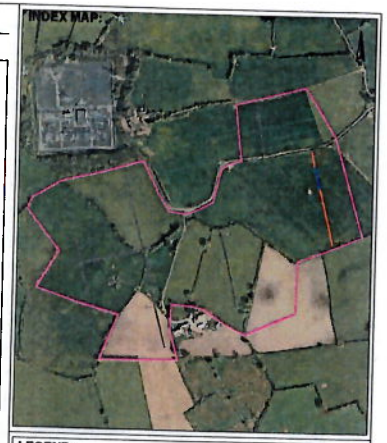
RESULTS & INTERPRETATION - R6 & S3

SCALE 1:1000





INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

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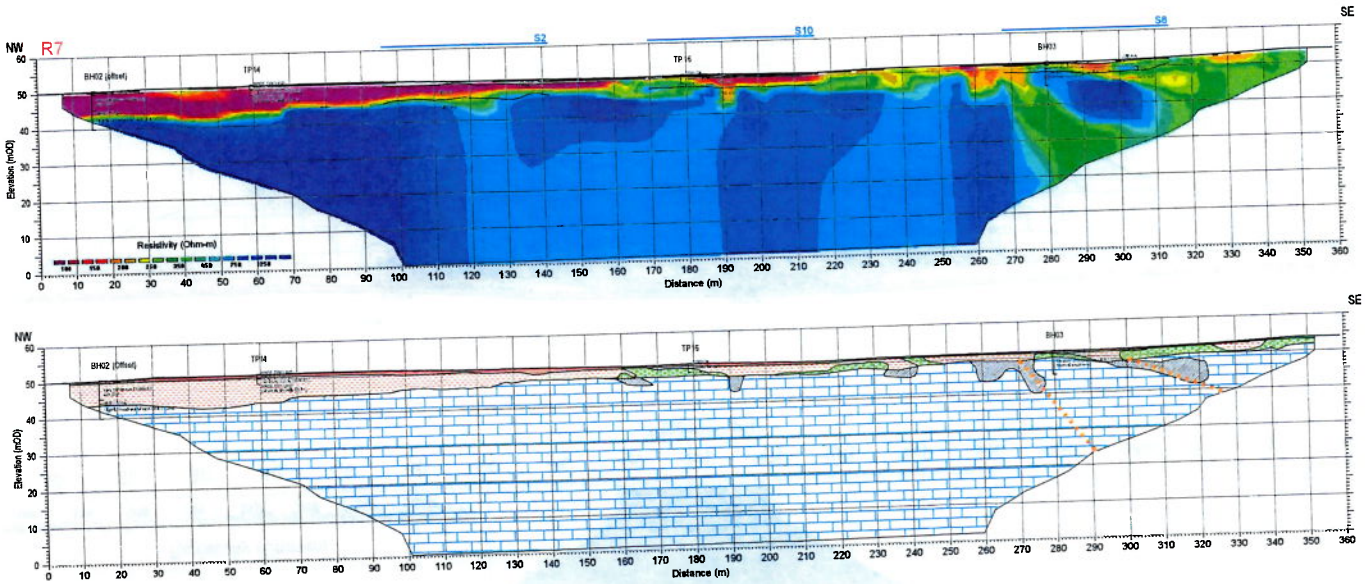
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CLIENT:	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO:	AGP24105_R6
SCALE:	AS INDICATED @ A4
DATE:	06-12-2024

Version:	Date:	Drawn By:	Checked:
01	06-12-2024	SC	TL

RESULTS & INTERPRETATION - R7, S2, S10 & S8

SCALE 1:2000



INDEX MAP:



LEGEND:

- Soft sandy gravelly CLAY
- Firm-Stiff Sandy gravelly CLAY
- Loose clayey SAND/GRAVEL
- Medium dense-Dense clayey SAND/GRAVEL or Highly to Moderately weathered ROCK
- Slightly weathered-Fresh MUDSTONE/SHALE
- Slightly weathered-Fresh dark LIMESTONE with thin interbedded Shales
- Possible Fault
- BH1 — Direct investigation location

The information displayed here is to be used in conjunction with AGP24105_01 Report on the Geophysical Investigation at Coolpowra Power Plan, Co. Galway, for GII Ltd., APEX Geophysics Ltd., 06/12/2024.

apex geophysics

6 Knockmullen Business Park
Gorey
Co. Wexford
Ireland

T +353 (0)402-21842
E info@apexgeophysics.ie
www.apexgeophysics.ie

PROJECT:	COOLPOWRA POWER PLANT GEOPHYSICAL SURVEY
CLIENT:	GROUND INVESTIGATIONS IRELAND LTD
DRAWING NO.	AGP24105_R7
SCALE:	AS INDICATED @ A4
DATE:	06-12-2024

Version:	Date	Drawn By:	Checked:
01	06-12-2024	SC	TL