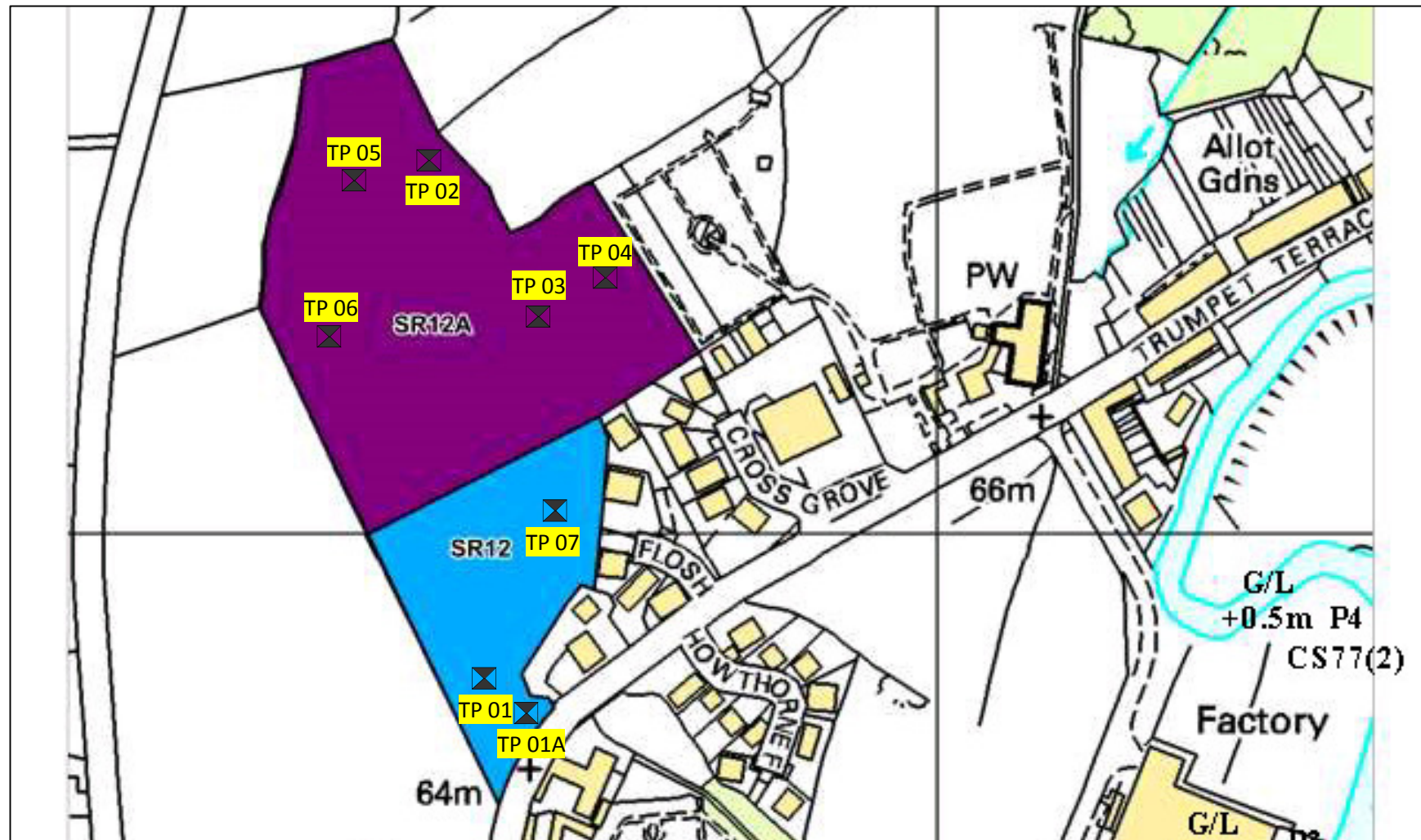
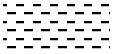
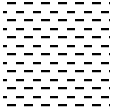
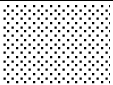


GEO2014-952: Land at Cleator – Exploratory Hole Location Plan (Approximate Locations – Not to Scale)



GEO2014-952: Land at Cleator – TP01

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	Grass over dark brown clayey topsoil with many rootlets.		
0.20	0.40	Firm blue grey CLAY.		
0.40	0.80	Firm brown very sandy very gravelly CLAY.		
0.80	1.10	Brown SAND & GRAVEL. Heavy water ingress noted at base.		
1.10m End of Trial Pit. Pit unstable. Heavy water ingress noted at c.1.10m. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: No test completed due to shallow groundwater ingress.				

Log Details:

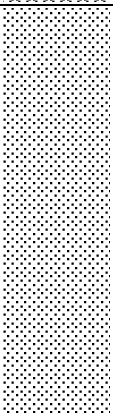
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP01A

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	Grass over dark brown clayey topsoil with many rootlets.		
0.20	1.60	Brown very clayey SAND & GRAVEL. Materials damp with heavy water ingress noted at base.		
1.60m End of Trial Pit. Pit unstable. Heavy water ingress noted at c.1.60m rising to c.1.40m. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecon Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 1.10m to 1.40m depth. Test dropped 110mm in 6 minutes, 130mm in 10 minutes, 135mm in 15 minutes and the pit was dry (damp in base) following 271 minutes total monitoring time.				

Log Details:

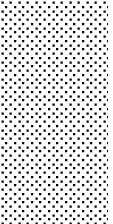
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP02

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	Grass over dark brown clayey topsoil with many rootlets.		
0.20	1.00	Brown very clayey SAND & GRAVEL/very sandy very gravelly CLAY. Materials damp.		
1.00m End of Trial Pit. Pit stable. No water ingress noted. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 1.00m to 1.30m depth. Test dropped 25mm in 5 minutes, falling to 100mm following 227 minutes total monitoring time.				

Log Details:

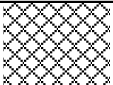
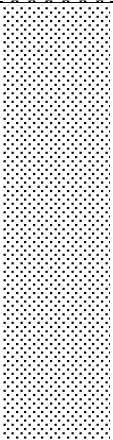
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP03

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	Grass over dark brown clayey topsoil with many rootlets.		
0.30	2.10	Brown very clayey SAND & GRAVEL/very sandy very gravelly CLAY. Materials damp. Heavy water ingress noted at 1.80m.		
2.10m End of Trial Pit. Pit stable. Heavy water ingress noted at 1.80m. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 0.95m to 1.25m depth. Test dropped 30mm in 5 minutes, falling to 115mm following 128 minutes total monitoring time.				

Log Details:

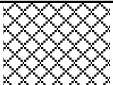
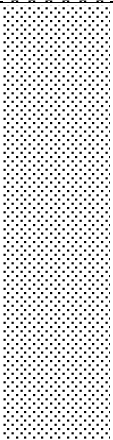
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP04

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	Grass over dark brown clayey topsoil with many rootlets.		
0.30	2.10	Brown very clayey SAND & GRAVEL. Materials damp. Very slight water ingress in pit wall.		
2.10m End of Trial Pit. Pit unstable. Water ingress noted at c.1.75m rising to c.1.65m by 16.40pm. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 1.30m to 1.60m depth. Test dropped 75mm in 5 minutes, remaining at 75mm following 10 minutes. Water level rose to 45mm following 323 minutes total monitoring time.				

Log Details:

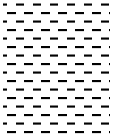
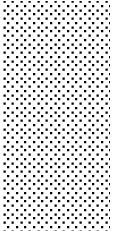
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP05

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.25	Grass over dark brown clayey topsoil with many rootlets.		
0.25	0.75	Firm light brown very sandy very gravelly CLAY		
0.75	1.55	Brown very clayey SAND & GRAVEL/very sandy very gravelly CLAY. Materials damp. Slight water ingress in base.		
1.55m End of Trial Pit. Pit unstable. Slight water ingress noted at c.1.55m. Water level did not rise. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecon Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 0.75m to 1.05m depth. Test dropped 20mm in 10 minutes, falling to 120mm following 103 minutes and was dry following 254 minutes total monitoring time.				

Log Details:

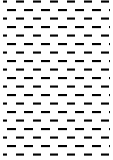
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP06

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.30	Grass over dark brown clayey topsoil with many rootlets.		
0.30	0.90	Firm light brown very sandy very gravelly CLAY		
0.90	1.20	Brown very clayey SAND & GRAVEL. Materials damp. Heavy water ingress in pit wall causing instability.		
1.20m End of Trial Pit. Pit unstable. Heavy water ingress noted at c.1.20m rising to c.0.90m. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 0.70m to 1.00m depth. Test dropped 35mm in 60 minutes, reaching the rising groundwater level of c.0.90m (-200mm in the test pit) following remaining at 75mm following 187 minutes total monitoring time.				

Log Details:

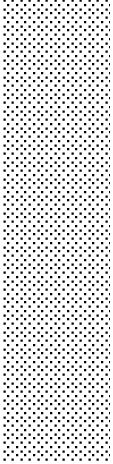
Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



GEO2014-952: Land at Cleator – TP07

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / Samples
0.00	0.20	Grass over dark brown clayey topsoil with many rootlets.		
0.20	2.00	Brown very clayey SAND & GRAVEL/very sandy very gravelly CLAY. Materials damp. Slight water ingress noted at 1.50m. Relic field drain noted.		
2.00m End of Trial Pit. Pit stable. Slight water ingress noted at 1.50m. Grass surfacing soft and very damp. Manual excavation for soil infiltration tests (300mm x 300mm x 300mm). Log Notes: Pit dimensions 0.90m x 1.50m (orientation as plan). B = Bulk Bag (x1), J = Amber Glass Jar (x3), T = Plastic Tub (x1), W = Water (x1), PID = Head Space Analysis (result as ppm), HSV = Hand Shear Vane (result as kN/m²), CBR = Equivalent CBR by Mexecone Penetrometer (result at %), LP = Limited Penetration of Test Tool (HSV/CBR). Soil Infiltration Test: Test completed at 0.90m to 1.20m depth. Test dropped 5mm in 15 minutes. Test abandoned due to water ingress from field drain.				

Log Details:

Client: Mr Mulholland

Engineer: CRE

Plant: JCB 3CX Backhoe Excavator



Soil Infiltration Test								
Time Elapsed		Depth to Water (m) from start of test (test pit 300mm x 300mm x 300mm)						
Minutes	Seconds	TP01A (WS01)	TP02 (WS02)	TP03 (WS03)	TP04 (WS04)	TP05 (WS05)	TP06 (WS06)	TP07
0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	60	0.070	0.015	0.020	0.060	0.010	0.010	Test
2	120	0.080	0.015	0.020	0.075	0.015	0.020	Abandoned
3	180	0.090	0.015	0.020	0.075	0.015	0.020	
4	240	0.090	0.015	0.020	0.075	0.015	0.020	
5	300	0.100	0.020	0.030	0.075	0.015	0.020	
10	600	0.130	0.025	0.030	0.075	0.020	0.020	
15	900	0.135	0.030	0.035			0.020	
30	1800		0.035				0.030	
60	3600		0.045	0.090			0.035	
End of test		0.300	0.100	0.115	0.045	0.300	0.070	
Test duration		278 mins	227 mins	128 mins	323 mins	254 mins	187 mins	
Depth to Groundwater (m)		1.400	None Noted	1.800	1.650	1.550	0.900	

In-Situ Soil Infiltration Tests



RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator

JOB No 2014-952

TP 1A

borehole depth= 0.3 m
L= 0.3 m

WL= 1.4 m
Pit width 0.3 m
Pit length 0.3 m
k=A/FT k=A/(F(t₂-t₁))lnH₁/H₂

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/H ₀	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	1.400	1	2.1386568	0.0706858			
1	60	0.070	0.070	0.230	1.330	0.95	2.1386568	0.0706858	60	0.0512933	2.82553E-05
2	120	0.080	0.080	0.220	1.320	0.942857	2.1386568	0.0706858	60	0.0075472	4.15744E-06
3	180	0.090	0.090	0.210	1.310	0.935714	2.1386568	0.0706858	60	0.0076046	4.18906E-06
4	240	0.100	0.100	0.200	1.300	0.928571	2.1386568	0.0706858	60	0.0076629	4.22116E-06
5	300	0.110	0.110	0.190	1.290	0.921429	2.1386568	0.0706858	60	0.007722	4.25375E-06
10	600	0.130	0.130	0.170	1.270	0.907143	2.1386568	0.0706858	300	0.0156253	1.72147E-06
15	900	0.135	0.020	0.280	1.380	0.985714	2.1386568	0.0706858	300	-0.083067	-9.15159E-06
30	1800	0.135	0.135	0.165	1.265	0.903571	2.1386568	0.0706858	900	0.0870114	3.1954E-06
60	3600	0.135	0.135	0.165	1.265	0.903571	2.1386568	0.0706858	1800	0	0
278	16680	0.300	0.300	0.000	1.100	0.785714	2.1386568	0.0706858	13080	0.1397619	3.53161E-07

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

4.11952E-06

Average permeability = 4.119 x 10⁻⁶ m/s

RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator
 JOB No 2014-952
 TP 2

borehole depth= 0.3 m
 L= 0.3 m

WL= 2 m assumed
 Pit width 0.3 m
 Pit length 0.3 m
 $k=A/FT$ $k=A/(F(t_2-t_1)\ln H_1/H_2)$

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/Ho	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	2.000	1	2.1386568	0.0706858			
1	60	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0.0075283	4.14701E-06
2	120	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0	0
3	180	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0	0
4	240	0.020	0.020	0.280	1.980	0.99	2.1386568	0.0706858	60	0.0025221	1.3893E-06
5	300	0.025	0.025	0.275	1.975	0.9875	2.1386568	0.0706858	60	0.0025284	1.39282E-06
10	600	0.030	0.030	0.270	1.970	0.985	2.1386568	0.0706858	300	0.0025349	2.79269E-07
15	900	0.030	0.020	0.280	1.980	0.99	2.1386568	0.0706858	300	-0.005063	-5.57833E-07
30	1800	0.035	0.035	0.265	1.965	0.9825	2.1386568	0.0706858	900	0.0076046	2.79271E-07
60	3600	0.045	0.045	0.255	1.955	0.9775	2.1386568	0.0706858	1800	0.0051021	9.36836E-08
227	13620	0.100	0.100	0.200	1.900	0.95	2.1386568	0.0706858	10020	0.0285363	9.41285E-08

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

7.11765E-07

Average permeability = 7.117×10^{-7} m/s

RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator

JOB No 2014-952

TP 3

borehole depth= 0.3 m
L= 0.3 m

WL= 1.8 m
Pit width 0.3 m
Pit length 0.3 m
 $k=A/FT$ $k=A/(F(t_2-t_1)\ln H_1/H_2)$

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/Ho	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	1.800	1	2.1386568	0.0706858			
1	60	0.020	0.020	0.280	1.780	0.988889	2.1386568	0.0706858	60	0.0111733	6.15491E-06
2	120	0.020	0.020	0.280	1.780	0.988889	2.1386568	0.0706858	60	0	0
3	180	0.020	0.020	0.280	1.780	0.988889	2.1386568	0.0706858	60	0	0
4	240	0.020	0.020	0.280	1.780	0.988889	2.1386568	0.0706858	60	0	0
5	300	0.030	0.030	0.270	1.770	0.983333	2.1386568	0.0706858	60	0.0056338	3.10344E-06
10	600	0.030	0.030	0.270	1.770	0.983333	2.1386568	0.0706858	300	0	0
15	900	0.035	0.020	0.280	1.780	0.988889	2.1386568	0.0706858	300	-0.005634	-6.20687E-07
30	1800	0.035	0.035	0.265	1.765	0.980556	2.1386568	0.0706858	900	0.0084627	3.10782E-07
60	3600	0.090	0.090	0.210	1.710	0.95	2.1386568	0.0706858	1800	0.0316573	5.8129E-07
128	7680	0.115	0.115	0.185	1.685	0.936111	2.1386568	0.0706858	4080	0.0147278	1.19308E-07

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

9.64904E-07

Average permeability = 9.649×10^{-7} m/s

RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator

JOB No 2014-952

TP 4

borehole depth= 0.3 m
L= 0.3 m

WL= 1.65 m
Pit width 0.3 m
Pit length 0.3 m
 $k=A/FT$ $k=A/(F(t_2-t_1)\ln H_1/H_2)$

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/Ho	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	1.650	1	2.1386568	0.0706858			
1	60	0.060	0.060	0.240	1.590	0.963636	2.1386568	0.0706858	60	0.0370413	2.04045E-05
2	120	0.075	0.075	0.225	1.575	0.954545	2.1386568	0.0706858	60	0.0094787	5.22145E-06
3	180	0.075	0.075	0.225	1.575	0.954545	2.1386568	0.0706858	60	0	0
4	240	0.075	0.075	0.225	1.575	0.954545	2.1386568	0.0706858	60	0	0
5	300	0.075	0.075	0.225	1.575	0.954545	2.1386568	0.0706858	60	0	0
10	600	0.075	0.075	0.225	1.575	0.954545	2.1386568	0.0706858	300	0	0
15	900	0.075	0.020	0.280	1.630	0.987879	2.1386568	0.0706858	300	-0.034325	-3.78162E-06
30	1800	0.045	0.045	0.255	1.605	0.972727	2.1386568	0.0706858	900	0.0154563	5.67614E-07
60	3600	0.045	0.045	0.255	1.605	0.972727	2.1386568	0.0706858	1800	0	0
323	19380	0.045	0.045	0.255	1.605	0.972727	2.1386568	0.0706858	15780	0	0

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

Water Level risen (pit wall collapse?) - Test deemed as fail

RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator

JOB No 2014-952

TP 5

borehole depth= 0.3 m
L= 0.3 m

WL= 2 m assumed
Pit width 0.3 m
Pit length 0.3 m
 $k=A/FT$ $k=A/(F(t_2-t_1)\ln H_1/H_2)$

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/Ho	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	2.000	1	2.1386568	0.0706858			
1	60	0.010	0.010	0.290	1.990	0.995	2.1386568	0.0706858	60	0.0050125	2.7612E-06
2	120	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0.0025157	1.38581E-06
3	180	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0	0
4	240	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0	0
5	300	0.015	0.015	0.285	1.985	0.9925	2.1386568	0.0706858	60	0	0
10	600	0.020	0.020	0.280	1.980	0.99	2.1386568	0.0706858	300	0.0025221	2.77861E-07
15	900	0.020	0.020	0.280	1.980	0.99	2.1386568	0.0706858	300	0	0
30	1800	0.020	0.020	0.280	1.980	0.99	2.1386568	0.0706858	900	0	0
60	3600	0.020	0.020	0.280	1.980	0.99	2.1386568	0.0706858	1800	0	0
254	15240	0.300	0.300	0.000	1.700	0.85	2.1386568	0.0706858	11640	0.1524686	4.32931E-07

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

4.8578E-07

Average permeability = 4.857×10^{-7} m/s

RESULTS OF INSITU SOIL INFILTRATION TESTS

SITE Cleator

JOB No 2014-952

TP 6

borehole depth= 0.3 m
L= 0.3 m

WL= 0.9 m
Pit width 0.3 m
Pit length 0.3 m
 $k=A/FT$ $k=A/(F(t_2-t_1)\ln H_1/H_2)$

Time (mins)	Time (secs)	Water level below start of test (m)	Water level below GL (m)	Water head above borehole base (m)	Water head over existing water level (m)	H/Ho	Intake factor F	Borehole area m ²	t ₂ -t ₁ secs	lnh ₁ /h ₂	Permeability k m/s
0	0	0.000	0.000	0.300	0.900	1	2.1386568	0.0706858			
1	60	0.010	0.010	0.290	0.890	0.988889	2.1386568	0.0706858	60	0.0111733	6.15491E-06
2	120	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	60	0.0112996	6.22446E-06
3	180	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	60	0	0
4	240	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	60	0	0
5	300	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	60	0	0
10	600	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	300	0	0
15	900	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	300	0	0
30	1800	0.020	0.020	0.280	0.880	0.977778	2.1386568	0.0706858	900	0	0
60	3600	0.035	0.035	0.265	0.865	0.961111	2.1386568	0.0706858	1800	0.0171924	3.15686E-07
187	11220	0.200	0.200	0.100	0.700	0.777778	2.1386568	0.0706858	7620	0.2116492	9.18022E-07

Tests analysed in accordance with Hvorslev (BS5930: Section 25.4)

1.36131E-06

Average permeability = 7.117×10^{-6} m/s