

Appendix B Geotechnical In-Situ and Laboratory Testing

Appendix B.1 Classification

Classification based on SPT “N” values:

The inferred undrained strength of the cohesive soils was based on the SPT “N” blow counts, derived from the relationship suggested by Stroud (1974) and classified using Table B.1.1. (Ref: Stroud, M. A. 1974, “The Standard Penetration Test – its application and interpretation”, Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.).

Table B.1.1 SPT “N” Blow Count Cohesive Classification

Classification	Undrained Cohesive Strength C_u (kPa)
Extremely low	<10
Very low	10 – 20
Low	20 – 40
Medium	40 – 75
High	75 – 150
Very high	150 – 300
Extremely high	> 300

Note: (Ref: BS EN ISO 14688-2:2004+A1:2013 Clause 5.3.)

The relative density of granular soils was classified based of the relationship given in Table B.1.2.

The *UK National Annex to Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing*, NA 3.7 SPT test, BS EN 1997-2:2007, Annex F states “Relative density descriptions on borehole records should also be based on uncorrected SPT N values, unless significantly disturbed, using the density classification in BS 5930:2015, Table 7.

Table B.1.2 SPT “N” Blow Count Granular Classification

Classification	SPT “N” blow count (blows/300mm)
Very loose	0 to 4
Loose	4 to 10
Medium dense	10 to 30
Dense	30 to 50
Very dense	Greater than 50

Note: (Ref: The Standard Penetration Test (SPT): Methods and Use, CIRIA Report 143, 1995)

Classification of DCP results to CBR:

The DCP consists of a cone fixed to the bottom of a 575mm vertical rod. An 8kg weight is repeatedly lifted and dropped onto an anvil at the mid-height of the rod to deliver a 'blow'. A vertical scale alongside the rod is used to measure the depth of penetration of the cone. These measurements are then converted to CBR values using the following equation derived from the DTP Interim Advice Note 73/06 – Design Guidance for Road Pavement Foundations:

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

Appendix B.2 Interpretation

Table B.2.1 Interpretation of DPSH Blow Counts

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP01	RTD 0.50 – 1.40 Sandy CLAY	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
	RTD 1.40 – 4.70 Gravelly SAND	4 – 29	Loose to medium dense
	LC 4.70 – 6.00 Silty CLAY ¹	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
DP02	RTD 0.50 – 2.30 Sandy CLAY	4 – 25	Low to high ($C_u = 20 - 125\text{kPa}$)
	RTD 2.30 – 3.40 Gravelly SAND	4 – 29	Loose to medium dense
	LC 3.40 – 4.00 Silty CLAY ¹	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)
DP03	ALV 0.50 – 2.00 Sandy CLAY	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
	LC 2.00 – 6.00 Silty CLAY ¹	4 – 29	Low to high ($C_u = 20 - 145\text{kPa}$)
DP04	RTD 0.50 – 1.50 Sandy CLAY	4 – 20	Low to high ($C_u = 20 - 100\text{kPa}$)
	RTD 1.50 – 4.20 Gravelly SAND ¹	0 – 20	Very loose to medium dense
	LC 4.20 – 6.00 Silty CLAY ¹	4 – 29	Low to high ($C_u = 20 - 145\text{kPa}$)
DP05	RTD 0.80 – 2.20 Clayey SAND	4 – 8	Loose
	RTD 2.20 – 3.70 Sandy CLAY	4 – 21	Low to high ($C_u = 20 - 105\text{kPa}$)
	LC 3.70 – 6.00 Silty CLAY ¹	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)
DP06	ALV 0.50 – 2.60 Sandy CLAY	0 – 8	Extremely low to Low ($C_u = <10 - 40\text{kPa}$)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP07	LC 2.60 – 6.00 Silty CLAY	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)
	ALV 0.50 – 1.80 Sandy CLAY	0 – 4	Extremely low to very low ($C_u = <10 - 20\text{kPa}$)
	RTD 1.80 – 2.00 Sandy gravelly CLAY	7	Low ($C_u = 35\text{kPa}$)
	RTD 2.00 – 3.80 SAND	4 – 11	Loose to medium dense
DP08	LC 3.80 – 6.00 Silty CLAY ¹	7 – 14	Low to medium ($C_u = 35 - 70\text{kPa}$)
	ALV 0.50 – 2.00 Sandy CLAY	0 – 7	Extremely low to low ($C_u = <10 - 35\text{kPa}$)
	RTD 2.00 – 3.60 Sandy CLAY	4 – 11	Low to medium ($C_u = 20 - 55\text{kPa}$)
	LC 3.60 – 6.00 Silty CLAY ¹	7 – 11	Low to medium ($C_u = 35 - 55\text{kPa}$)
DP09	RTD 0.50 – 1.30 Sandy gravelly CLAY	0 – 4	Extremely low to very low ($C_u = <10 - 20\text{kPa}$)
	RTD 1.30 – 1.90 Gravelly SAND	4 – 7	Loose
	LC 1.90 – 6.00 Silty CLAY ¹	4 – 14	Low to medium ($C_u = 20 - 70\text{kPa}$)
DPI0	ALV 0.60 – 2.00 Sandy CLAY	0 – 4	Extremely low to very low ($C_u = <10 - 20\text{kPa}$)
	LC 2.00 – 6.00 Silty CLAY ¹	4 – 14	Low to medium ($C_u = 20 - 70\text{kPa}$)
DPI1	ALV 0.50 – 2.30 Sandy CLAY	0 – 7	Extremely low to low ($C_u = <10 - 35\text{kPa}$)
	LC 2.30 – 6.00 Silty CLAY ¹	7 – 14	Low to medium ($C_u = 35 - 70\text{kPa}$)
DPI2	ALV 0.60 – 1.90 Clayey GRAVEL	0 – 8	Very loose to loose
	LC 1.90 – 6.00 Silty CLAY ¹	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DPI3	RTD 1.00 – 1.70 Sandy GRAVEL	0 – 16	Very loose to medium dense
	RTD 1.70 – 3.80 Gravelly CLAY	0 – 8	Extremely low to low ($C_u = <10 - 40\text{kPa}$)
	LC 3.80 – 6.00 Silty CLAY ¹	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
DPI4	HEAD 0.50 – 4.10 Sandy CLAY ¹	0 – 12	Extremely low to medium ($C_u = <10 - 60\text{kPa}$)
	LC 4.10 – 6.00 Silty CLAY ¹	8 – 12	Medium ($C_u = 40 - 60\text{kPa}$)
DPI5	RTD 0.50 – 0.90 Clayey GRAVEL	0 – 25	Very loose to medium dense
	RTD 0.90 – 2.50 Gravelly CLAY	0 – 8	Extremely low to low ($C_u = <10 - 40\text{kPa}$)
	LC 2.50 – 6.00 Silty CLAY ¹	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
DPI6	RTD 0.50 – 1.00 Clayey GRAVEL	25 – 45	Medium dense to dense
	LC 1.00 – 6.00 Silty CLAY ¹	4 – 20	Low to high ($C_u = 20 - 100\text{kPa}$)
DPI7	HEAD 1.00 – 2.50 Gravelly SAND	4 – 16	Loose to medium dense
	HEAD 2.50 – 2.70 CLAY	4	Low ($C_u = 20\text{kPa}$)
	HEAD 2.50 – 3.80 SAND and GRAVEL	0 – 8	Very loose to loose
	LC 3.80 – 6.00 Silty CLAY ¹	4 – 12	Low to medium ($C_u = 20 - 60\text{kPa}$)
DPI8	HEAD 0.50 – 3.10 Sandy gravelly CLAY	0 – 8	Extremely low to low ($C_u = <10 - 40\text{kPa}$)
	LC 3.10 – 6.00 Silty CLAY ¹	4 – 8	Low ($C_u = 20 - 40\text{kPa}$)
DPI9	RTD 0.50 – 1.90 Clayey GRAVEL	16 – 29	Medium dense

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP20	LC 1.90 – 6.00 Silty CLAY ¹	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)
	HEAD 1.00 – 1.60 SAND	0 – 4	Very loose
	HEAD 1.60 – 2.00 Sandy gravelly CLAY	0 – 4	Extremely low to very low ($C_u = <10 - 20\text{kPa}$)
DP21	LC 2.00 – 6.00 Silty CLAY ¹	4 – 14	Low to medium ($C_u = 20 - 70\text{kPa}$)
	HEAD 1.00 – 1.80 Clayey gravelly SAND	12 – 33	Medium dense to dense
	HEAD 1.80 – 2.70 Sandy gravelly CLAY	4	Low ($C_u = 20\text{kPa}$)
DP22	LC 2.70 – 6.00 Silty CLAY ¹	4 – 16	Low to high ($C_u = 20 - 80\text{kPa}$)
	HEAD 0.50 – 2.20 Gravelly CLAY	0 – 7	Extremely low to low ($C_u = <10 - 35\text{kPa}$)
	LC 2.20 – 6.00 Silty CLAY ¹	4 – 18	Low to high ($C_u = 20 - 90\text{kPa}$)
DP23	HEAD 0.50 – 1.70 Gravelly CLAY	0 – 7	Extremely low to low ($C_u = <10 - 35\text{kPa}$)
	HEAD 1.70 – 3.20 Silty SAND	0 – 7	Very loose to loose
	LC 3.20 – 6.00 Silty CLAY ¹	7 – 18	Low to high ($C_u = 35 - 90\text{kPa}$)
DP24	HEAD 0.50 – 1.10 Clayey GRAVEL	0 – 11	Very loose to medium dense
	HEAD 1.10 – 4.10 Silty sandy CLAY	0 – 7	Extremely low to low ($C_u = <10 - 35\text{kPa}$)
	LC 4.10 – 6.00 Silty CLAY ¹	11 – 22	Medium to high ($C_u = 55 - 110\text{kPa}$)
DP25	HEAD 0.50 – 1.90 Sandy gravelly CLAY	4 – 33	Low to very high ($C_u = 20 - 165\text{kPa}$)
	HEAD 1.90 – 2.60 SAND	4 – 18	Loose to medium dense

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP26	RTD 2.60 – 4.00 Gravelly SAND ¹	22 – >50	Medium dense to very dense
	HEAD 0.50 – 1.60 Silty gravelly CLAY	12 – 41	Medium dense to dense
	HEAD 1.60 – 2.50 GRAVEL / SAND	8 – 12	Loose to medium dense
	RTD 2.50 – 4.50 Gravelly SAND ¹	20 – >50	Medium dense to very dense
DP27	HEAD 0.50 – 2.00 GRAVEL / SAND	7 – 29	Loose to medium dense
	HEAD 2.00 – 3.60 Silty SAND	0 – 11	Very loose to medium dense
	RTD 3.60 – 4.60 Gravelly SAND ¹	18 – >50	Medium dense to very dense
	HEAD 0.50 – 1.60 Clayey GRAVEL ¹	7 – 25	Loose to medium dense
DP28	HEAD 1.60 – 3.70 Clayey SAND ¹	4 – 14	Loose to medium dense
	RTD 3.70 – 4.90 Gravelly SAND ¹	22 – >50	Medium dense to very dense

Note: ¹ Ground conditions inferred past the base of windowless sampler boreholes.

Table B.2.2 Interpretation of Atterberg Limit Tests

Stratum	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Soil Classification	Volume Change Potential	
						BRE	NHSC
ALV (6No.)	14 – 33	17 – 38	89 – 100	15 – 38	CL – CH	Low to medium	Low to medium
HEAD (8No.)	15 – 33	12 – 48	39 – 100	6 – 48	CL – CV	Low to high	None to high
RTD (7No.)	12 – 33	19 – 47	87 – 100	17 – 47	CL – CV	Low to high	Low to high
LC (3No.)	25 – 31	38 – 50	100	38 – 50	CH – CV	Medium to high	Medium to high

Stratum	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Soil Classification	Volume Change Potential	
						BRE	NHBC

Note: BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)

NHBC Volume Change Potential refers to NHBC Standards Chapter 4.2

Soils Classification based on British Soil Classification System

The most common use of the term clay is to describe a soil that contains enough clay-sized material or clay minerals to exhibit cohesive properties. The fraction of clay-sized material required varies, but can be as low as 15%. Unless stated otherwise, this is the sense used in Digest 240. The term can be used to denote the clay minerals. These are specific, naturally occurring chemical compounds, predominately silicates. The term is often used as a particle size descriptor. Soil particles that have a nominal diameter of less than 2 µm are normally considered to be of clay size, but they are not necessarily clay minerals. Some clay minerals are larger than 2 µm and some particles, 'rock flour' for example, can be finer than 2 µm but are not clay minerals.

(The Atterberg Limit Tests were undertaken in accordance with BS 1377:Part 2:1990 Clauses 3.2, 4.3 and 5)

Table B.2.3 Interpretation of PSD Tests

Location	Depth (m bgl)	Soil Description (Stratum)	Volume Change Potential		Passing 63µm Sieve (%)
			BRE	NHBC	
WS01	2.00	Brown slightly fine gravelly clayey/silty fine to coarse SAND (RTD)	No	No	10
WS04	1.90	Brown clayey/silty fine to coarse SAND (RTD)	No	No	10
WS05	1.60	Brown slightly fine to medium gravelly fine to coarse sandy SILT/CLAY (RTD)	Yes	Yes	53
WS09	1.50	Brown slightly fine to medium gravelly slightly clayey/silty fine to coarse SAND (RTD)	No	No	7
WS12	1.60	Off white slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (ALV)	No	No	6
WS13	1.10	Grey slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (RTD)	No	No	4
WS19	1.20	Off white clayey/silty fine to coarse sandy fine to coarse GRAVEL (RTD)	No	No	10
WS20	1.20	Brown slightly fine to medium gravelly clayey/silty fine to coarse SAND (HEAD)	No	No	15
WS21	1.50	Brown fine to coarse gravelly clayey/silty fine to coarse SAND (HEAD)	Yes	No	18
WS23	2.10	Brown slightly fine gravelly clayey/silty fine to coarse SAND (HEAD)	Yes	No	29

Location	Depth (m bgl)	Soil Description (Stratum)	Volume Change Potential		Passing 63µm Sieve (%)
			BRE	NHBC	
WS25	2.00	Brown slightly fine to coarse gravelly clayey/silty fine to coarse SAND (HEAD)	No	No	14
WS27	1.70	Orange brown clayey/silty fine to coarse SAND (HEAD)	Yes	No	17
WS28	0.90	Brown slightly clayey/silty slightly fine to coarse sandy fine to coarse GRAVEL (HEAD)	No	No	4

Note: BRE 240 states that a soil has a volume change potential when the clay fraction **exceeds 15%**. Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve. NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.
(The Particle Size Distribution Tests were undertaken in accordance with BS 1377: Part 2: 1990 Clause 9)

Appendix B.3 Geotechnical In-Situ and Laboratory Results

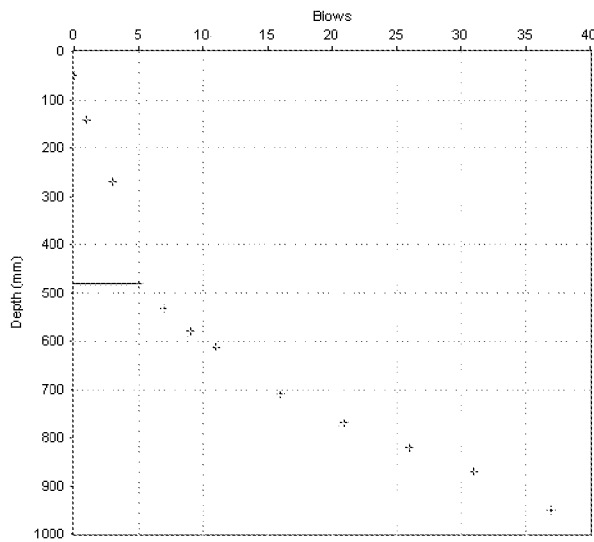
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

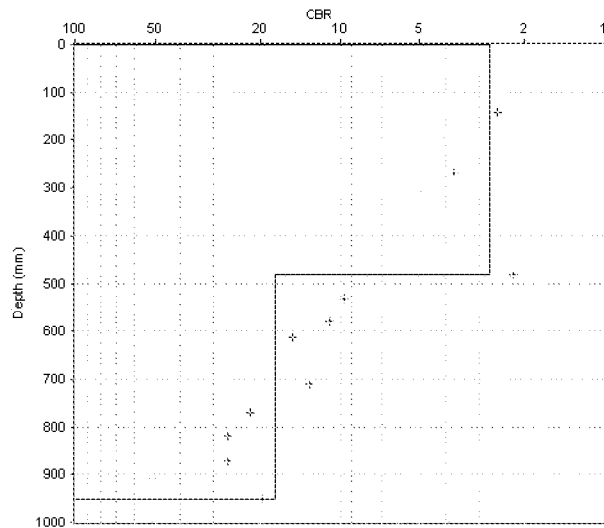
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 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 1.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	86.00	3	480	480
2	14.69	18	470	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

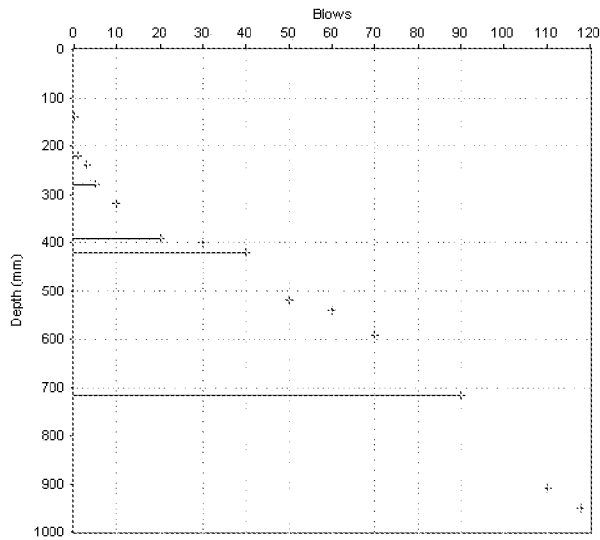
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

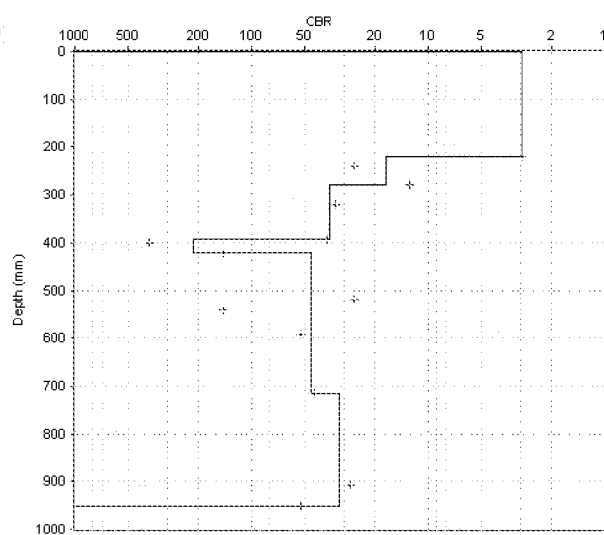
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 Cone Angle: 60 degrees
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Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 2.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	80.00	3	220	220
2	15.00	17	60	280
3	7.47	36	112	392
4	1.40	212	28	420
5	5.92	46	296	716
6	8.36	32	234	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

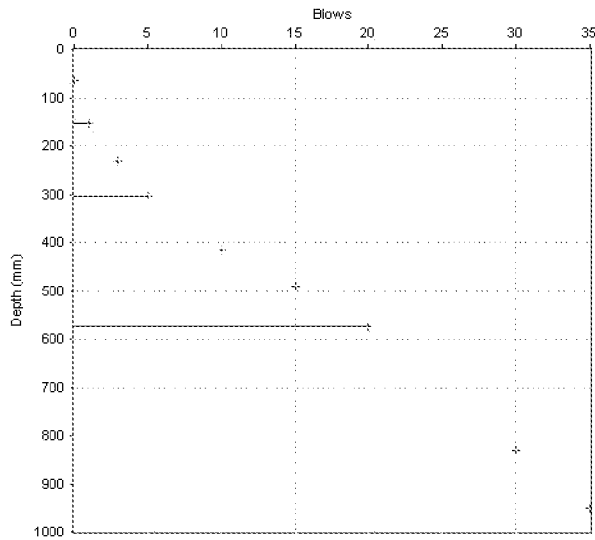
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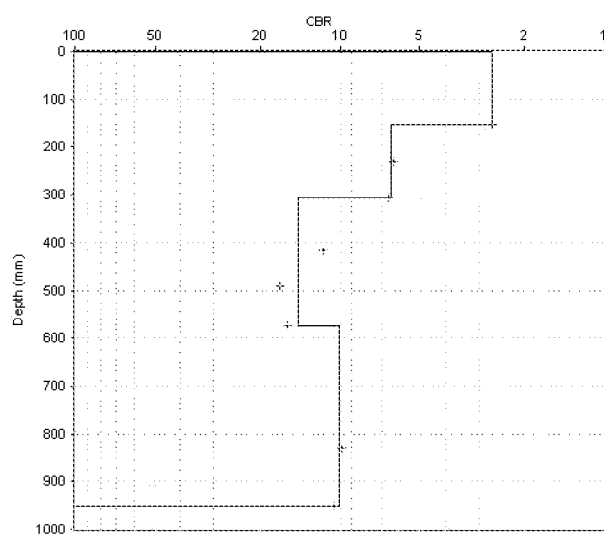
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 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 3.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	88.00	3	152	152
2	38.25	6	153	305
3	17.93	14	269	574
4	25.07	10	376	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

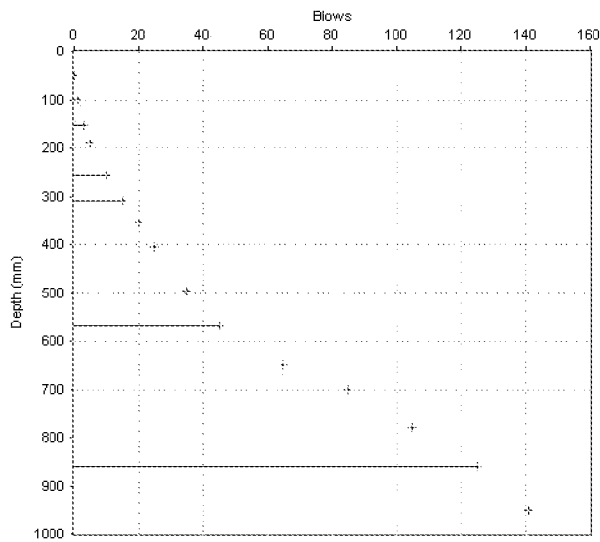
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

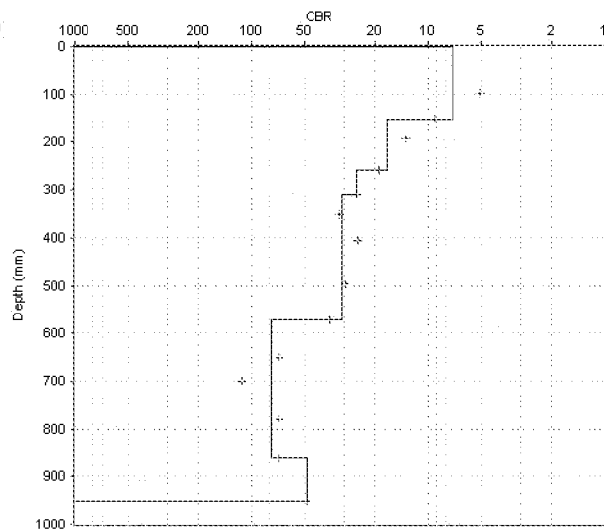
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 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 4.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	34.00	7	152	152
2	15.14	17	106	258
3	10.40	25	52	310
4	8.67	31	260	570
5	3.63	77	290	860
6	5.63	49	90	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

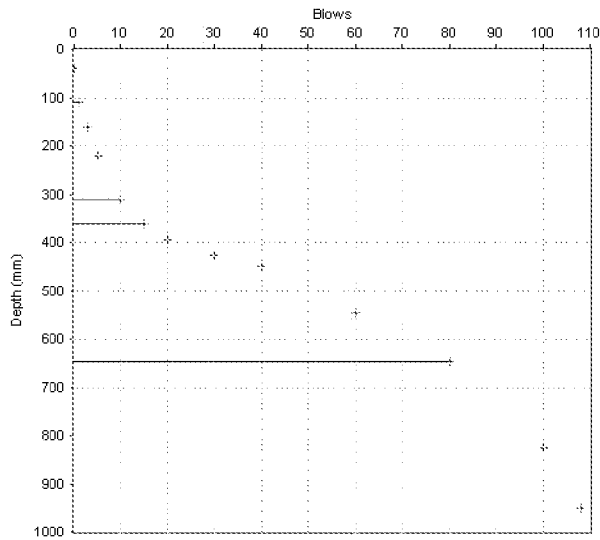
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

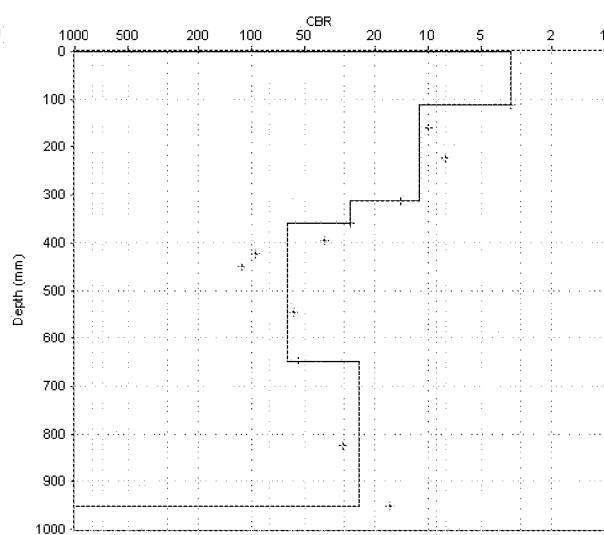
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 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 5.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	70.00	3	110	110
2	22.44	11	202	312
3	9.60	28	48	360
4	4.43	63	288	648
5	10.79	24	302	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

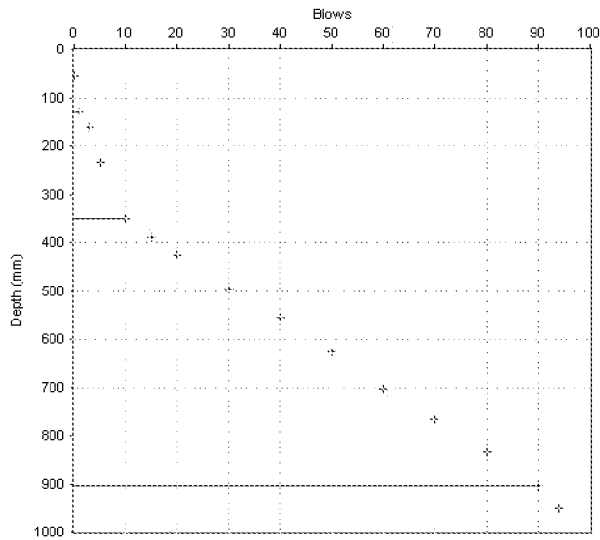
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

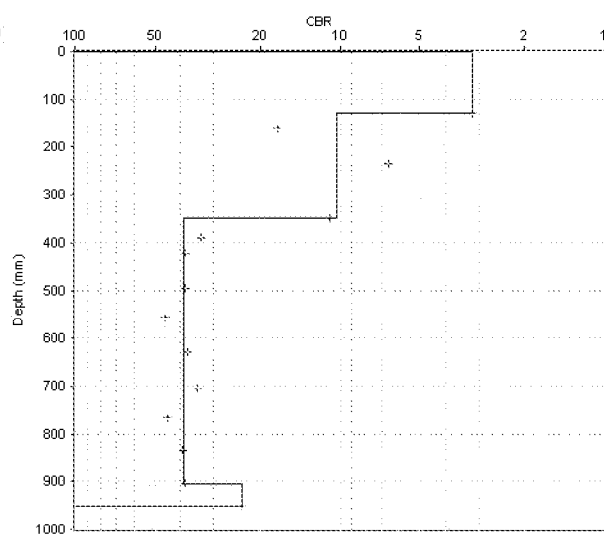
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 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 6.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	75.00	3	130	130
2	24.44	10	220	350
3	6.94	39	555	905
4	11.25	23	45	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

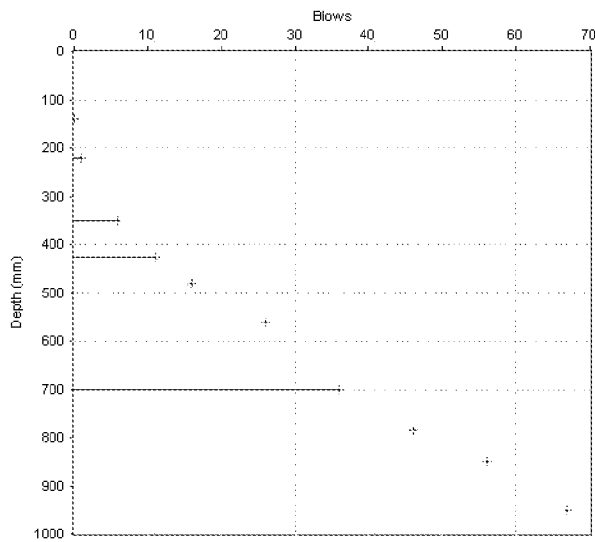
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

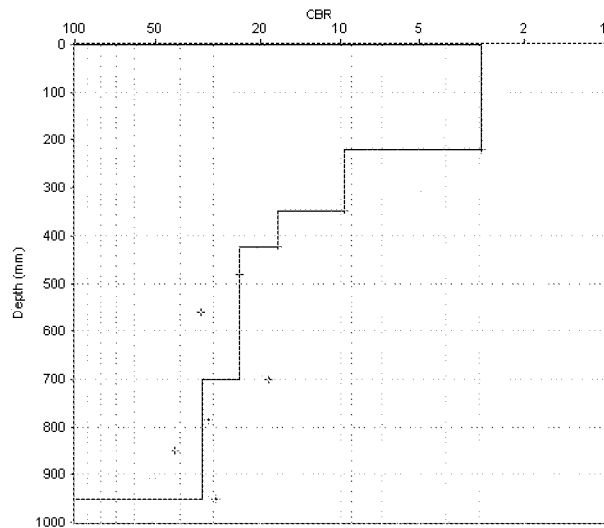
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 Cone Angle: 60 degrees
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Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 7.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	80.00	3	220	220
2	26.00	10	130	350
3	15.00	17	75	425
4	11.00	24	275	700
5	8.06	33	250	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

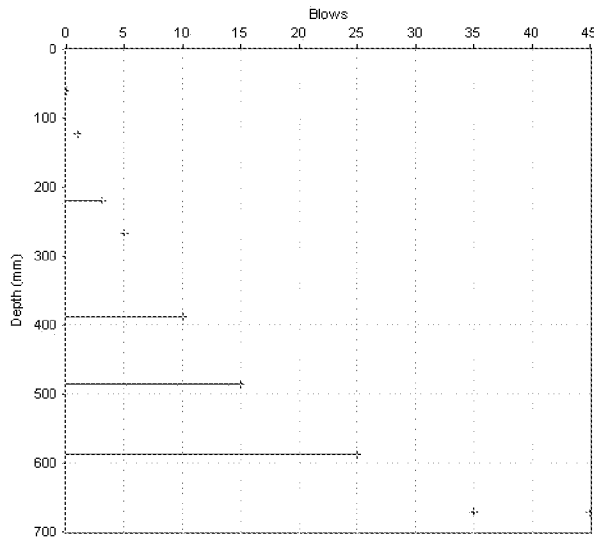
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

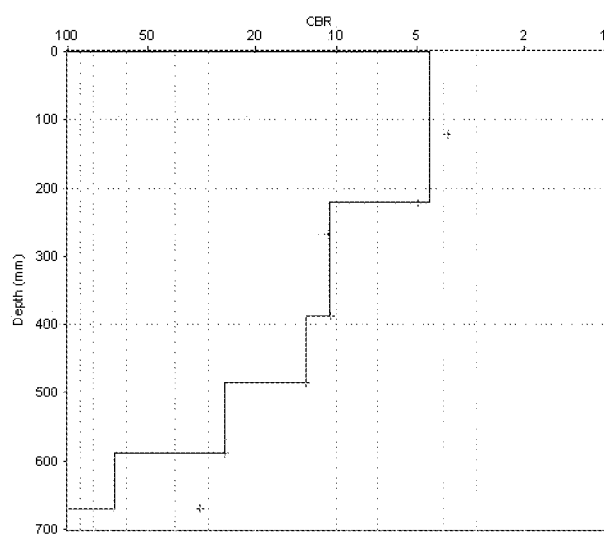
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 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 8.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	53.33	5	220	220
2	23.86	11	167	387
3	19.60	13	98	485
4	10.20	26	102	587
5	4.15	67	83	670

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

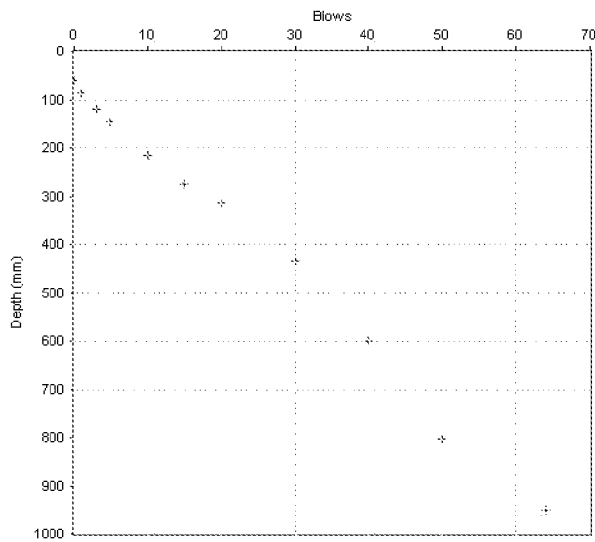
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

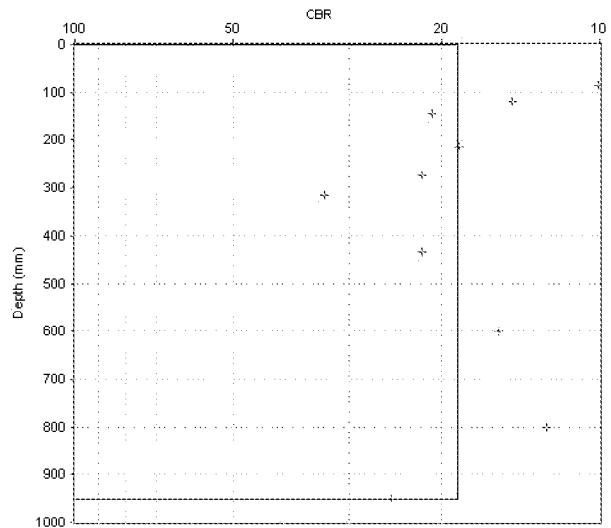
Chainage (km): 9.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 9.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	13.91	19	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

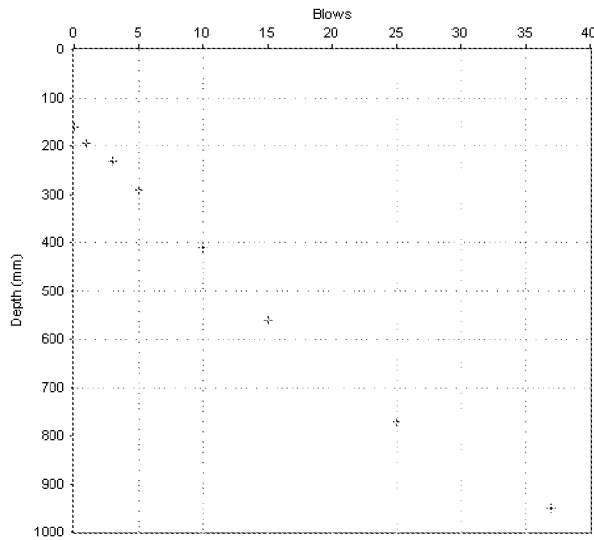
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

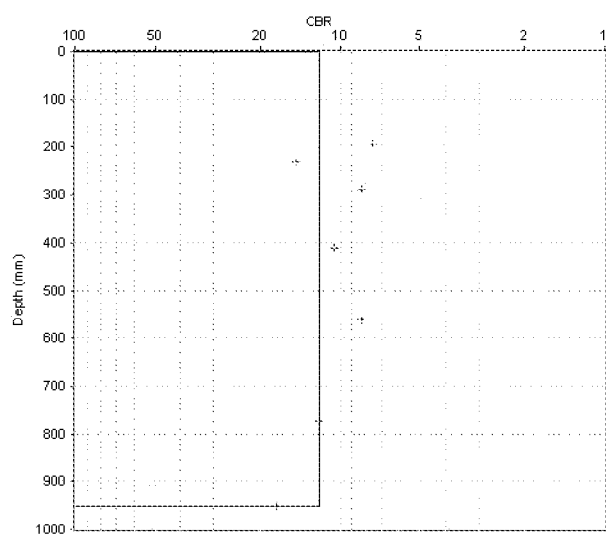
Chainage (km): 10.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 10.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	21.30	12	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

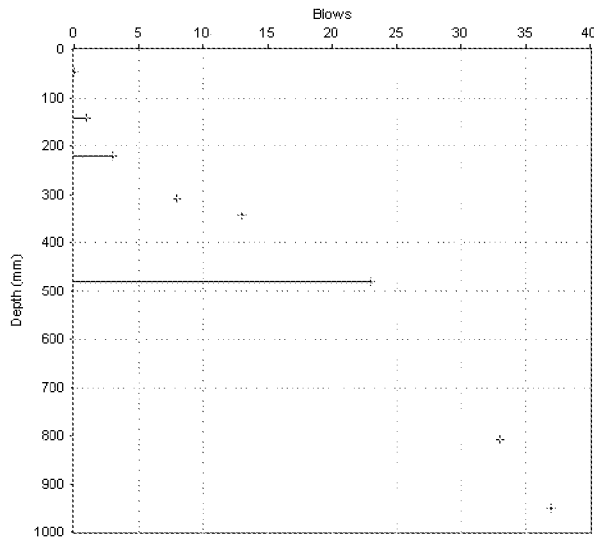
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

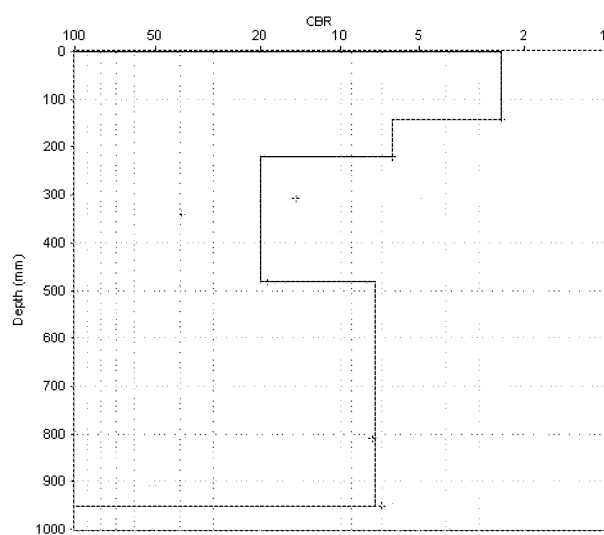
Chainage (km): 11.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 11.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	95.00	2	143	143
2	38.50	6	77	220
3	13.05	20	261	481
4	33.50	7	469	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

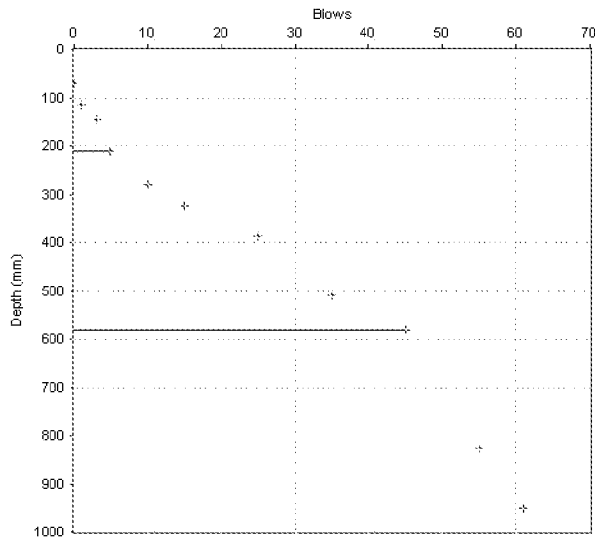
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

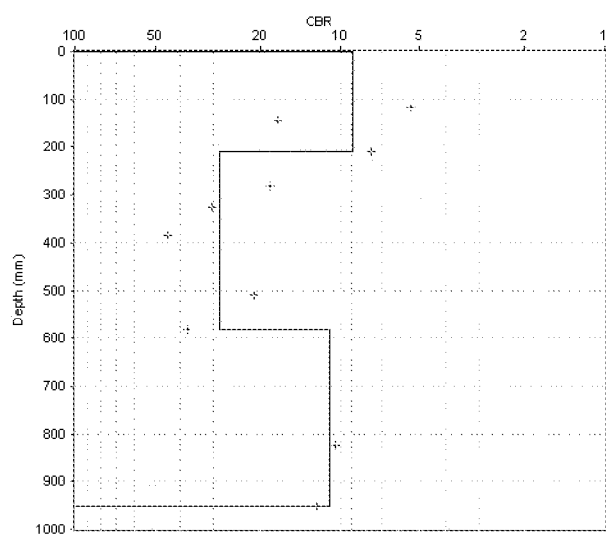
Chainage (km): 12.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 12.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	28.00	9	210	210
2	9.30	29	372	582
3	23.00	11	368	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

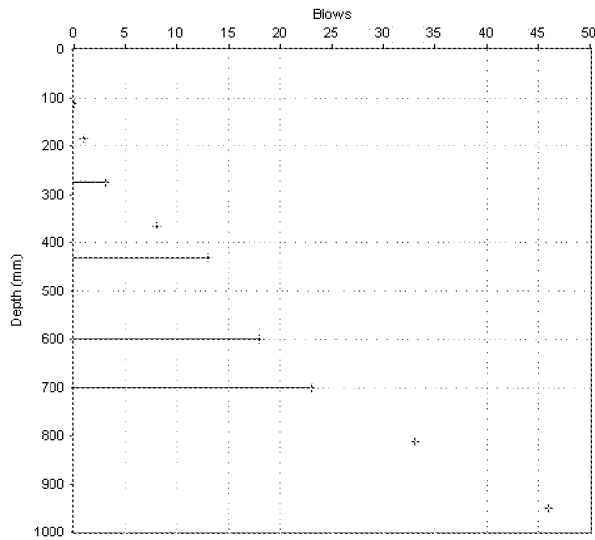
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

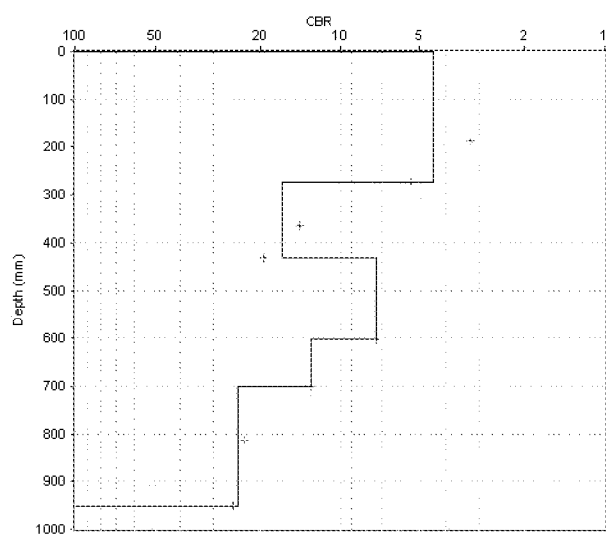
Chainage (km): 13.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 13.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	54.33	4	275	275
2	15.70	16	157	432
3	33.80	7	169	601
4	19.80	13	99	700
5	10.87	24	250	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

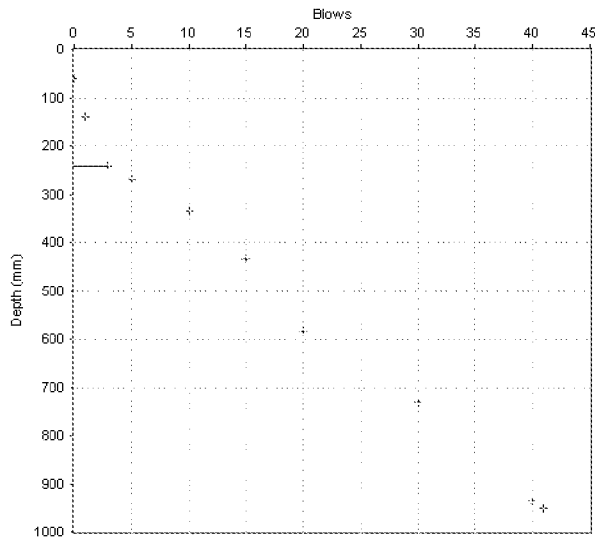
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

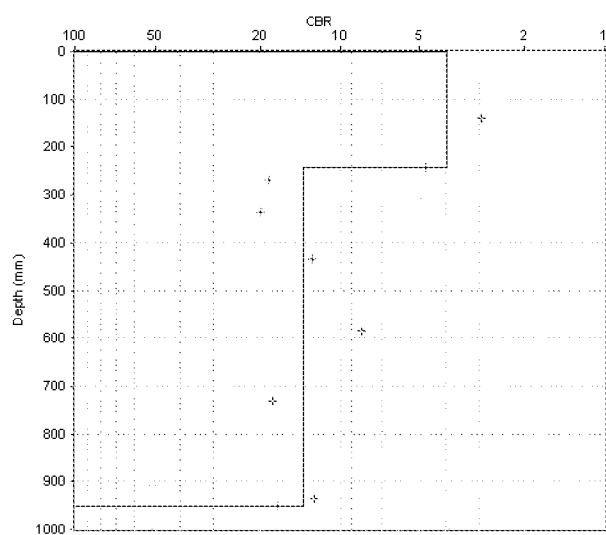
Chainage (km): 14.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 14.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	60.67	4	242	242
2	18.63	14	708	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

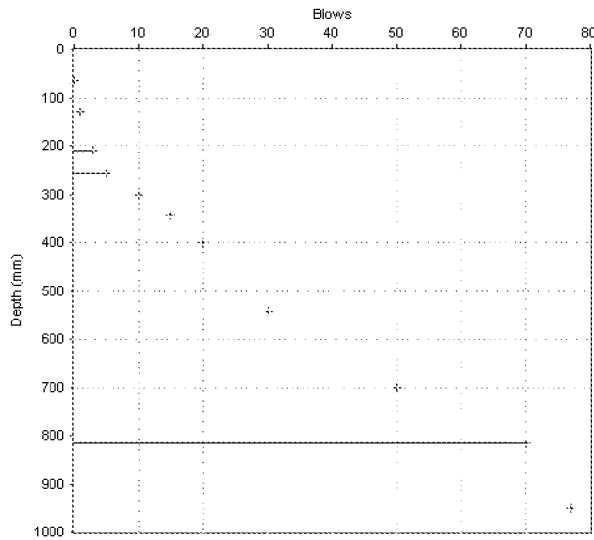
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

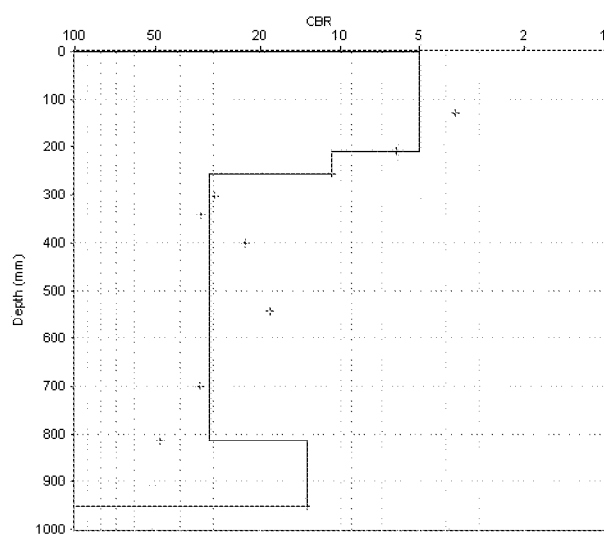
Chainage (km): 15.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 15.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	48.33	5	210	210
2	23.50	11	47	257
3	8.58	31	558	815
4	19.29	13	135	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

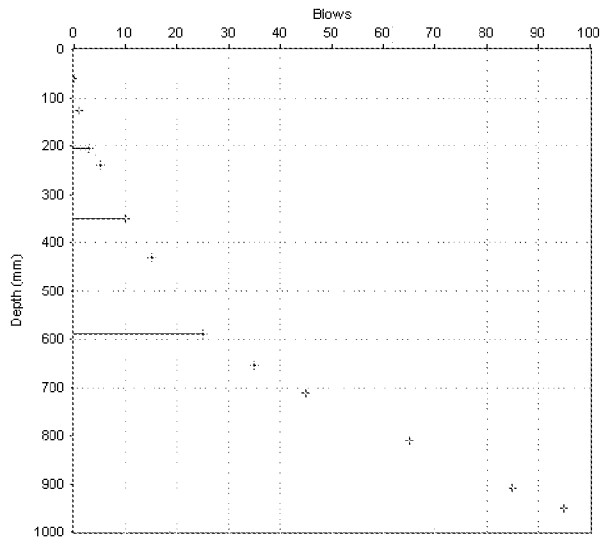
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

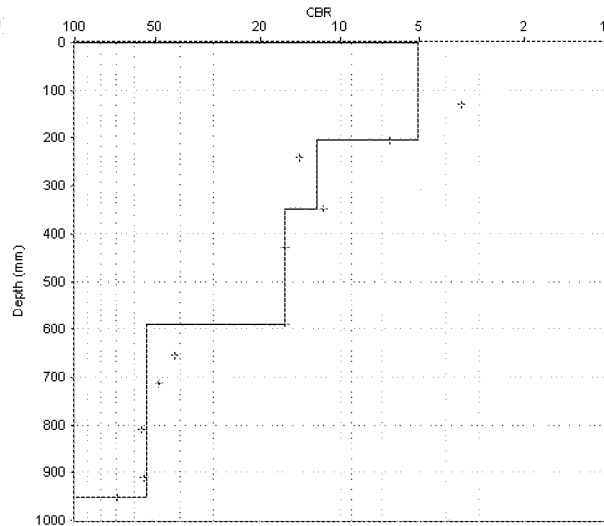
Chainage (km): 16.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 16.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	48.00	5	204	204
2	20.86	12	146	350
3	16.00	16	240	590
4	5.14	53	360	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

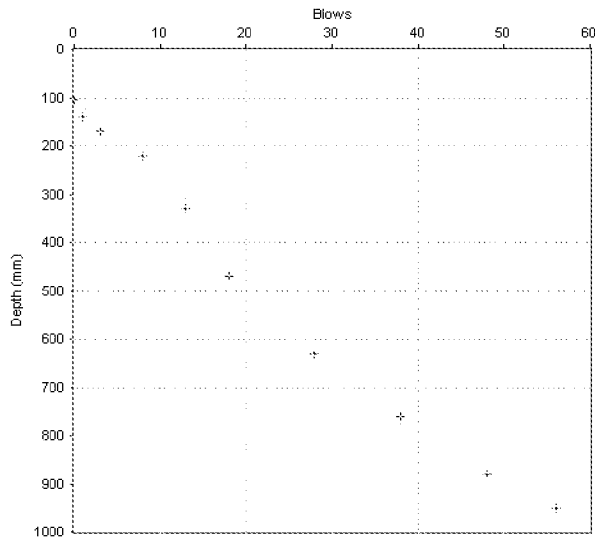
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

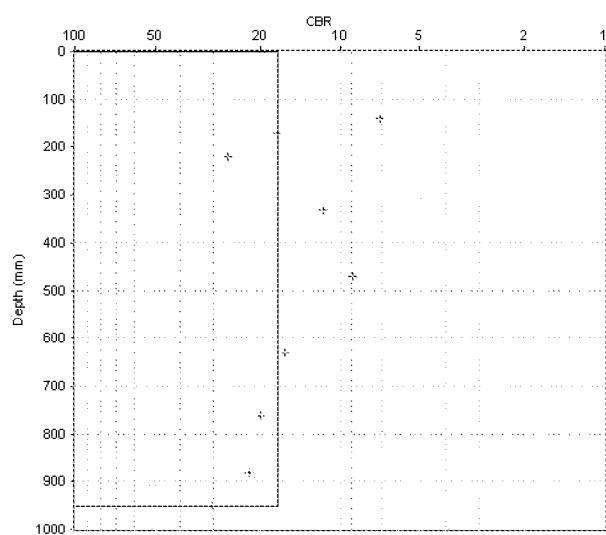
Chainage (km): 17.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 17.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	15.09	17	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

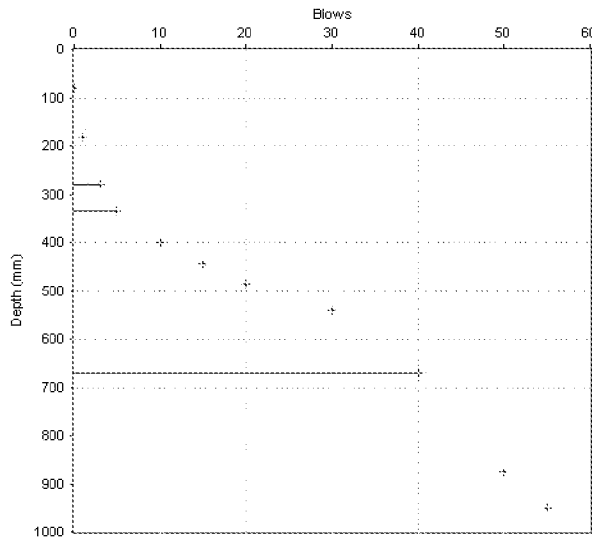
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

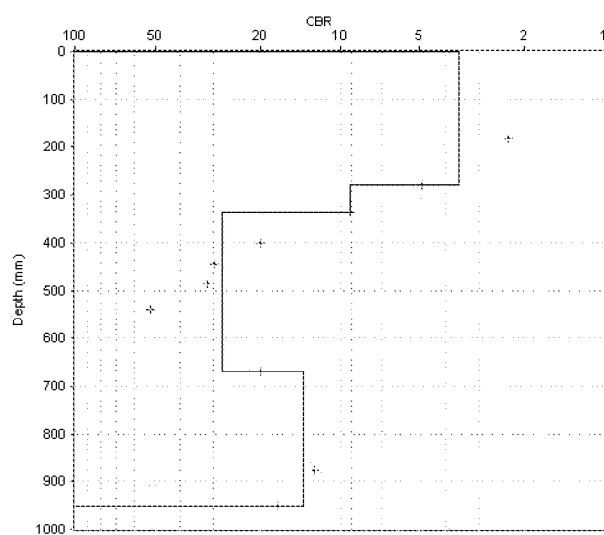
Chainage (km): 18.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 18.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	66.67	4	280	280
2	27.50	9	55	335
3	9.57	28	335	670
4	18.67	14	280	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

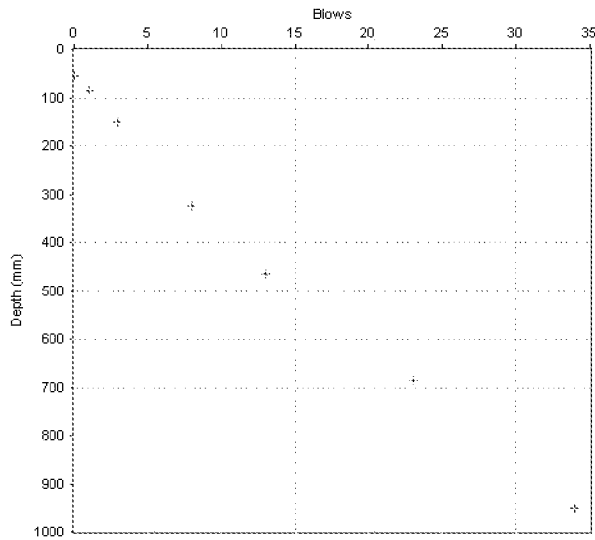
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

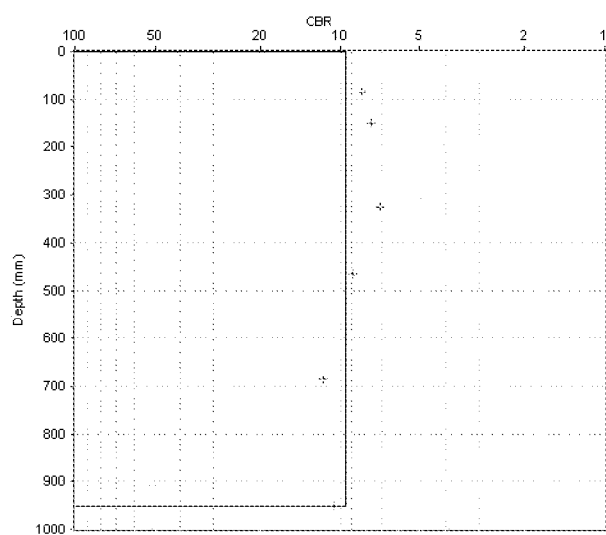
Chainage (km): 19.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 19.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	26.32	10	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

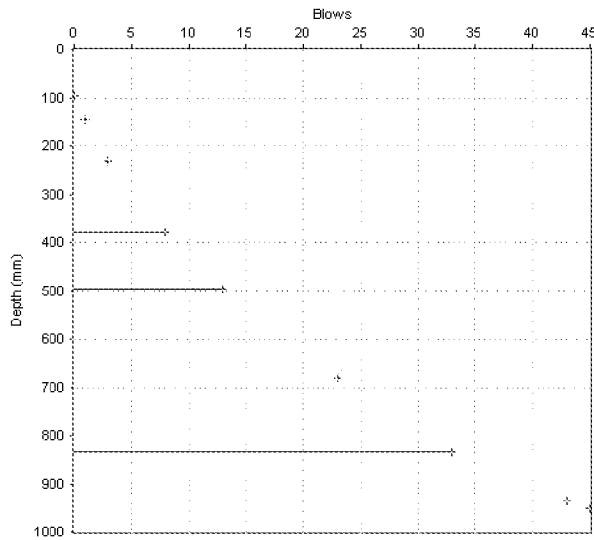
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

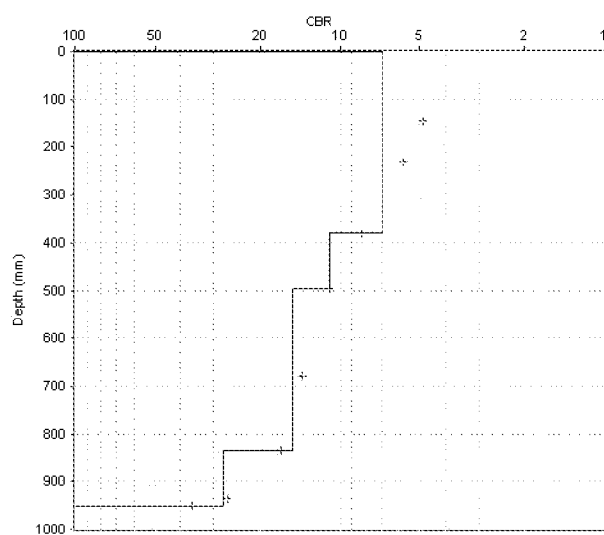
Chainage (km): 20.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 20.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.63	7	380	380
2	23.00	11	115	495
3	17.00	15	340	835
4	9.58	28	115	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

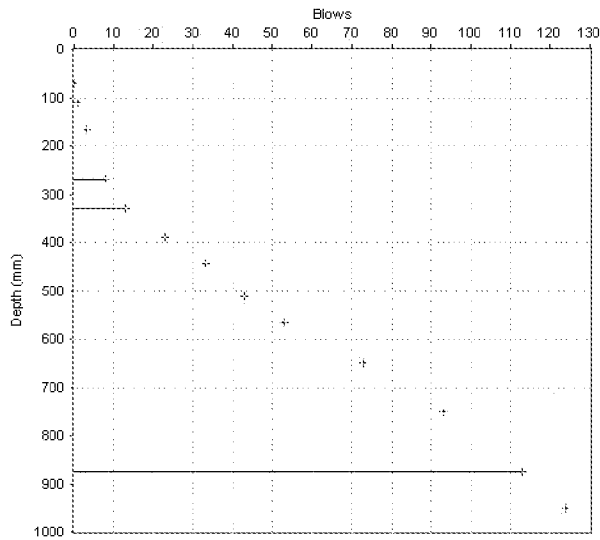
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

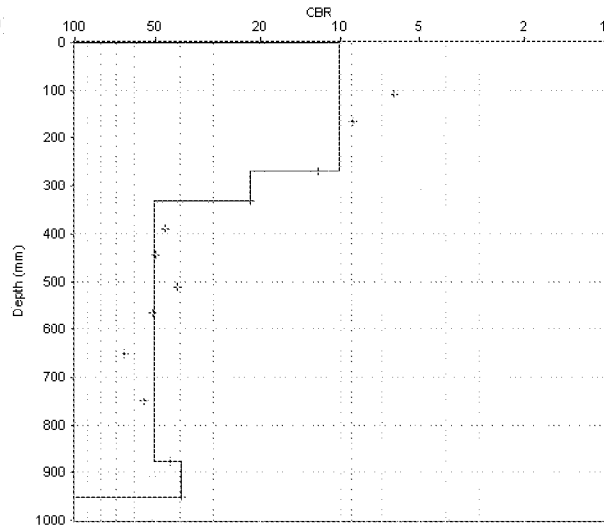
Chainage (km): 21.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 21.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	25.00	10	270	270
2	12.00	22	60	330
3	5.45	50	545	875
4	6.82	40	75	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

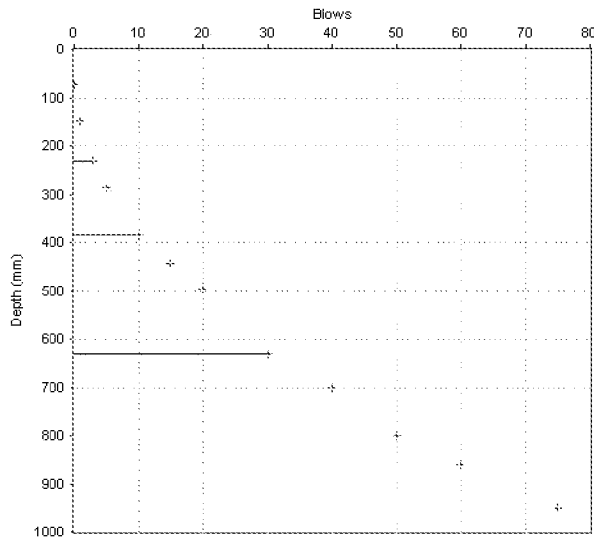
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

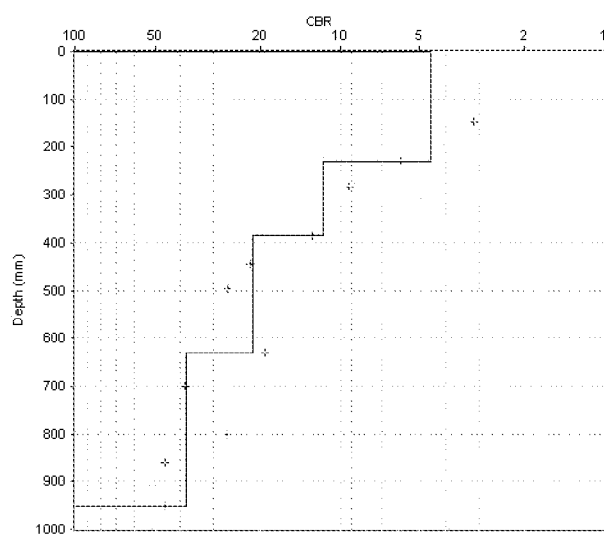
Chainage (km): 22.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 22.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	53.00	5	231	231
2	22.00	12	154	385
3	12.30	21	246	631
4	7.09	38	319	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

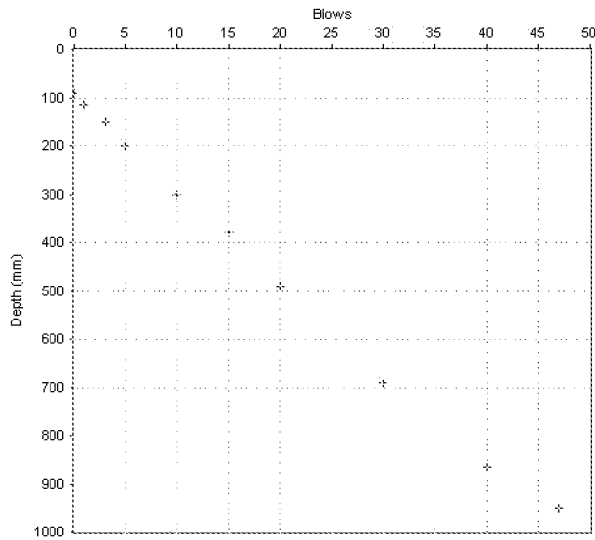
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

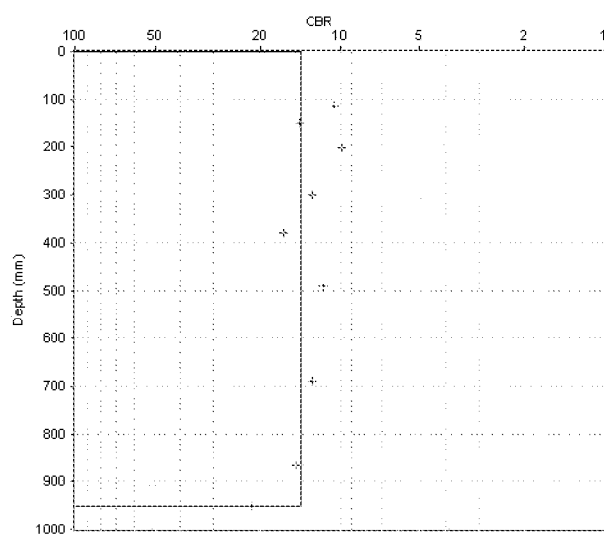
Chainage (km): 23.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 23.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	18.30	14	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

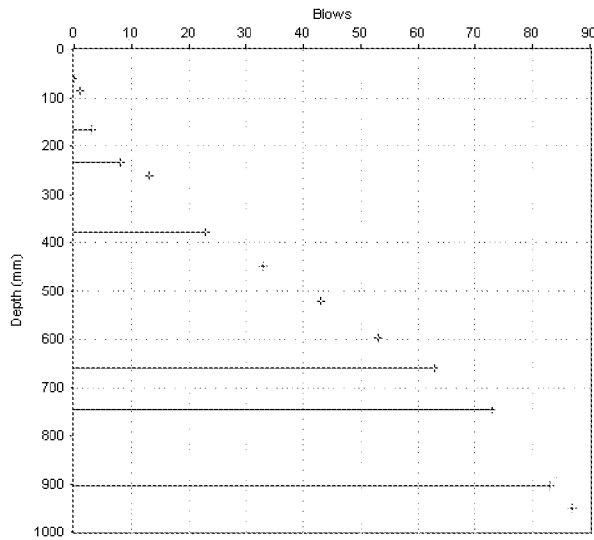
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

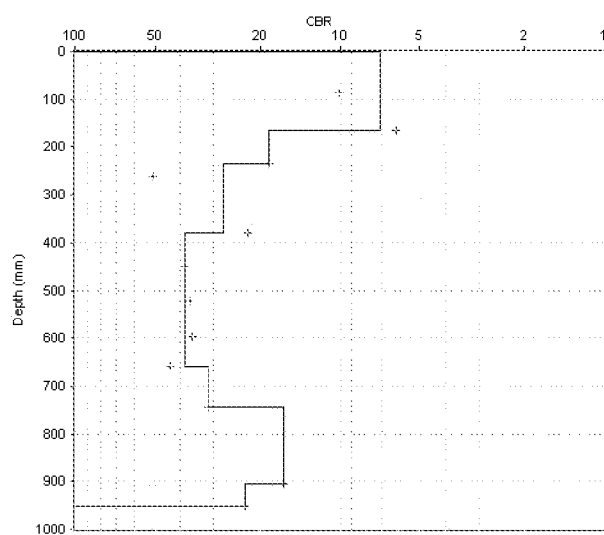
Chainage (km): 24.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 24.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	35.00	7	165	165
2	14.00	19	70	235
3	9.67	27	145	380
4	7.00	39	280	660
5	8.50	31	85	745
6	15.90	16	159	904
7	11.50	23	46	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

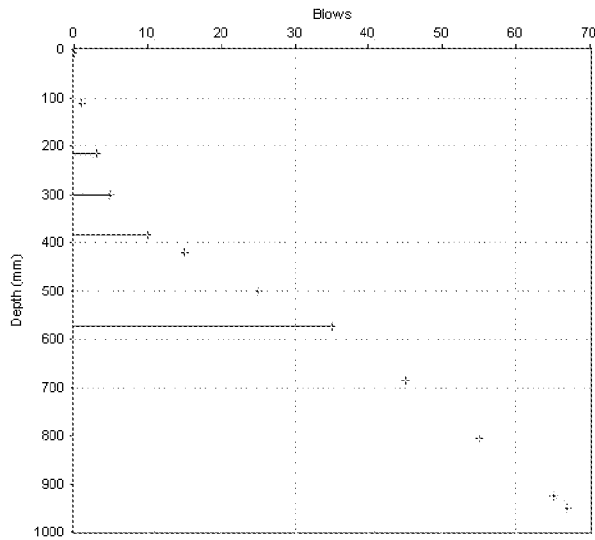
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

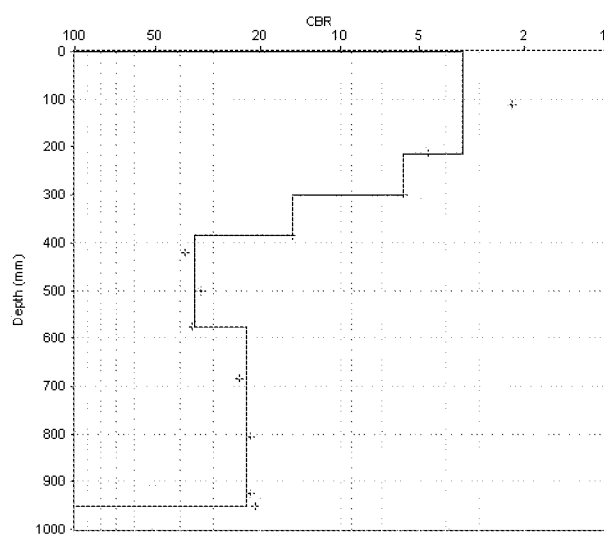
Chainage (km): 25.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 25.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	69.33	3	215	215
2	42.50	6	85	300
3	17.00	15	85	385
4	7.60	35	190	575
5	11.72	22	375	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

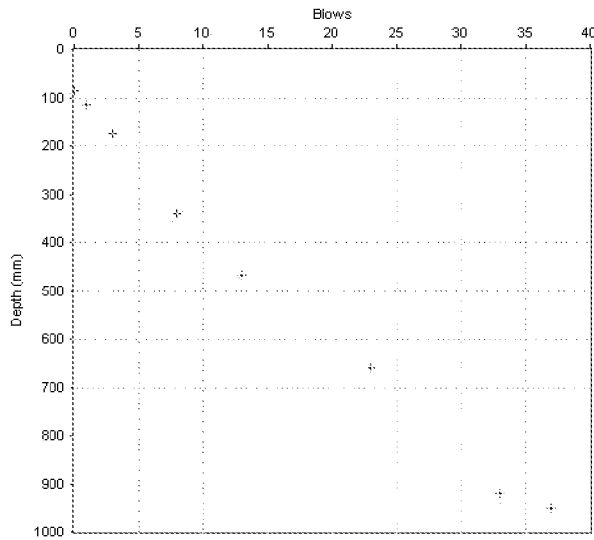
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

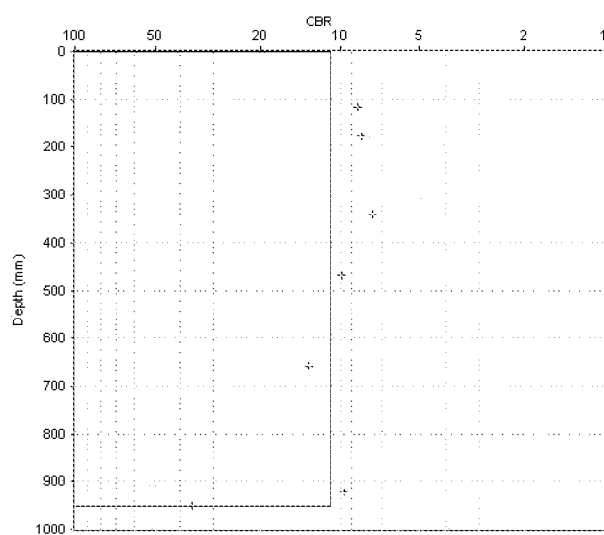
Chainage (km): 26.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 26.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	23.35	11	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

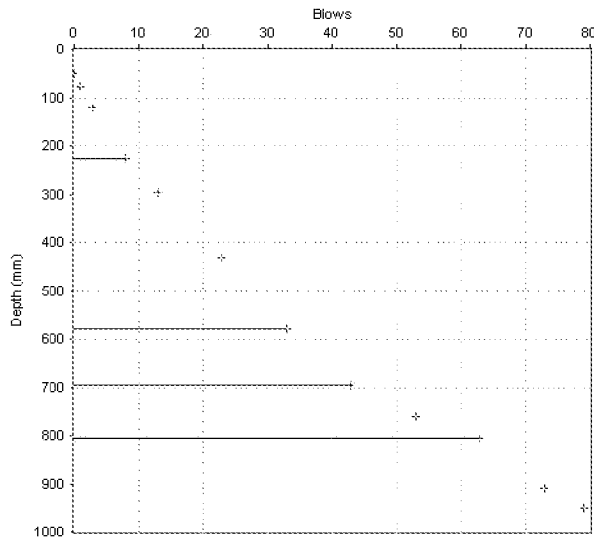
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

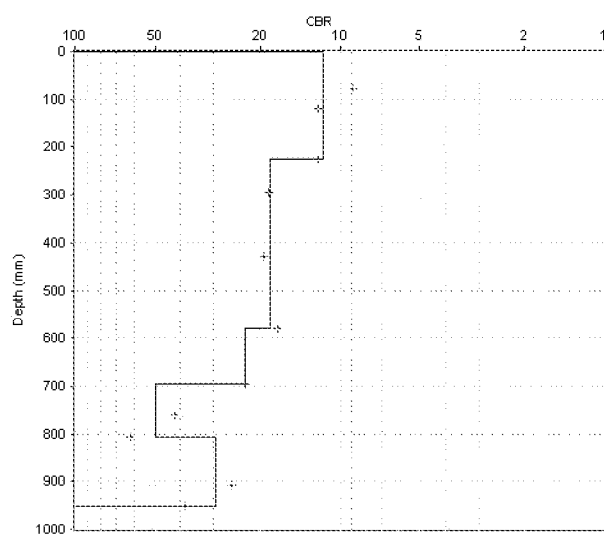
Chainage (km): 27.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 27.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	21.88	12	225	225
2	14.20	18	355	580
3	11.50	23	115	695
4	5.50	50	110	805
5	9.06	29	145	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

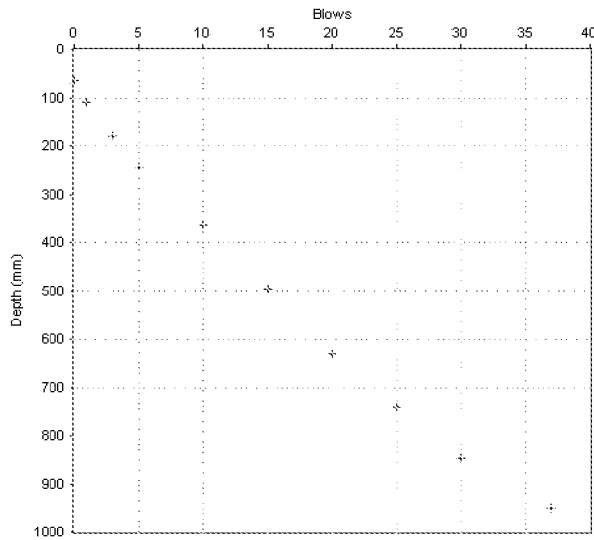
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

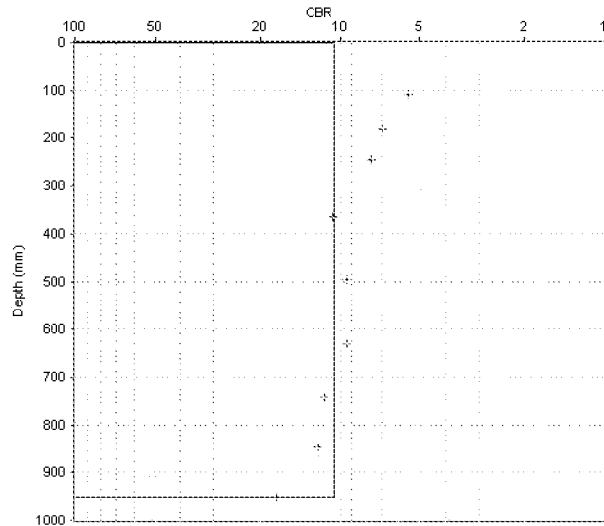
Chainage (km): 28.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 28.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	23.92	11	950	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

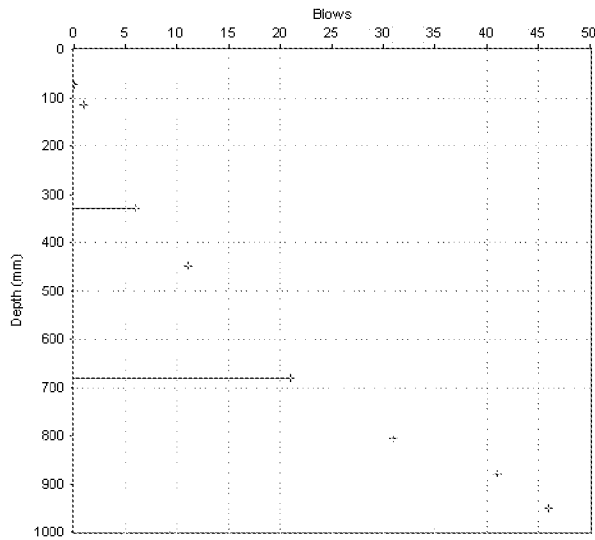
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

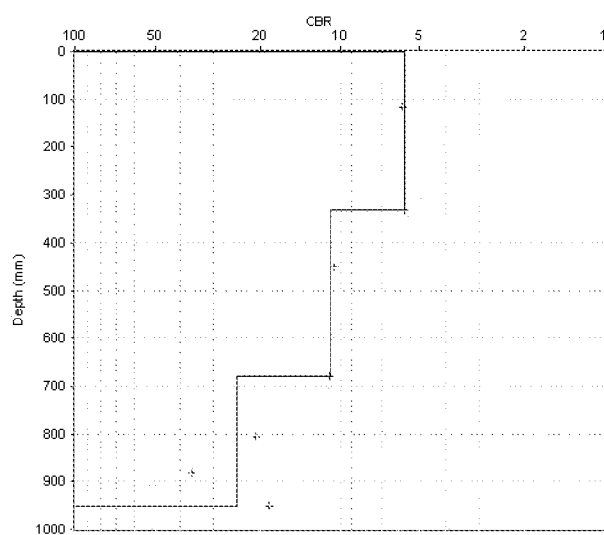
Chainage (km): 29.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 29.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	42.83	6	330	330
2	23.33	11	350	680
3	10.80	24	270	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

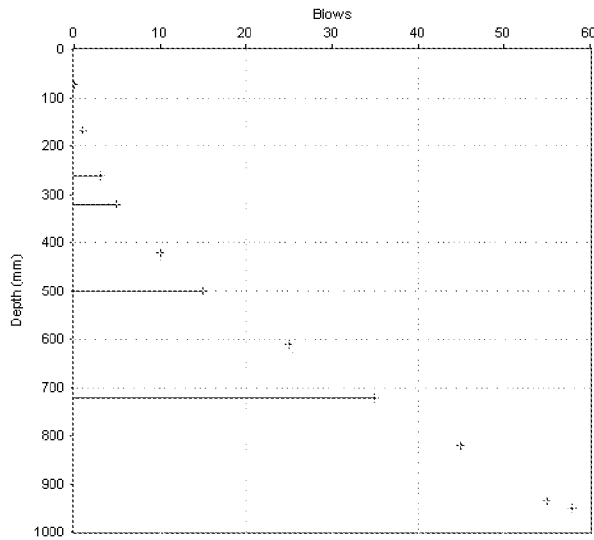
DCP Layer Strength Analysis Report

Project Name: 19522 DCPs

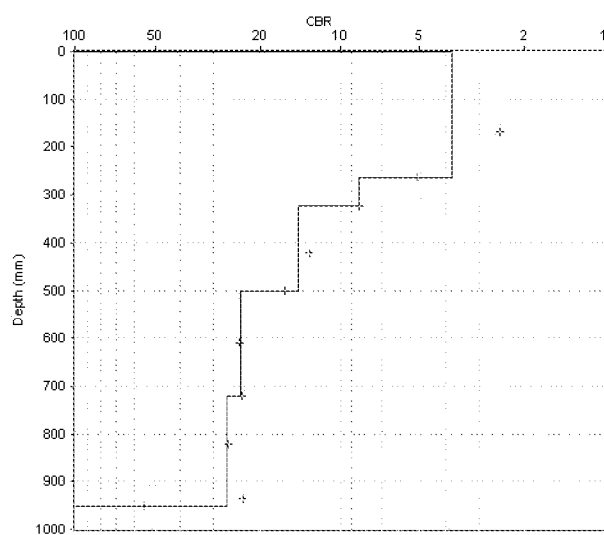
Chainage (km): 30.000
 Direction:
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 0
 Test Date: 03/09/2021

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 30.000



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	63.00	4	263	263
2	29.50	8	59	322
3	17.80	14	178	500
4	11.10	24	222	722
5	9.91	27	228	950

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by



Laboratory Report



Contract Number: 55233

Client Ref: **19522/SB**

Report Date: **17-08-2021**

Client PO: **19522**

Client **Soils Limited**
Newton House
Cross Road
Tadworth
Surrey
KT20 5SR

Contract Title: **Westergate**
For the attention of: **Sam Bevins**

Date Received: **04-08-2021**

Date Completed: **17-08-2021**

Test Description	Qty
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	24
1 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.4 & 5.3 - * UKAS	24
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	13
Samples Received - @ Non Accredited Test	37
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)

Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN



**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.4 & 5.3)**

Contract Number	55233	
Site Name	Westergate	
Date Tested	16/08/2021	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS01		D	1.10	-		Brown sandy silty CLAY
WS02		D	1.00	-		Brown silty CLAY
WS02		D	2.00	-		Brown gravelly sandy silty CLAY
WS03		D	1.00	-		Brown gravelly sandy silty CLAY
WS04		D	1.00	-		Brown sandy silty CLAY
WS06		D	1.10	-		Brown sandy silty CLAY
WS07		D	1.50	-		Brown gravelly sandy silty CLAY
WS08		D	1.50	-		Brown sandy silty CLAY
WS09		D	0.50	-		Brown sandy silty CLAY
WS10		D	1.70	-		Brown gravelly silty CLAY
WS11		D	1.60	-		Brown silty CLAY
WS12		D	2.10	-		Brown silty CLAY
WS13		D	2.10	-		Brown silty CLAY
WS14		D	1.50	-		Brown silty CLAY
WS15		D	1.20	-		Brown silty CLAY
WS16		D	1.80	-		Brown silty CLAY
WS18		D	1.20	-		Brown silty CLAY
WS19		D	2.20	-		Brown silty CLAY
WS21		D	2.00	-		Brown sandy silty CLAY
WS22		D	1.20	-		Brown gravelly sandy silty CLAY
WS23		D	1.20	-		Brown silty CLAY
WS24		D	1.60	-		Brown silty CLAY
WS25		D	1.50	-		Brown gravelly sandy silty CLAY
WS26		D	1.20	-		Brown gravelly sandy silty CLAY

Operators	Checked	17/08/2021	Richard John (Advanced Testing Manager)
Clayton Jenkins	Approved	17/08/2021	Paul Evans (Quality/Technical Manager)



NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.4 & 5.3)

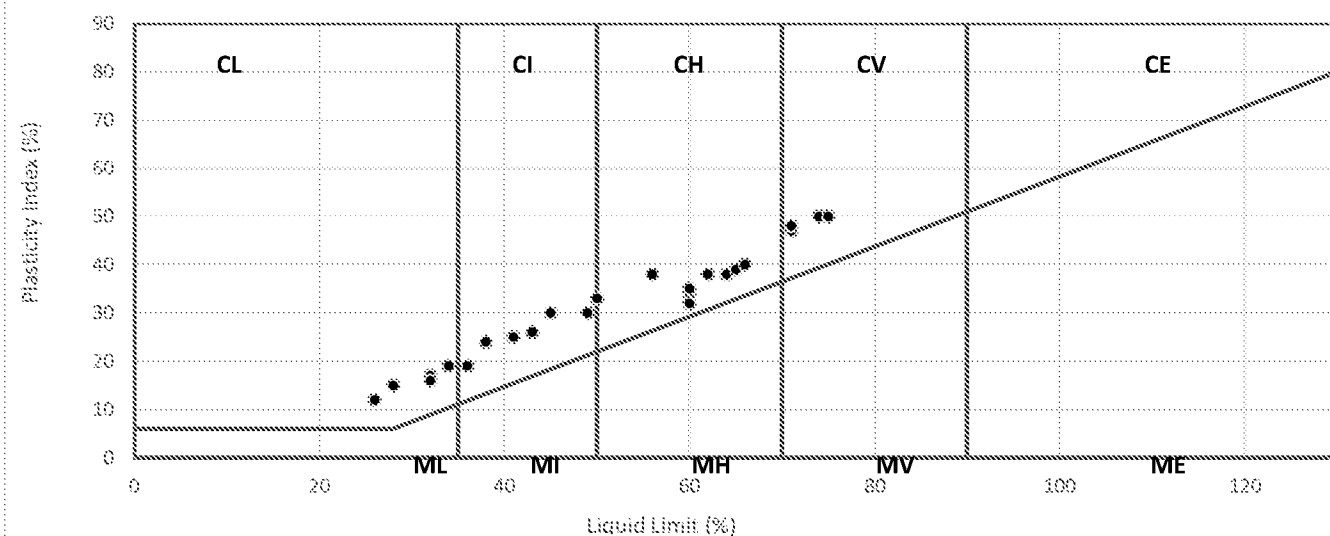
Contract Number	55233	
Project Location	Westergate	
Date Tested	16/08/2021	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WS01		D	1.10	-		16	45	15	30	100	CI Intermediate Plasticity
WS02		D	1.00	-		17	43	17	26	100	CI Intermediate Plasticity
WS02		D	2.00	-		18	34	15	19	87	CL Low Plasticity
WS03		D	1.00	-		17	32	15	17	90	CL Low Plasticity
WS04		D	1.00	-		16	49	19	30	100	CI Intermediate Plasticity
WS06		D	1.10	-		24	56	18	38	100	CH High Plasticity
WS07		D	1.50	-		14	38	14	24	89	CI Intermediate Plasticity
WS08		D	1.50	-		20	50	17	33	100	CI/H Inter/High Plasticity
WS09		D	0.50	-		12	41	16	25	100	CI Intermediate Plasticity
WS10		D	1.70	-		19	36	17	19	92	CI Intermediate Plasticity
WS11		D	1.60	-		33	60	26	34	100	CH High Plasticity
WS12		D	2.10	-		25	62	24	38	100	CH High Plasticity
WS13		D	2.10	-		33	60	25	35	100	CH High Plasticity
WS14		D	1.50	-		29	64	26	38	100	CH High Plasticity
WS15		D	1.20	-		31	71	24	47	100	CV Very High Plasticity
WS16		D	1.80	-		31	74	24	50	100	CV Very High Plasticity
WS18		D	1.20	-		29	71	23	48	100	CV Very High Plasticity
WS19		D	2.20	-		31	75	25	50	100	CV Very High Plasticity
WS21		D	2.00	-		32	65	26	39	100	CH High Plasticity
WS22		D	1.20	-		17	26	14	12	54	CL Low Plasticity
WS23		D	1.20	-		31	60	28	32	100	CH High Plasticity
WS24		D	1.60	-		33	66	26	40	100	CH High Plasticity
WS25		D	1.50	-		15	28	13	15	39	CL Low Plasticity
WS26		D	1.20	-		18	32	16	16	91	CL Low Plasticity

Symbols: NP : Non Plastic

: Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



Operators	Checked	17/08/2021	Richard John (Advanced Testing Manager)
Clayton Jenkins	Approved	17/08/2021	Paul Evans (Quality/Technical Manager)





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS01

Site Name Westergate

Sample No.

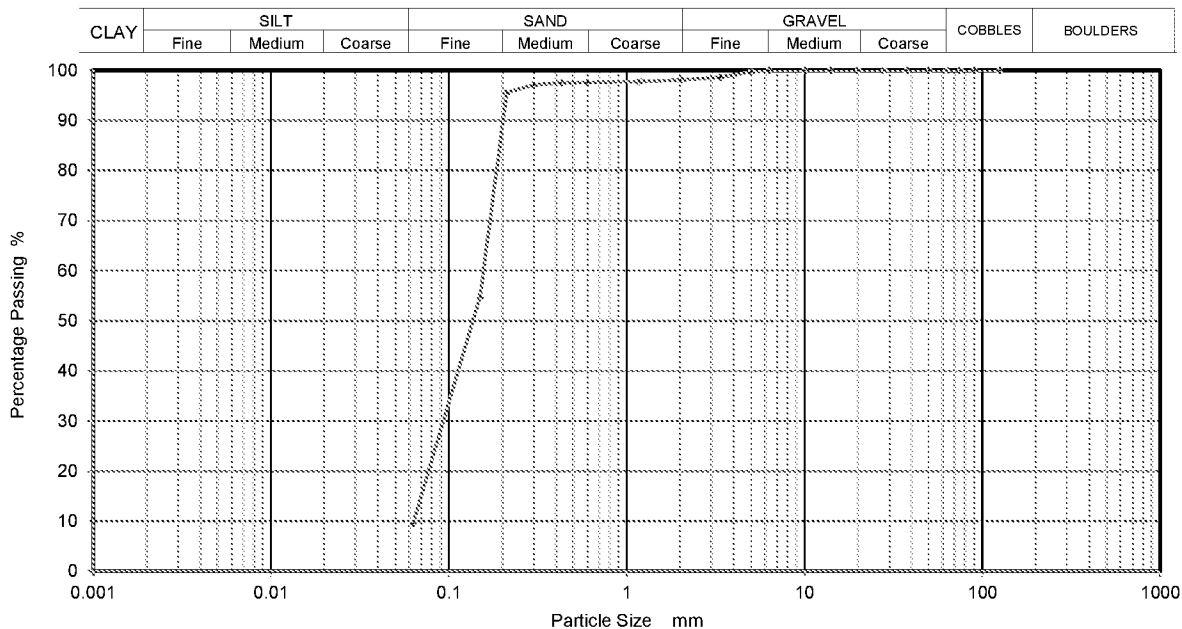
Soil Description Brown slightly fine gravelly clayey/silty fine to coarse SAND

Depth Top 2.00

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	98		
1.18	98		
0.6	98		
0.425	98		
0.3	97		
0.212	96		
0.15	55		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	88
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS04

Site Name Westergate

Sample No.

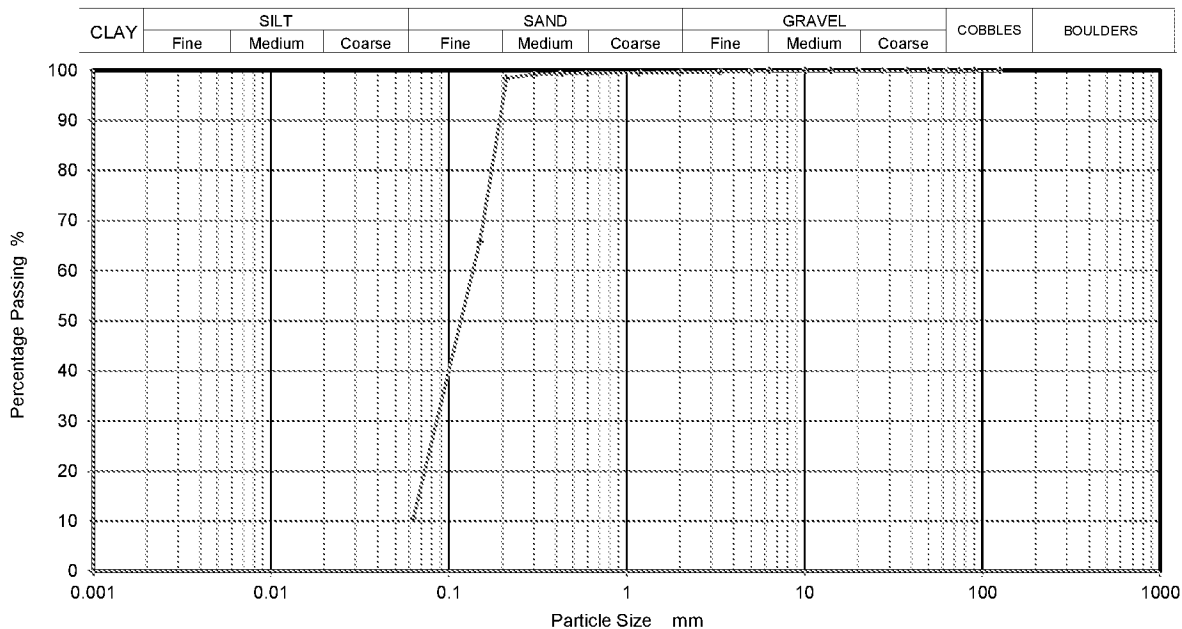
Soil Description Brown clayey/silty fine to coarse SAND

Depth Top 1.90

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	99		
0.3	99		
0.212	99		
0.15	66		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	90
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS05

Site Name Westergate

Sample No.

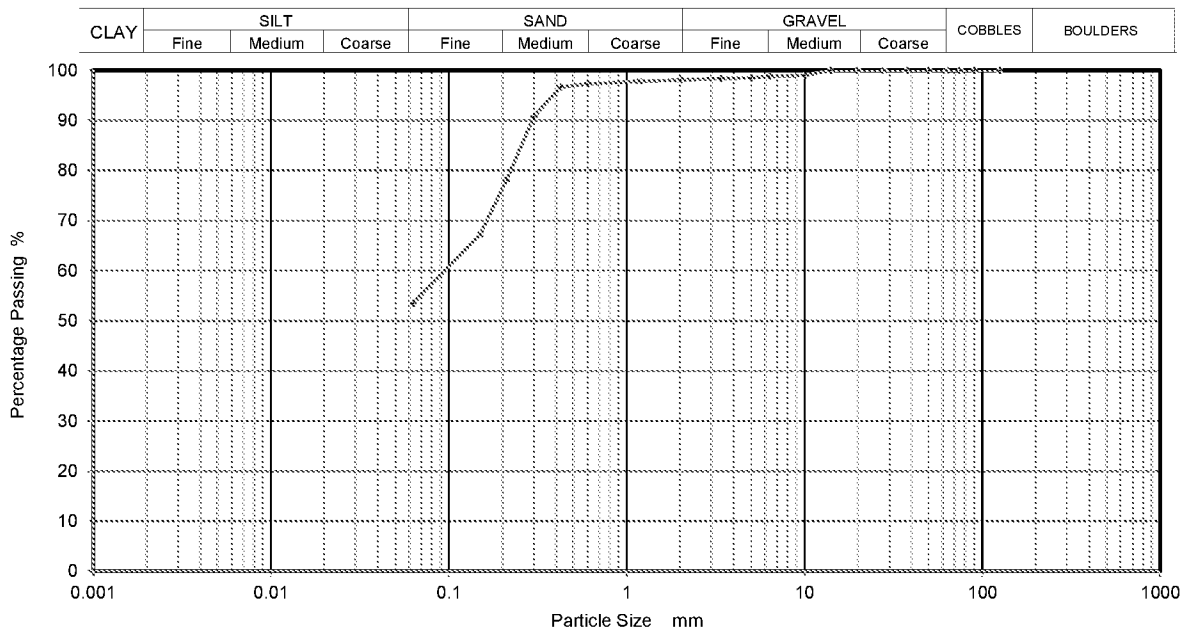
Soil Description Brown slightly fine to medium gravelly fine to coarse sandy
SILT/CLAY

Depth Top 1.60

Depth Base

Date Tested 12/08/2021

Sample Type D



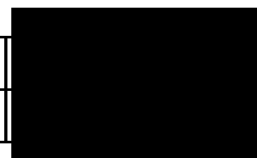
Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	98		
0.6	97		
0.425	97		
0.3	91		
0.212	78		
0.15	67		
0.063	53		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	45
Silt and Clay	53

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS09

Site Name Westergate

Sample No.

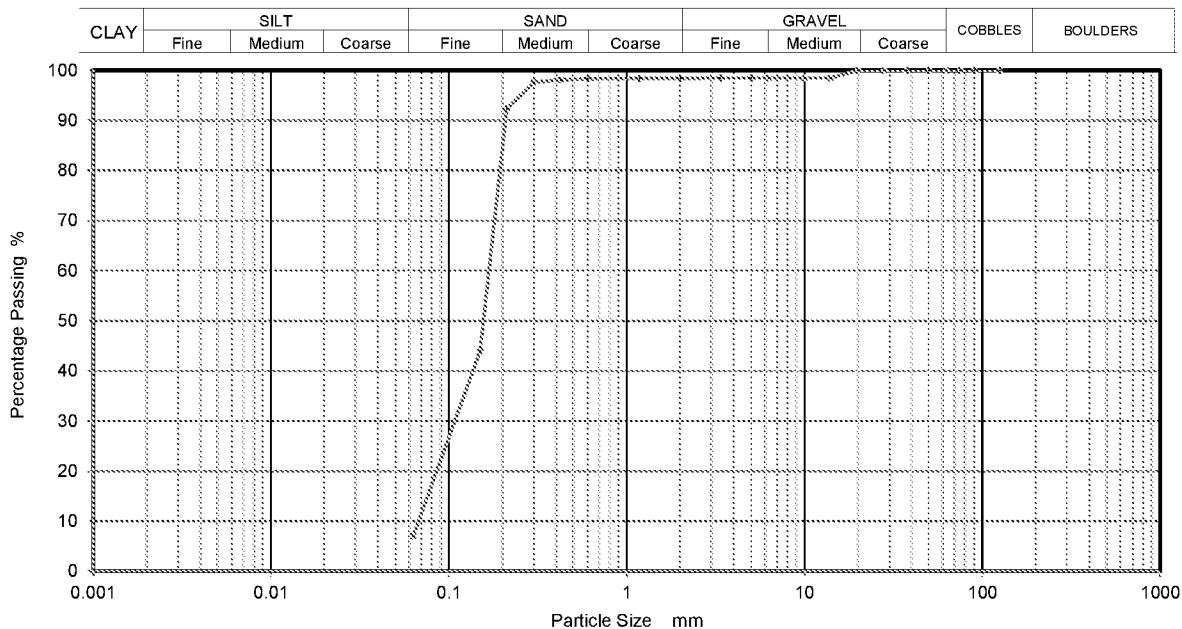
Soil Description Brown slightly fine to medium gravelly slightly clayey/silty fine to coarse SAND

Depth Top 1.50

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	98		
6.3	98		
5	98		
3.35	98		
2	98		
1.18	98		
0.6	98		
0.425	98		
0.3	98		
0.212	92		
0.15	44		
0.063	7		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	91
Silt and Clay	7

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS12

Site Name Westergate

Sample No.

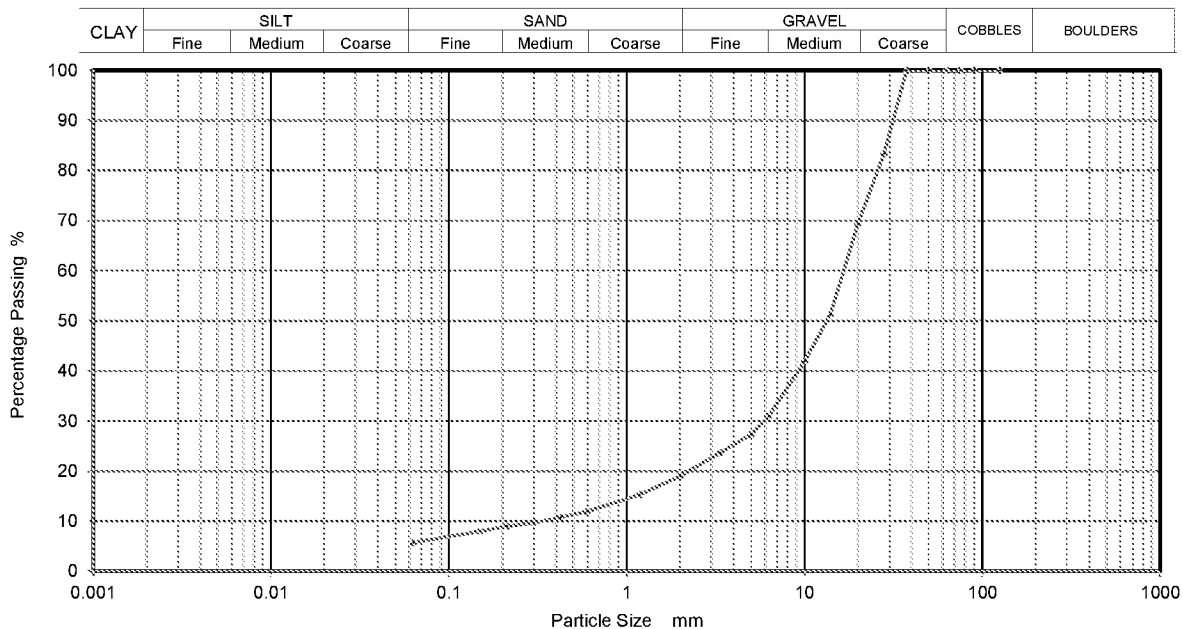
Soil Description Off white slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL

Depth Top 1.60

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	83		
20	69		
14	51		
10	42		
6.3	31		
5	27		
3.35	24		
2	19		
1.18	15		
0.6	12		
0.425	11		
0.3	10		
0.212	9		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	13
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS13

Site Name Westergate

Sample No.

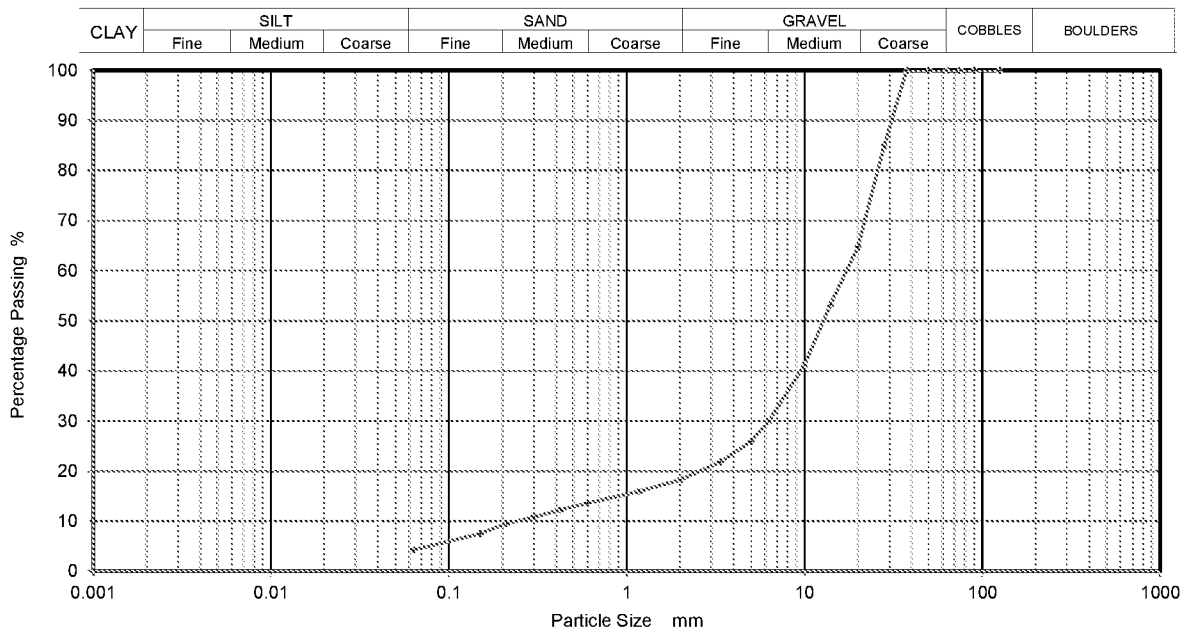
Soil Description Grey slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL

Depth Top 1.10

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	85		
20	65		
14	53		
10	41		
6.3	30		
5	26		
3.35	22		
2	18		
1.18	16		
0.6	14		
0.425	12		
0.3	11		
0.212	10		
0.15	8		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	82
Sand	14
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS19

Site Name Westergate

Sample No.

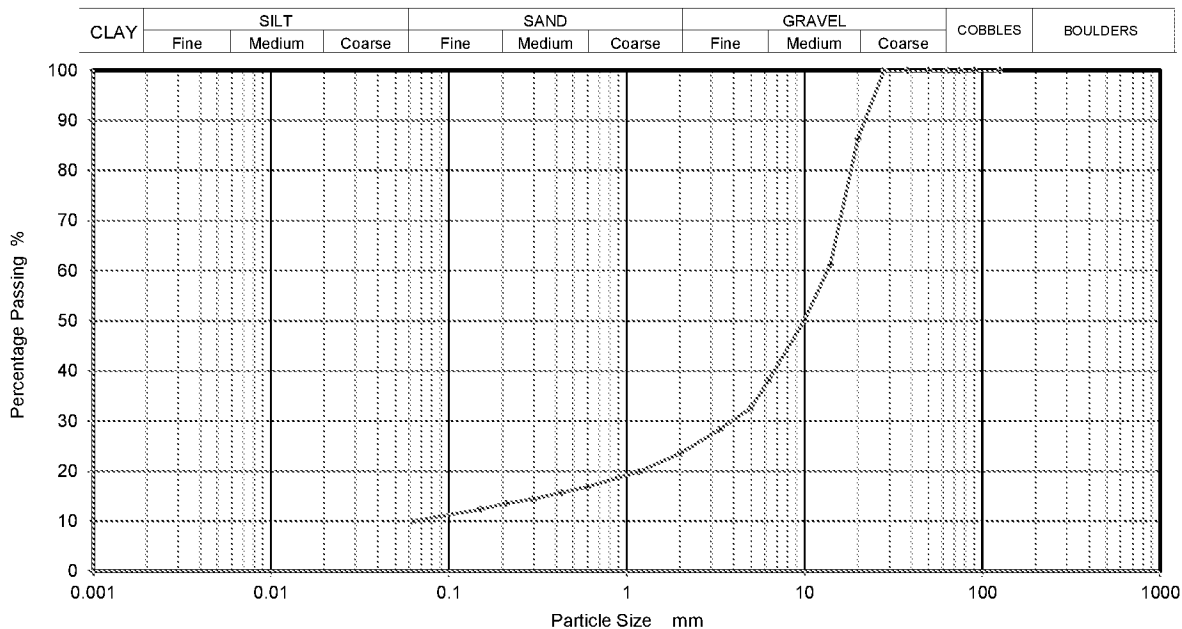
Soil Description Off white clayey/silty fine to coarse sandy fine to coarse GRAVEL

Depth Top 1.20

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	86		
14	61		
10	50		
6.3	38		
5	33		
3.35	28		
2	24		
1.18	20		
0.6	17		
0.425	16		
0.3	14		
0.212	14		
0.15	12		
0.063	10		

Sample Proportions	% dry mass
Cobbles	0
Gravel	76
Sand	14
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John	
David	Approved	17/08/2021	Paul Evans	





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS20

Site Name Westergate

Sample No.

Soil Description

Brown slightly fine to medium gravelly clayey/silty fine to coarse
SAND

Depth Top

1.20

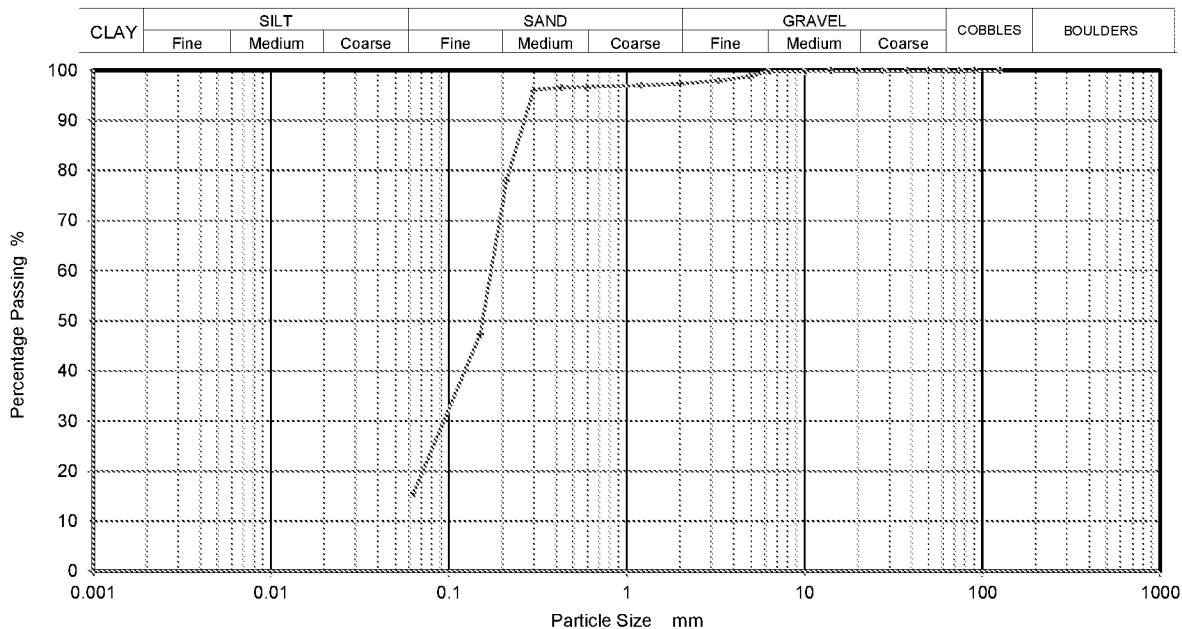
Depth Base

Date Tested

12/08/2021

Sample Type

D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	98		
2	97		
1.18	97		
0.6	97		
0.425	97		
0.3	96		
0.212	78		
0.15	47		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	82
Silt and Clay	15

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 55233

Borehole/Pit No. WS21

Site Name Westergate

Sample No.

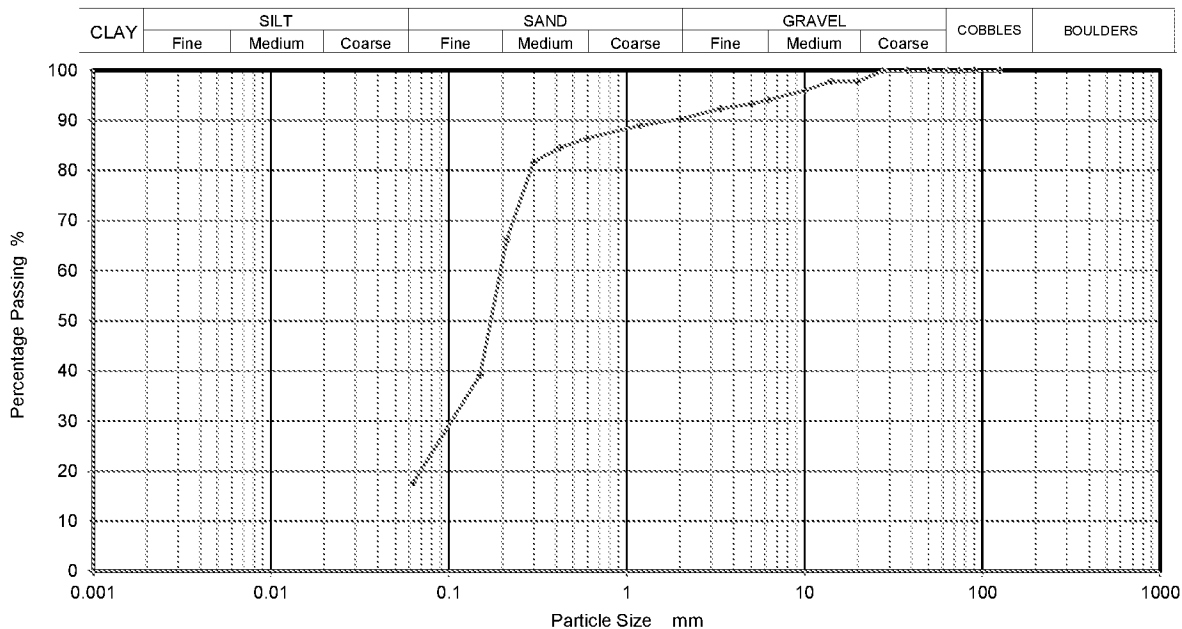
Soil Description Brown fine to coarse gravelly clayey/silty fine to coarse SAND

Depth Top 1.30

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	98		
10	96		
6.3	94		
5	93		
3.35	92		
2	90		
1.18	89		
0.6	86		
0.425	85		
0.3	82		
0.212	66		
0.15	39		
0.063	18		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	72
Silt and Clay	18

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 55233

Borehole/Pit No. WS23

Site Name Westergate

Sample No.

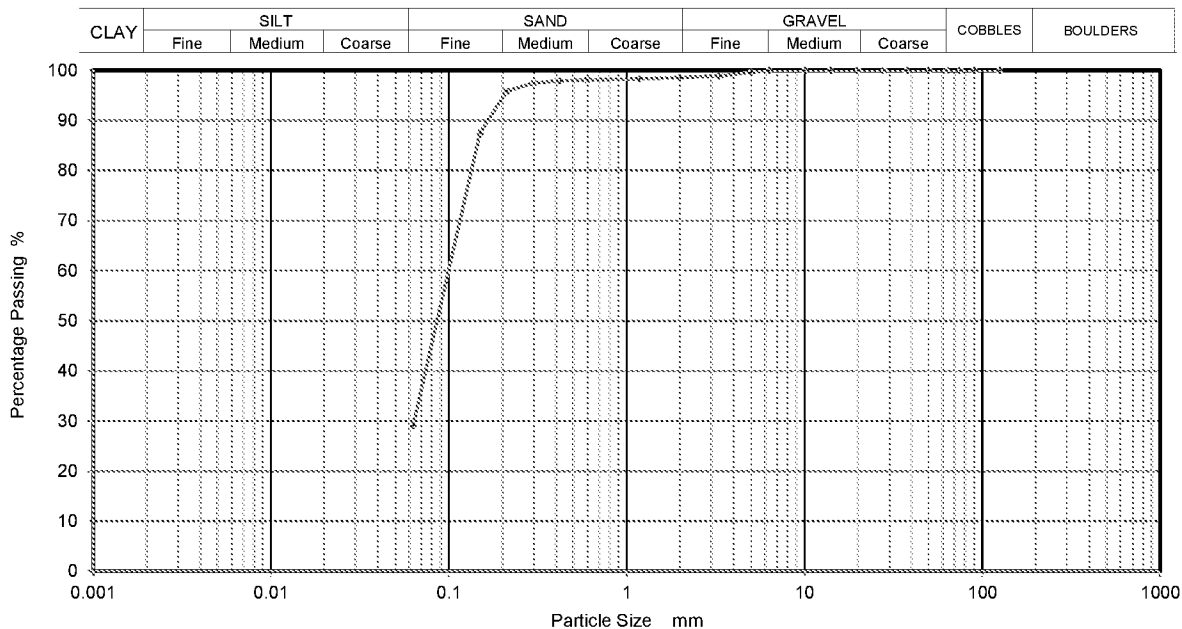
Soil Description Brown slightly fine gravelly clayey/silty fine to coarse SAND

Depth Top 2.10

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	98		
0.425	98		
0.3	98		
0.212	96		
0.15	88		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	70
Silt and Clay	29

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS25

Site Name Westergate

Sample No.

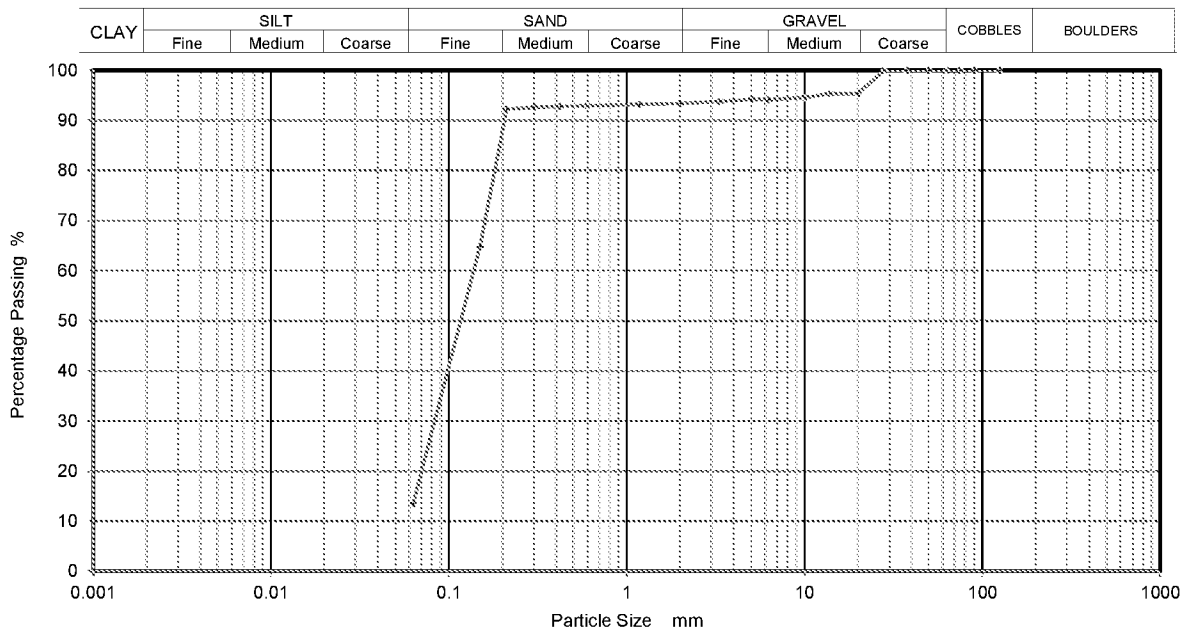
Soil Description Brown slightly fine to coarse gravelly clayey/silty fine to coarse SAND

Depth Top 2.00

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	95		
10	95		
6.3	94		
5	94		
3.35	94		
2	93		
1.18	93		
0.6	93		
0.425	93		
0.3	93		
0.212	92		
0.15	65		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	7
Sand	79
Silt and Clay	14

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 55233

Borehole/Pit No. WS27

Site Name Westergate

Sample No.

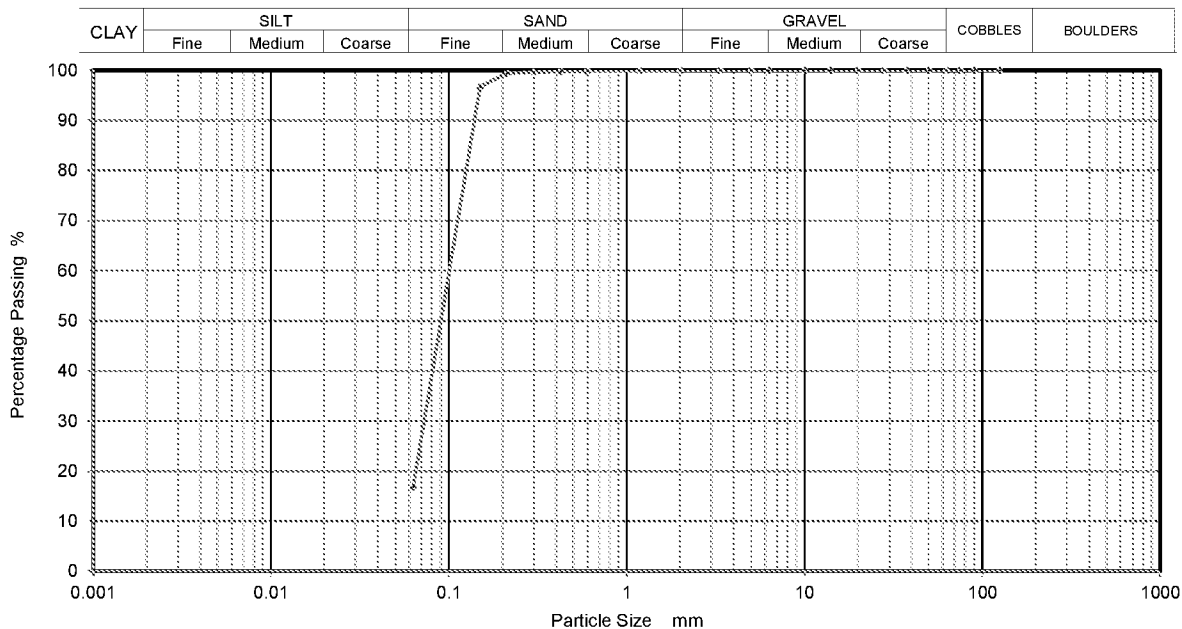
Soil Description Orange brown clayey/silty fine to coarse SAND

Depth Top 1.70

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	97		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	83
Silt and Clay	17

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 55233

Borehole/Pit No. WS28

Site Name Westergate

Sample No.

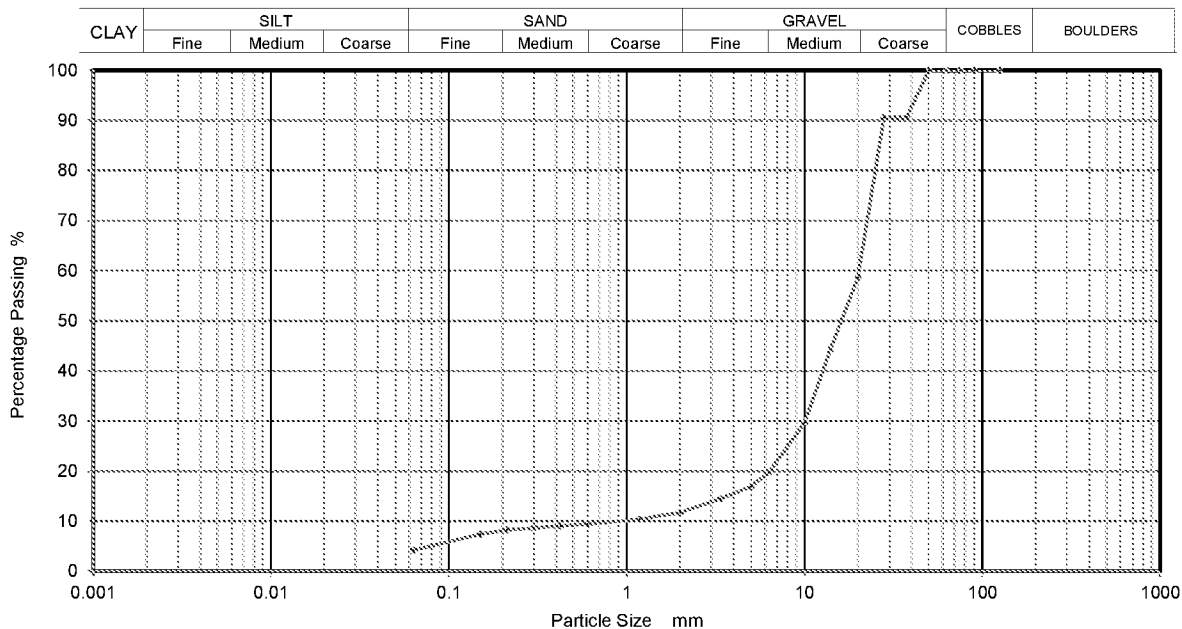
Soil Description Brown slightly clayey/silty slightly fine to coarse sandy fine to coarse GRAVEL

Depth Top 0.90

Depth Base

Date Tested 12/08/2021

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	91		
20	59		
14	44		
10	30		
6.3	20		
5	17		
3.35	14		
2	12		
1.18	10		
0.6	9		
0.425	9		
0.3	9		
0.212	8		
0.15	7		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	88
Sand	8
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/08/2021	Richard John
David	Approved	17/08/2021	Paul Evans





Sam Bevins
Soils Ltd
Newton House
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KT20 5SR

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN

DETS Report No: 21-09694

Site Reference: Westerqate BRE

Project / Job Ref: 19522

Order No: 19522/SB

Sample Receipt Date: 04/08/2021

Sample Scheduled Date: 04/08/2021

Report Issue Number: 1

Reporting Date: 10/08/2021

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate						
DETS Report No: 21-09694	Date Sampled	24/07/21	24/07/21	25/07/21	27/07/21	16/07/21
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Westergate_BRE	TP / BH No	WS01	WS05	WS11	WS16	WS20
Project / Job Ref: 19522	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 19522/SB	Depth (m)	1.50	2.10	1.10	1.20	0.60
Reporting Date: 10/08/2021	DETS Sample No	558142	558143	558144	558145	558146

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	8.1	7.9	8.0	7.9	7.9
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	< 200	< 200	< 200	279
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02	0.03
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	< 10	19	22	< 10
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	0.02	0.02	< 0.01
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Ammonium as NH ₄	mg/kg	< 0.5	MCERTS	2.3	1.8	1.9	2.1	2.4
Ammonium as NH ₄	mg/l	< 0.05	MCERTS	0.23	0.18	0.19	0.21	0.24
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	8	15	15	25	9
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	4.2	7.6	7.4	12.7	4.3
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS	15	< 3	< 3	< 3	7
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS	7.4	< 1.5	< 1.5	< 1.5	3.7
W/S Magnesium	mg/l	< 0.1	NONE	1	1	2.7	2.1	1.3

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 21-09694	Date Sampled	27/07/21				
Soils Ltd	Time Sampled	None Supplied				
Site Reference: Westergate_BRE	TP / BH No	WS27				
Project / Job Ref: 19522	Additional Refs	None Supplied				
Order No: 19522/SB	Depth (m)	1.20				
Reporting Date: 10/08/2021	DETS Sample No	558147				

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	MCERTS	7.5			
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200			
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01			
Total Sulphur	%	< 0.02	NONE	< 0.02			
Ammonium as NH ₄	mg/kg	< 0.5	MCERTS	2.2			
Ammonium as NH ₄	mg/l	< 0.05	MCERTS	0.22			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	5			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	2.5			
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS	3			
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS	1.6			
W/S Magnesium	mg/l	< 0.1	NONE	0.8			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 21-09694

Soils Ltd

Site Reference: Westergate_BRE

Project / Job Ref: 19522

Order No: 19522/SB

Reporting Date: 10/08/2021

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 558142	WS01	None Supplied	1.50	15.4	Brown sand
\$ 558143	WS05	None Supplied	2.10	14	Brown sand
558144	WS11	None Supplied	1.10	14.6	Brown clay
558145	WS16	None Supplied	1.20	16.2	Brown clay
\$ 558146	WS20	None Supplied	0.60	7.4	Brown sandy clay with stones
558147	WS27	None Supplied	1.20	10.2	Brown sand

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{1/5}

\$ samples exceeded recommended holding times



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Unit 1, Rose Lane Industrial Estate
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Lenham Heath
Maidstone
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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 21-09694

Soils Ltd

Site Reference: Westergate_BRE

Project / Job Ref: 19522

Order No: 19522/SB

Reporting Date: 10/08/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCS	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received