APPENDIX A

Windowless Sample Borehole Logs & Photographs

Hammer Energy Test Report

In accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	110.114
Test Date:	09/12/2019
Report Date:	09/12/2019
File Name:	110.114.spt
Test Operator:	AP

Instrumented Rod Data

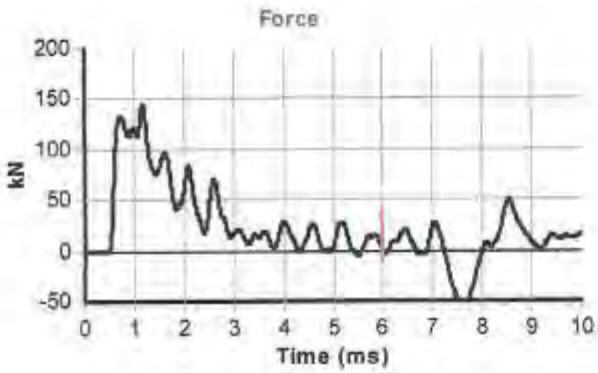
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.9
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	62901
Accelerometer No.2:	62902

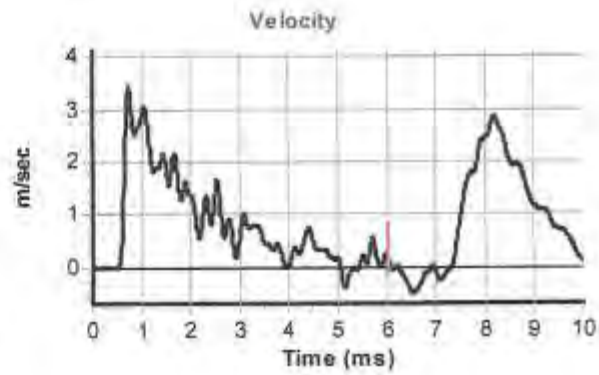
Hammer Information

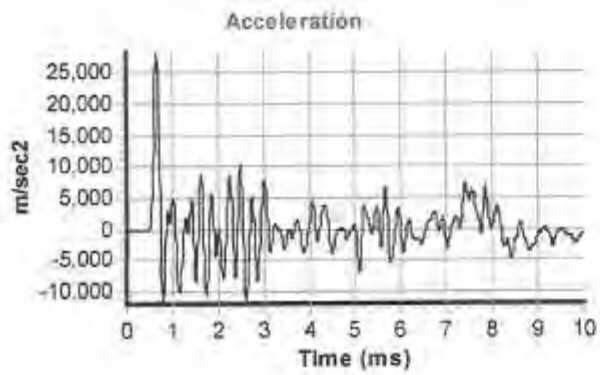
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

Comments / Location

Nicholls colton hammer tested at Dynamic samplings yard.







Calculations

Area of Rod A (mm2):	1021
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	376

Energy Ratio E_r (%): **79**

Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

BOREHOLE RECORD - WS1

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	120mm to 5.42m		G19179

Logged by: NB	Ground Level: 39.991m AOD	Date: 23/03/20	Location: - 440224E, 331865N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.10					MADE GROUND - Brown very clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B2	0.20 - 0.50							
ES3	0.70 - 0.80			39.29	0.70	PROBABLE MADE GROUND - Orangish brown and pale grey clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B4	0.80 - 1.00							
D6	1.10 - 1.20		▼	38.89	1.10			
S	1.20	N=8		38.79	1.20	PROBABLE MADE GROUND - Grey and brown sandy, clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D7	1.20 - 1.65							
D8	1.20 - 1.50			38.49	1.50	Firm reddish brown locally pale grey slightly gravelly, sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D9	1.50 - 1.80							
D10	1.80 - 2.00			38.19	1.80	Stiff very friable reddish brown clayey SILT.		
S	2.00	N=13				Stiff very friable dark reddish brown sandy, slightly clayey SILT/silty fine to coarse SAND with many fine gravel sized mudstone lithorelicts.		
D11	2.00 - 2.50							
D12	2.50 - 3.00							
S	3.00	N=13						
D13	3.00 - 3.45							
D14	3.30 - 3.60							
D15	3.80 - 4.00			36.19	3.80	Banded very stiff friable reddish brown locally pale grey sandy, silty CLAY/ sandy, clayey SILT with occasional to many fine gravel sized mudstone lithorelicts.		
S	4.00	N=40						
D16	4.00 - 4.45							
D17	4.00 - 5.00							
S	5.00	50 for 245mm						
D18	5.00 - 5.42							
				34.56	5.43			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 1.20m at the base of the hand excavated starter pit.
3. On completion the borehole was backfilled with spoil.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS1: Prior to Rigging up Looking North.

Borehole WS1: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS2

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	120mm to 5.00m	120mm to 2.00m	G19179

Logged by: NB	Ground Level: 40.088m AOD	Date: 24/03/20	Location: - 440210E, 331841N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10					MADE GROUND - Brown clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
B2	0.20 - 0.40			39.89	0.20	Orangish brown very clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL with occasional flint cobbles.		
ES3	0.70							
B4	0.80 - 1.00							
			▼	39.09	1.00	Soft pale grey locally orangish brown slightly gravelly CLAY with traces of decayed vegetation (gravel is fine to medium angular siltstone).		
S	1.20	N=12						
D5	1.20 - 1.65							
D6	1.20 - 1.50			38.59	1.50	Stiff very friable reddish brown sandy, clayey SILT.		
D	1.70 - 2.00							
S	2.00	N=20						
D8	2.00 - 2.45							
D9	2.50 - 3.00		▼					
						... Thin band (80mm) of silty mudstone encountered at 2.75m.		
S	3.00	N=33				*... Becoming very stiff from 3.00m.*		
D10	3.00 - 3.45							
	3.30							
D11	3.30 - 3.70							
D12	3.70 - 4.00			36.39	3.70	Very stiff friable very silty CLAY.		
S	4.00	N=30				*... Poor sample recovery from 4.00m to 5.00m, resulting in very small 'D' sample..*		
D13	4.00 - 4.45							
D14	4.00 - 5.00							
				35.59	4.50	Very stiff very friable reddish brown sandy, slightly clayey SILT.		
C	5.00	50 for 170mm		35.09	5.00			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Slight groundwater seepages were encountered at 1.10m towards the base of the hand excavated starter pit, further groundwater seepages encountered at 2.50m.
3. On completion the borehole was backfilled with spoil.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS2: Prior to Rigging up Looking North.

Borehole WS2: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS3

Window Sampler

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	120mm to 5.45m		G19179

Logged by: NB	Ground Level: 40.85m AOD	Date: 23/03/20	Location: - 440236E, 331808N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.10					MADE GROUND - Brown slightly gravelly, slightly sandy clayey TOPSOIL (gravel is medium to coarse sub-angular to rounded quartz).		
B2	0.40 - 0.60			40.45	0.40	MADE GROUND - Stiff brown slightly gravelly, slightly sandy CLAY locally mixed with topsoil (gravel is fine to coarse angular to rounded flint and quartz).		
ES3	0.70							
B4	0.80 - 1.00							
				39.75	1.10	Stiff orangish brown and grey slightly gravelly, sandy CLAY/SILT (gravel is fine to coarse angular to sub-rounded flint, quartz and sandstone).		
S	1.20	N=15						
B6	1.20 - 1.80							
D5	1.20 - 1.65							
D7	1.80 - 2.00			39.05	1.80	Firm orangish/reddish brown and pale grey slightly gravelly, slightly sandy CLAY (gravel is coarse angular flint).		
S	2.00	N=14						
D8	2.00 - 2.45							
D9	2.00 - 2.60					*... Becoming soft from 2.40m.*		
D10	2.60 - 3.00			38.25	2.60	Loose orangish brown and grey sandy, clayey fine to coarse angular to sub-rounded flint, quartz and sandstone GRAVEL with traces of organic matter.		
S	3.00	N=9	▼					
D11	3.00 - 3.45							
D12	3.40 - 3.65			37.45	3.40	Soft orangish brown and grey slightly gravelly, slightly sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D13	3.65 - 4.00			37.20	3.65	Firm very friable reddish brown and pale grey sandy, clayey SILT.		
S	4.00	N=35				*... Becoming very stiff from 4.00m.*		
D14	4.00 - 4.45					*... No sample recovered within sampler from 4.00m to 5.00m.*		
S	5.00	50 for 275mm		35.85	5.00	Very stiff friable reddish brown and pale grey silty CLAY.		
D15	5.00 - 5.45							
				35.40	5.45			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 3.00m during window sampling operations.
3. On completion the borehole was backfilled with spoil.

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS3: Prior to Rigging up.

Borehole WS3: Prior to Rigging up Looking North.

Borehole WS3: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS4

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	120mm to 6.00m	120mm to 2.00m	G19179

Logged by: NB	Ground Level: 40.555m AOD	Date: 24/03/20	Location: - 440225E, 331765N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.00 - 0.10			40.46	0.10	MADE GROUND - Brown gravelly, sandy, clayey TOPSOIL (gravel is fine to coarse angular to rounded flint and quartz).		
B2	0.20 - 0.50					Orangish brown slightly clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
E3	0.70 - 0.80			39.85	0.70	Soft orangish brown gravelly, slightly sandy CLAY with occasional cobbles (gravel is fine to coarse angular to sub-rounded flint and quartz).		
B4	0.80 - 1.00							
S	1.20	N=7		39.46	1.10	Soft reddish brown locally pale grey CLAY.		
D5	1.20 - 1.65							
D6	1.20 - 1.50							
D7	1.70 - 2.00			38.85	1.70	Firm very friable reddish brown clayey SILT with many fine gravel sized mudstone lithorelicts.		
S	2.00	N=7						
D8	2.00 - 2.45		▼			*...Becoming soft from 2.30m.*		
D9	2.70 - 3.00					*... Becoming stiff from 2.70m.*		
S	3.00	N=22						
D10	3.00 - 3.45							
D11	3.70 - 4.00			36.85	3.70	Very stiff friable reddish brown locally pale grey clayey SILT.		
S	4.00	N=30						
D12	4.00 - 4.45							
D13	4.70 - 5.00							
C	5.00	N=17						
D14	5.70 - 6.00							
				34.56	6.00			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.30m during window sampling operations.
3. The borehole collapsed in after removal of the sampler from 6.00m; borehole abandoned and backfilled with spoil.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS4: Prior to Rigging up.

Borehole WS4: Prior to Rigging up Looking North West.

Borehole WS4: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS5

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 5.36m	120mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.104m AOD	Date: 12/12/19 - 13/12/19	Location: - 440259E, 331700N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.20 - 0.30					Brown slightly gravelly, silty fine to medium SAND.		
B2	0.30 - 0.50			40.78	0.32	Orangish brown locally pale grey very clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D3	0.80 - 0.90							
				40.00	1.10	Medium dense orangish brown locally reddish brown very sandy, locally clayey, fine to coarse sub-angular to sub-rounded quartz GRAVEL.		
S	1.20	N=23						
B5	1.20 - 1.90							
D4	1.20 - 1.65							
D6	1.90 - 2.00		▼	39.20	1.90	Orangish brown slightly silty fine to coarse SAND.		
S	2.00	N=12		39.10	2.00	Medium dense orangish brown fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D7	2.00 - 2.45							
D8	2.50 - 2.80			38.60	2.50	Soft reddish brown locally pale grey CLAY.		
D9	2.80 - 3.00			38.30	2.80	Stiff reddish brown locally pale grey silty CLAY.		
S	3.00	N=30						
D10	3.00 - 3.45			37.90	3.20	Medium dense reddish brown locally pale grey green very silty, slightly clayey fine to coarse SAND with occasional fine gravel sized mudstone lithorelicts.		
D11	3.00 - 4.00							
S	4.00	N=28						
D12	4.00 - 4.45							
D13	4.50 - 5.00							
S	5.00	50 for 210mm						
D14	5.00 - 5.36							
				35.80	5.30	Weak reddish brown MUDSTONE.		
				35.74	5.36			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS5: Prior to Rigging up.

Borehole WS5: Prior to Rigging up Looking North.

Borehole WS5: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS6

Window Sampler

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 7.00m	120mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.355m AOD	Date: 12/12/19	Location: - 440283E, 331573N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.20			40.96	0.40	Brown slightly gravelly, silty fine to medium humic SAND (gravel is fine to coarse angular to sub-rounded flint and quartz).		
B2	0.50 - 1.00					Loose orangish brown very sandy, clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B3	1.00 - 1.90							
C	1.20	N=3						
D4	1.90 - 2.00		▼	39.46	1.90	Soft reddish brown locally pale yellow and pale grey green silty CLAY.		
S	2.00	N=4						
D5	2.00 - 2.45							
D6	2.50 - 3.00							
S	3.00	N=10				*... becoming firm from 3.00m.*		
D7	3.00 - 3.45							
D8	3.50 - 4.00			37.85	3.50	Very stiff very friable reddish brown locally pale yellow and grey silty CLAY.		
S	4.00	N=32				*... poor sample recovery from 4.00m to 5.00m.*		
D9	4.00 - 4.45							
D10	4.50			36.85	4.50	Firm reddish brown locally pale grey silty CLAY.		
S	5.00	N=12						
D11	5.00 - 5.45							
D12	5.50 - 6.00			35.76	5.60	Stiff very friable reddish brown locally pale grey and yellow very clayey SILT/very silty CLAY with occasional to many fine to medioum gravel sized mudstone lithorelicts.		
S	6.00	N=10				*... poor sample recovery from 6.00m to 7.00m.*		
D14	6.50 - 7.00							
				34.35	7.00			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS6: Prior to Rigging up.

Borehole WS6: Prior to Rigging up Looking North.

Borehole WS6: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS7

Window Sampler

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 6.23m	120mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.37m AOD	Date: 10/12/19	Location: - 440296E, 331507N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.10					Brown slightly gravelly, silty fine to medium humic SAND (gravel is medium to coarse sub-angular to sub-rounded quartz).		
D2	0.40 - 0.50			41.02	0.35	Soft orangish brown slightly gravelly, sandy CLAY (gravel is medium to coarse sub-angular to rounded quartz).		
HSV	0.50	23 KPa	▼					
B3	0.70 - 0.90			40.67	0.70	Loose orangish brown locally pale grey very clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL. *... poor sample recovery from 1.00m to 2.00m.*		
C	1.00	N=8						
D4	1.00 - 1.50							
D5	1.50 - 2.00			39.87	1.50	Firm orangish brown locally pale grey slightly gravelly, slightly sandy CLAY with many pockets of clayey sand and gravel (gravel is fine to coarse angular to sub-rounded flint and quartz)		
C	2.00	N=8		39.37	2.00	Loose orangish brown very sandy, clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D6	2.00 - 2.50							
D7	2.50 - 3.00			38.87	2.50	Soft reddish brown locally pale grey green silty CLAY.		
S	3.00	N=14				*... with thin bands of pale grey silt including occasional fine gravel sized siltstone lithorelicts from 2.95m.*		
D8	3.00 - 3.45							
D9	3.30 - 3.70			38.07	3.30	*... becoming firm from 3.00m.*		
D10	3.70 - 4.00			37.67	3.70	Firm reddish brown locally pale grey clayey SILT.		
S	4.00	N=15				Stiff very friable reddish brown locally pale grey clayey SILT with many fine gravel sized mudstone lithorelicts.		
				37.17	4.20	Firm reddish brown silty CLAY.		
D11	4.70 - 5.00			36.67	4.70	Stiff friable reddish brown locally pale grey silty CLAY.		
S	5.00	N=26		36.37	5.00	Stiff reddish brown locally pale grey slightly sandy, slightly clayey SILT.		
D12	5.00 - 6.00							
				35.47	5.90	Weak reddish brown MUDSTONE.		
S	6.00	50 for 125mm						
D13	6.00 - 6.45			35.15	6.22			

Remarks and Water Observations

1. Hand dug starter pit to 1.00m to check for any unmapped underground services.
2. Groundwater seepages were encountered within the hand excavated starter pit at 0.70m.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS7: Prior to Rigging up Looking North.

Borehole WS7: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS8

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 7.45m	120mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.802m AOD	Date: 16/12/19	Location: - 440328E, 331782N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
E1	0.20			41.50	0.30	Brown slightly gravelly, sandy, clayey TOPSOIL (gravel is medium to coarse sub-angular to sub-rounded quartz).		
B2	0.50 - 0.60					Soft orangish brown slightly gravelly, very sandy CLAY (gravel is medium to coarse angular to sub-rounded quartz).		
HSV	0.50	25 KPa		41.05	0.75			
B3	0.80 - 1.00					Loose orangish brown slightly sandy, very clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
S	1.20	N=7						
B5	1.20 - 1.80							
D4	1.20 - 1.65							
				40.00	1.80			
S	2.00	N=12	▼			Medium dense orangish brown sandy, slightly clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D6	2.00 - 2.45							
D7	2.00 - 2.70							
D8	2.70 - 3.00			39.10	2.70	Firm friable reddish brown slightly sandy, very silty CLAY/very clayey SILT with many fine to medium gravel sized silty mudstone lithorelicts.		
S	3.00	N=20				*... with a thin band (20mm) of weak silty mudstone at 2.95m.*		
D9	3.00 - 3.45							
D10	3.60 - 4.00							
S	4.00	N=28				*... becoming very stiff from 4.00m.*		
D11	4.00 - 4.45							
				37.40	4.40			
D12	4.50 - 5.00					Very stiff friable reddish brown locally pale grey green silty CLAY with many fine to medium gravel sized mudstone lithorelicts.		
S	5.00	N=14				*... becoming firm from 5.00m.*		
D13	5.00 - 5.45							
D14	5.00 - 6.00							
S	6.00	N=21				*... poor sample recovery from 6.00m to 7.00m.*		
D15	6.00 - 7.00							
S	7.00	N=33		34.80	7.00	Extremely weak highly fractured reddish brown locally pale grey silty MUDSTONE grading to very friable clayey SILT.		
D16	7.00 - 7.45							
				34.35	7.45			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS8: Prior to Rigging up.

Borehole WS8: Prior to Rigging up Looking South.

Borehole WS8: Prior to Rigging up Looking North.

BOREHOLE RECORD - WS9

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 5.92m	120mm to 2.00m	G19179

Logged by: NB	Ground Level: 41.258m AOD	Date: 16/12/19	Location: - 440299E, 331815N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
E1	0.20			40.96	0.30	Brown gravelly, slightly clayey fine to coarse SAND with occasional roots (gravel is fine to coarse angular to sub-rounded flint and quartz).		
B2	0.40 - 0.60					Soft orangish brown very gravelly, slightly sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D3	0.80 - 1.00							
C	1.20	N=7						
B4	1.20 - 2.00							
S	2.00	N=4	▼	39.31	1.95	Soft reddish brown silty CLAY with occasional fine gravel sized mudstone lithorelicts.		
D5	2.00 - 2.45					*... with occasional pale grey sand lenses from 2.30m to 2.50m.*		
D6	2.50 - 3.00					*... locally pale grey green from 2.50m.*		
S	3.00	N=5				*... becoming very friable from 3.00m.*		
D7	3.00 - 3.45							
D8	3.50 - 4.00							
S	4.00	N=5						
D9	4.00 - 4.45							
D10	4.80 - 5.00			36.46	4.80	Very stiff very friable reddish brown locally pale grey green very clayey SILT/very silty CLAY.		
S	5.00	N=31						
D11	5.00 - 5.45							
D12	5.00 - 5.50							
S	5.50	50 for 265mm		35.76	5.50	Extremely weak reddish brown MUDSTONE.		
D13	5.50 - 5.92							
				35.34	5.92			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS9: Prior to Rigging up.

Borehole WS9: Prior to Rigging up Looking North.

Borehole WS9: Prior to Rigging up Looking South.

BOREHOLE RECORD - WS10

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	120mm to 7.00m	110mm to 6.00m	G19179

Logged by: NB	Ground Level: 40.555m AOD	Date: 23/03/20	Location: - 440303E, 331868N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.10					MADE GROUND - Turf over orangish brown very clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
B2	0.30 - 0.50							
B3	0.90 - 1.20							
				39.56	1.00			
S	1.20	N=7	▼			MADE GROUND - Soft orangish brown and grey gravelly, sandy CLAY with many pockets of sandy, clayey GRAVEL and occasional decaying organic matter with a slight organic odour.		
B6	1.20 - 1.80							
D5	1.20 - 1.65							
ES4	1.20							
				38.76	1.80			
S	2.00	N=28				Medium dense orangish brown and grey sandy, clayey fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D7	2.00 - 2.45							
D8	2.00 - 3.00							
S	3.00	N=10		37.56	3.00	Stiff very friable reddish brown and pale grey sandy, clayey SILT.		
D10	3.00 - 4.00							
D9	3.00 - 3.45							
S	4.00	N=20				*... With many fine gravel sized mudstone lithorelicts from 4.00m to 4.40m.*		
D11	4.00 - 4.45							
D12	4.00 - 5.00					*... Banded with stiff very silty CLAY from 4.40m.*		
S	5.00	28 for 225mm				*... Becoming very stiff from 5.00m.*		
D13	5.00 - 5.45							
D14	5.00 - 5.50							
D15	5.50 - 6.00			35.06	5.50	Very stiff very friable reddish brown and pale grey sandy SILT with many occasional to many fine gravel sized mudstone lithorelicts.		
S	6.00	N=49				*... No sample recovered within sampler from 6.00m to 7.00m.*		
D16	6.00 - 6.45							
C	7.00	50 for 230mm		33.56	7.00			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at the base of the hand excavated starter pit at 1.20m.
3. Borehole formed using a Commachio 205 rotary rig in percussive mode to 6.00m followed by rotary coring from 6.00m to 7.00m (no recovery).
4. The borehole was backfilled with bentonite pellets.

AGS

WINDOWLESS SAMPLE BOREHOLE PHOTOGRAPHS

Borehole WS10: Prior to Rigging up.

Borehole WS10: Prior to Rigging up Looking North.

Borehole WS10: Prior to Rigging up Looking South.

Borehole WS10: Prior to Rigging up on Completion of Starter Pit, Note the Marshy Ground.

Borehole WS10: Close up of Starter Pit Spoil Heap.

Borehole WS10: Close up of Starter Pit Plan View.

Borehole WS10: Starter Pit Internal View.

BOREHOLE RECORD - WS11

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 6.45m		G19179

Logged by: NB	Ground Level: 40.641m AOD	Date: 11/02/20	Location: - 440192E, 331945N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.10					Brown TOPSOIL.		
B2	0.30 - 0.50			40.37	0.27	Orangish brown gravelly, very clayey fine to coarse SAND (gravel is medium to coarse angular to sub-rounded flint and quartz).		
D3	0.60 - 0.70			40.14	0.50	Stiff orangish brown locally mottled dark brown slightly gravelly, slightly sandy CLAY (gravel is medium to coarse angular to sub-rounded flint and quartz).		
D4	1.00			39.84	0.80	Soft orangish brown slightly gravelly, sandy CLAY (gravel is medium to coarse angular to sub-rounded flint and quartz).		
S	1.20	N=4		39.44	1.20	Soft orangish brown and pale grey slightly gravelly, slightly sandy CLAY (gravel is fine to coarse angular to sub-rounded quartz, sandstone and siltstone).		
D5	1.20 - 1.65							
D6	1.20 - 1.50							
S	2.00	N=8		38.64	2.00	Firm grey and brown slightly gravelly CLAY (gravel is fine to medium angular to sub-rounded quartz, siltstone and sandstone).		
D7	2.00 - 2.45							
D8	2.30 - 2.70							
D9	2.70 - 3.00			37.94	2.70	Stiff to very stiff greyish brown sandy, slightly gravelly CLAY with occasional cobbles (gravel is fine to coarse angular to sub-rounded quartz, siltstone and chalk). *... poor sample recovery from 3.00m to 4.00m as pushing a cobble and blocking sample tube entry.*		
S	3.00	N=36						
D10	3.00 - 3.45							
D11	3.00 - 4.00							
S	4.00	N=13		36.64	4.00	Firm to stiff reddish brown and pale grey CLAY.		
D12	4.00 - 4.45							
D13	4.00 - 4.80							
D14	4.81 - 5.00			35.84	4.80	Weak reddish brown SILTSTONE.		
S	5.00	N=22		35.83	4.81	Stiff reddish brown and pale greyish green sandy, silty CLAY with many thin bands of silty fine to coarse sand.		
D15	5.00 - 5.45							
D16	5.00 - 6.00							
S	6.00	N=15				*... borehole collapsed in after SPT at 6.00m; borehole abandoned.*		
D17	6.00 - 6.45							
				34.19	6.45			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. Groundwater standing within the borehole at 1.12m on completion of drilling.
4. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

BOREHOLE RECORD - WS12

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 7.45m	112mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.56m AOD	Date: 11/02/20	Location: - 440155E, 332012N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.20					Brown gravelly, sandy TOPSOIL (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D2	0.40			41.21	0.35	Orangish brown gravelly, clayey fine to coarse SAND (gravel is medium to coarse angular to sub-rounded flint and quartz).		
B3	0.60 - 0.80			40.96	0.60	Orangish brown clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL with occasional cobbles.		
D4	0.85 - 1.00			40.71	0.85	Orangish and reddish brown locally pale grey sandy, very clayey fine to coarse angular to sub-rounded flint, quartz and sandstone GRAVEL.		
C	1.20	N=7						
D5	1.20 - 1.40			40.16	1.40	Firm orangish and reddish brown locally mottled dark greyish brown gravelly, sandy CLAY (gravel is medium to coarse sub-angular to sub-rounded quartz and sandstone).		
D6	1.40 - 1.65							
D7	1.65 - 2.00			39.91	1.65	Dense orangish brown sandy, slightly clayey fine to coarse angular to sub-rounded flint, quartz and sandstone GRAVEL.		
C	2.00	N=36						
B8	2.00 - 2.75							
D9	2.75 - 3.00			38.81	2.75	Very stiff greyish brown slightly gravelly CLAY with occasional cobbles (gravel is medium to coarse angular to sub-rounded flint, quartz, siltstone and chalk).		
C	3.00	N=31						
B10	3.00 - 4.00							
S	4.00	N=33						
D11	4.00 - 4.45							
D12	4.50 - 4.80			37.06	4.50	Very stiff greyish brown slightly gravelly, slightly sandy, slightly clayey SILT with occasional cobbles (gravel is medium to coarse angular to sub-rounded flint, quartz, siltstone and chalk).		
S	4.80	N=35						
D13	4.80 - 5.25							
D14	5.50 - 6.00							
S	6.00	N=48						
D15	6.00 - 6.50							
D16	6.75 - 7.00			34.81	6.75	Very stiff reddish and pale pinkish brown silty CLAY.		
S	7.00	50 for 295mm		34.56	7.00	Weak pale orangish brown fine to coarse grained SANDSTONE (recovered as sandstone fragments either bedrock strata or a cobble).		
D17	7.00 - 7.44			34.46	7.10	Very stiff reddish and pale pinkish brown silty CLAY.		
				34.11	7.45			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.70m during window sampling operations.
3. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

BOREHOLE RECORD - WS13

Window Sampler

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	100mm to 4.45m	112mm to 3.00m	G19179

Logged by: NB	Ground Level: 42.032m AOD	Date: 12/02/20	Location: - 440100E, 332068N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
ES1	0.20					Brown gravelly, very sandy TOPSOIL (gravel is medium to coarse angular to sub-rounded flint and quartz).		
B2	0.40 - 0.60			41.73	0.30	Orangish brown slightly clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B3	0.80 - 1.00			41.43	0.60	Orangish brown fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL with occasional cobbles.		
B4	1.10 - 2.00			40.93	1.10	Loose orangish and dark brown locally pale grey clayey very sandy fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
C	1.20	N=6						
C	2.00	N=24	▼	40.03	2.00	Medium dense orangish brown sandy fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
D5	2.00 - 2.60							
D6	2.70 - 3.00					*... with a thin band of sand from 2.60m to 2.70m.*		
C	3.00	N=35						
B7	3.00 - 3.70					*... becoming dense from 3.00m; unable to progress casing any deeper.*		
D8	3.50 - 3.70			38.53	3.50	Stiff orangish/reddish brown and pale grey slightly gravelly, sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D9	3.70 - 4.00			38.33	3.70			
S	4.00	N=25				Stiff greyish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded quartz, chalk and siltstone).		
D10	4.00 - 4.45					*... borehole collapsed in after SPT test at 4.00m; borehole abandoned.*		
				37.58	4.45			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m during window sampling operations.
3. Groundwater standing within the borehole at 2.03m on completion of drilling.
4. On completion the borehole was backfilled with the accumulated spoil arisings.

AGS

A P P E N D I X B

Cable Percussion Borehole Logs & Photographs

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

BH's BH1, BH2, BH5 & BH6

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref:	BHS004
Test Date:	20/09/2019
Report Date:	20/09/2019
File Name:	BHS004.spt
Test Operator:	CR

Instrumented Rod Data

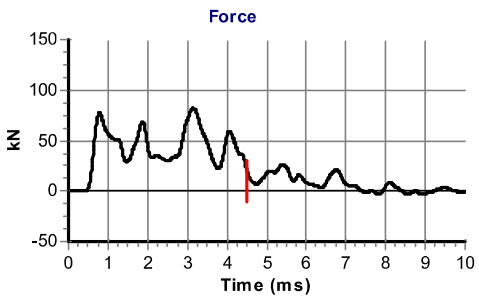
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.3
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	11941
Accelerometer No.2:	11942

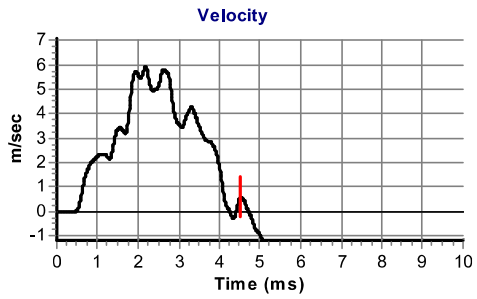
SPT Hammer Information

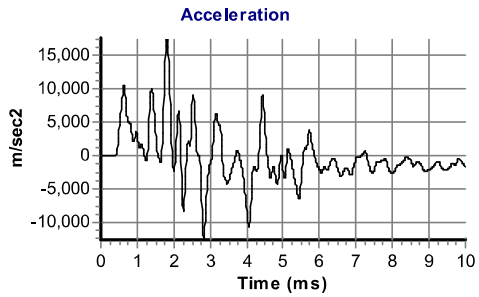
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	15.0

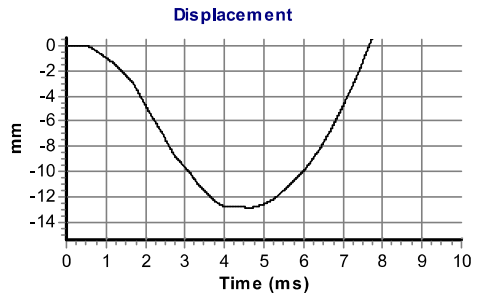
Comments / Location

Recommended calibration interval is 6 months









Calculations

Area of Rod A (mm2):	944
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	355

Energy Ratio E_r (%): 75

CR

Signed: CR

Title: Operator

SPTMAN ver.2.00 All rights reserved, Testconsult ©2010

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

BH's BH3 and BH7R-BH10 Inclusive

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref:	BS03D
Test Date:	03/01/2020
Report Date:	03/01/2020
File Name:	BS03D.spt
Test Operator:	CR

Instrumented Rod Data

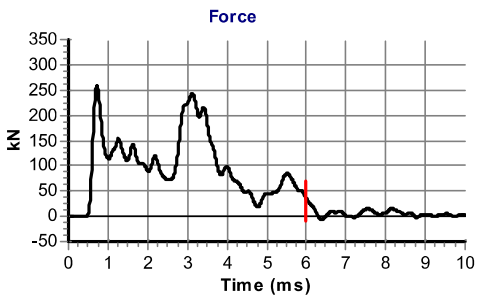
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.3
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	11941
Accelerometer No.2:	11942

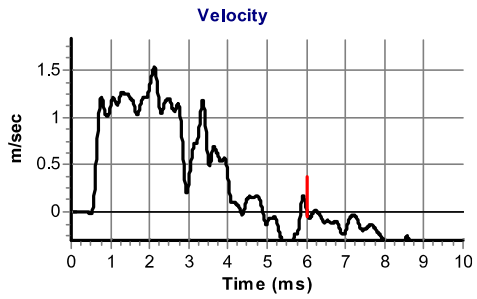
SPT Hammer Information

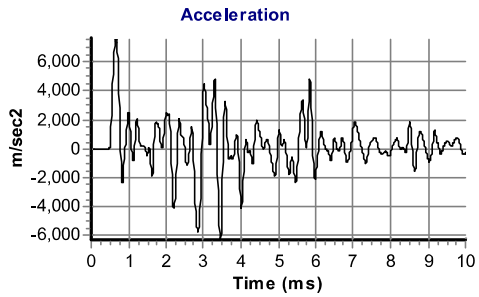
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	15.0

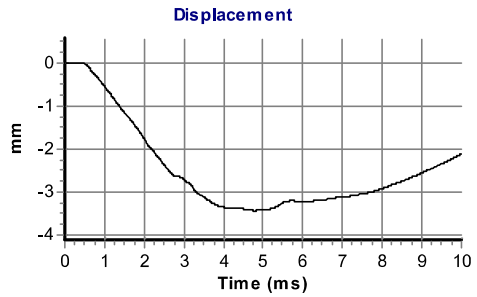
Comments / Location

Recommended calibration interval is 6 months









Calculations

Area of Rod A (mm2):	944
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	396

Energy Ratio E_r (%): 84

CR

Signed: CR

Title: Operator

SPTMAN ver.2.00 All rights reserved, Testconsult ©2010

BOREHOLE RECORD - BH1

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 8.10m	150mm to 7.90m	G19179

Logged by: NB	Ground Level: 41.165m AOD	Date: 12/12/19 - 13/12/19	Location: - 440244E, 331769N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
E1	0.10					Brown slightly gravelly, sandy, clayey TOPSOIL (gravel is medium to coarse sub-angular to sub-rounded quartz).		
B1	0.40 - 0.60			40.76	0.40	Orangish brown very clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
E3	0.70							
B2	0.80 - 1.00							
S	1.20	N=11						
B3	1.20 - 1.70			39.86	1.30	Soft to firm orangish and reddish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded siltstone, sandstone and quartz).		
D4	1.20							
UT1	2.00 - 2.45	(50)		39.16	2.00	Stiff very friable reddish brown locally pale grey green and yellow clayey SILT with occasional fine gravel sized silty mudstone lithorelicts.		
D5	2.50							
S	3.00	N=27		38.16	3.00	Stiff very friable reddish brown very clayey SILT/very silty CLAY with many fine to coarse gravel sized silty mudstone lithorelicts.		
B4	3.00 - 3.50							
D6	3.00							
UT2	4.00 - 4.45	(50)						
D7	4.50							
D8	4.90							
S	5.00	N=11				*...becoming firm from 5.00m.*		
D9	6.00			35.16	6.00	Very stiff very friable dark reddish brown clayey SILT with occasional fine gravel sized silty mudstone lithorelicts.		
S	6.50	50 for 225mm		34.66	6.50	Extremely weak highly fractured reddish brown silty MUDSTONE grading to clayey SILT.		
D10	6.50							
C	7.70	50 for 65mm		33.47	7.70	Weak highly fractured reddish brown MUDSTONE.		
D11	7.70							
C	8.00	50 for 70mm						
D12	8.00			33.06	8.10			

Remarks and Water Observations

1. Obtaining dumper and towing rig to and from borehole location; transporting materials and backfilling earlier boreholes; 3.5 hours. 2. Hand dug starter pit to 1.20m to check for any unmapped underground services. 3. Groundwater seepages were encountered at 2.50m (casing at 1.50m) rising to 2.00m after 20 minutes, sealed off at 3.00m. 4. Further groundwater seepages were encountered at 4.90m (casing at 4.50m) rising to 3.60m, sealed off at 5.70m and 7.70m (casing at 7.50m) rising to 3.00m, not sealed off. 6. Chiselling on mudstone from 7.70m to 8.00m; 0.75 hours. 7. Gas/groundwater monitoring pipe (slotted from 1.00m to 8.00m) installed to base of borehole at 8.10m.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH1: Prior to Rigging up Looking North.

Borehole BH1: Prior to Rigging up Looking South.

Borehole BH1: Starter Pit Spoil Heap.

Borehole BH1: Starter Pit Plan View.

Borehole BH1: Starter Pit Internal View.

BOREHOLE RECORD - BH2

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 7.00m	150mm to 6.20m	G19179

Logged by: NB	Ground Level: 41.849m AOD	Date: 16/12/19	Location: - 440305E, 331780N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
E1	0.20			41.55	0.30	Brown slightly gravelly, sandy, clayey TOPSOIL (gravel is medium to coarse sub-angular to sub-rounded quartz).		
B1	0.40 - 0.60					Orangish brown silty, slightly clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B2	0.80 - 1.00			41.10	0.75	Medium dense orangish brown fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
E2	0.80							
C	1.20	N=16						
B3	1.20 - 1.70							
D4	1.20 - 1.65							
C	2.00	N=14		39.85	2.00	Medium dense orangish brown slightly silty fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B4	2.00 - 2.50							
D5	2.00							
C	3.00	N=8						
B5	3.00 - 3.50							
D6	3.00			38.55	3.30	Soft friable reddish brown locally pale grey very clayey SILT/ very silty CLAY with many fine gravel sized mudstone lithorelicts. *...becoming firm from 3.60m.*		
S	4.00	50 for 285mm				*...becoming very stiff from 4.00m.*		
B6	4.00 - 4.50							
D6	4.00							
				37.35	4.50	Extremely weak highly fractured reddish brown silty MUDSTONE grading to clayey SILT.		
UT1	5.40 - 5.85	(50)		36.45	5.40	Firm reddish brown locally pale grey green silty CLAY with many fine to medium silty mudstone lithorelicts.		
D8	5.85							
				35.65	6.20	Weak highly fractured reddish brown locally pale grey silty MUDSTONE.		
S	6.40	50 for 225mm						
D9	6.40							
				34.85	7.00			

Remarks and Water Observations

1. Obtaining dumper and towing rig to and from borehole location; 1 hour. 2. Hand dug starter pit to 1.20m to check for any unmapped underground services. 3. Groundwater seepages were encountered at 3.90m (casing at 3.80m) rising to 3.00m after 20 minutes, sealed off at 5.00m. 4. Further groundwater seepages were encountered at 6.60m (casing at 6.20m) rising to 3.20m, not sealed off. 5. Chiselling on mudstone from 4.50m to 5.40m; 0.5 hours and 6.40m to 6.90m; 0.5 hours. 6. Gas/groundwater monitoring pipe (slotted from 1.00m to 7.00m) installed to base of borehole at 7.00m.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH2: Prior to Rigging up Looking North.

Borehole BH2: Prior to Rigging up Looking South.

Borehole BH2: Starter Pit Spoil Heap.

Borehole BH2: Starter Pit Plan View.

Borehole BH2: Starter Pit Internal View.

Borehole BH2: Following Completion & Installation of Groundwater/Gas Monitoring Pipe.

Borehole BH2: Following Completion & Installation of Groundwater/Gas Monitoring Pipe.

BOREHOLE RECORD - BH3

Cable Percussion

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 7.70m	150mm to 4.50m	G19179

Logged by: NB	Ground Level: 40.093m AOD	Date: 23/03/20	Location: - 440227E, 331847N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10					MADE GROUND - Soft brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
B2	0.40 - 0.60							
ES3	0.70 - 0.80			39.39	0.70			
B4	0.80 - 1.00					Soft orangish brown and pale grey gravelly, slightly sandy CLAY (gravel is fine to coarse angular to rounded flint and quartz).		
C	1.20	N=5		38.99	1.10			
B5	1.20 - 1.50					Soft reddish brown and pale grey slightly gravelly CLAY (gravel is medium to coarse sub-rounded to rounded quartz).		
D6	1.80 - 2.00							
S	2.00	N=8		38.09	2.00			
D7	2.00 - 2.45					Firm very friable reddish brown locally pale grey sandy, clayey SILT.		
						... becoming stiff from 2.30m.		
UT8	3.00 - 3.45	(98)		37.09	3.00			
						Very stiff very friable reddish brown locally pale grey sandy, slightly clayey SILT with occasional fine to medium gravel sized mudstone lithorelicts.		
D9	3.45 - 3.50							
D10	3.50 - 4.00							
S	4.00	N=38						
D11	4.00 - 4.45							
UT12	5.00 - 5.45	(80)						
				34.79	5.30			
D13	5.45 - 5.50					Very stiff very friable reddish brown and grey very silty CLAY.		
B14	5.50 - 6.00							
S	6.50	N=50		33.59	6.50			
D15	6.50 - 6.94					Very stiff very friable reddish brown and grey very silty CLAY grading to extremely weak MUDSTONE.		
S	7.50	50 for 80mm						
D16	7.50 - 7.70			32.39	7.70			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m (casing at 1.50m) rising to 1.60; 5 mins, 1.40m; 10 mins, 1.30; 15 mins & 1.25m; 20 mins, not sealed off.
3. Chiselling on hard strata from 7.30m to 7.50m; 40 mins.
4. On completion the borehole was backfilled with a mixture of bentonite pellets and spoil.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH3: Prior to Rigging up.

Borehole BH3: Prior to Rigging up Looking North.

Borehole BH3: Prior to Rigging up Looking South.

Borehole BH3: Starter Pit Spoil Heap.

Borehole BH3: Starter Pit Plan View.

Borehole BH3: Starter Pit Internal View.

BOREHOLE RECORD - BH5

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 7.20m	150mm to 6.50m	G19179

Logged by: NB	Ground Level: 41.063m AOD	Date: 10/12/19 - 12/12/19	Location: - 440270E, 331634N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
E1	0.10					Orangish brown slightly gravelly, silty SAND (gravel is medium to coarse aub-angular to sub-rounded quartz).		
B2	0.40 - 0.60			40.71	0.35	Orangish brown very clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
E3	0.70			40.36	0.70	Soft orangish brown locally pale grey slightly gravelly, sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
D4	0.80 - 1.00							
W5	1.00							
S	1.20	N=23		39.96	1.10	Firm orangish brown, pale grey and dark brown mottled slightly gravelly, slightly sandy CLAY (gravel is medium to coarse sub-angular to sub-rounded quartz).		
D5	1.20 - 1.65							
				39.36	1.70	Orangish brown very clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
S	2.00	N=6		39.06	2.00	Soft orangish brown slightly gravelly, very sandy CLAY (gravel is fine to coarse angular to rounded flint and quartz)		
B3	2.00 - 2.50							
D6	2.00			38.76	2.30	Soft orangish brown gravelly, sandy CLAY (gravel is fine to coarse angular to sub-rounded flint and quartz).		
S	3.00	N=9		38.06	3.00	Firm orangish and reddish brown locally pale grey and yellow silty CLAY.		
B4	3.00 - 3.50							
D7	3.00							
				37.56	3.50	Stiff very friable reddish brown locally pale grey very clayey SILT/very silty CLAY.		
UT1	4.00 - 4.45	(50)						
D8	4.50							
C	5.10	50 for 275mm				*...becoming very stiff from 5.10m.*		
D9	5.10							
D10	5.70			35.36	5.70	Very stiff very friable reddish brown locally pale grey silty CLAY interbanded with extremely weak highly fractured MUDSTONE.		
D11	6.00							
C	6.50	50 for 70mm		34.56	6.50	Weak reddish brown silty MUDSTONE.		
B5	6.50 - 7.00							
D12	6.50							
D13	7.00							
S	7.10	50 for 55mm		33.86	7.20			

Remarks and Water Observations

1. Waiting to obtain dumper and towing rig to and from borehole location; 1.5 hours. 2. Hand dug starter pit to 1.20m to check for any unmapped underground services. 3. Groundwater seepages were encountered within the hand excavated pit at 1.00m rising to 0.70m. 4. Further groundwater seepages were encountered at 4.20m (casing at 3.00m) rising to 3.70m, sealed off at 4.50m, 5.30m (casing at (4.5m) rising to 5.00m; sealed off at 5.70m and 6.50m (casing at 6.40m) rising to 3.50m; not sealed off. 5. Chiselling on mudstone from 6.50m to 7.0m; 0.75 hours. 6. On completion the borehole was backfilled with mixed bentonite pellets and arisings.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH5: Prior to Rigging up Looking South.

Borehole BH5: Prior to Rigging up Looking North.

Borehole BH5: Starter Pit Spoil Heap.

Borehole BH5: Starter Pit Plan View.

Borehole BH5: Starter Pit Internal View.

BOREHOLE RECORD - BH6

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 6.80m	150mm to 5.70m	G19179

Logged by: NB	Ground Level: 41.71m AOD	Date: 09/12/19 - 10/12/19	Location: - 440258E, 331481N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
E1	0.10					Brown gravelly, slightly sandy TOPSOIL (gravel is medium to coarse angular to sub-rounded flint and quartz).		
B2	0.30 - 0.50			41.41	0.30	Orangish brown very gravelly, silty, clayey fine to coarse SAND with many pockets of soft slightly gravelly, sandy clay (gravel is fine to coarse angular to rounded flint and quartz).		
B3	0.80 - 1.00							
W4	1.10			40.71	1.00	Medium dense moist orangish brown silty fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
C	1.20	N=24						
D5	1.20 - 2.00							
				39.91	1.80	Medium dense orangish brown silty fine to medium SAND with occasional pockets of soft sandy clay.		
C	2.00	N=11						
D6	2.00 - 2.50							
S	3.00	N=6				*...becoming loose from 3.00m.*		
B8	3.00 - 4.00			38.51	3.20	Soft reddish brown locally pale grey clayey SILT.		
D7	3.00 - 3.45							
				38.01	3.70	Stiff very friable reddish brown locally pale grey green clayey SILT with many fine gravel sized silty mudstone litorelicts. *...with a thin band (20mm) of weak mudstone at 3.90m.*		
C	4.20	N=30						
D9	4.20 - 4.65							
C	5.00	N=25						
B11	5.00 - 5.50							
D10	5.00							
D12	6.20			35.51	6.20	Weak reddish brown silty MUDSTONE with occasional thin bands of very stiff very friable silty clay.		
C	6.30	50 for 65mm						
D13	6.30							
S	6.80	50 for 55mm		34.91	6.80			
D14	6.80							

Remarks and Water Observations

1. Attend site induction and transport rig to borehole location across soft ground; 1 hour. 2. Hand dug starter pit to 1.20m to check for any unmapped underground services. 3. Groundwater seepages were encountered at the base of the hand pit at 1.10m rising to 0.95m after 20 minutes. 4. Further groundwater seepages were encountered at 6.00m (casing at 5.70m) rising to 4.80m, not sealed off. 5. Chiselling on mudstone from 6.20m to 6.80m; 0.75 hours. 6. On completion the borehole was backfilled with mixed bentonite pellets and arisings.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH6: Prior to Rigging up Looking West.

Borehole BH6: Prior to Rigging up Looking East.

Borehole BH6: Starter Pit Spoil Heap.

Borehole BH6: Starter Pit Plan View.

Borehole BH6: Starter Pit Internal View.

Borehole BH6: After Completion & Backfilling.

BOREHOLE RECORD - BH8

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 10.38m	150mm to 3.00m	G19179

Logged by: NB	Ground Level: 41.256m AOD	Date: 18/03/20	Location: - 440175E, 331979N	Scale: 1:55

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10					Brown TOPSOIL.		
B2	0.30 - 0.50			40.92	0.34	Loose orangish brown clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B3	0.90 - 1.10							
C	1.20	N=5				*... Becoming very clayey from 1.20m.*		
D5	1.20 - 1.50							
ES4	1.20							
D6	1.50 - 2.00							
C	2.00	N=14		39.26	2.00	Medium dense orangish brown sandy fine to coarse angular to rounded flint and quartz GRAVEL.		
D7	2.00 - 3.00							
C	3.00	N=9						
B8	3.20 - 4.00			38.06	3.20	Stiff greyish brown slightly gravelly CLAY with occasional pale brown sandy silt partings (Gravel is fine to coarse angular to sub-rounded flint, quartz, chalk and mudstone).		
UT9	4.00 - 4.45	(80)						
D10	4.45 - 4.50							
D11	4.50 - 5.00							
S	5.00	N=20						
D12	5.00 - 5.45							
D13	5.50 - 6.00							
D14	6.00 - 6.50							
UT15	6.50 - 6.95	(80)						
D16	6.95 - 7.00			34.26	7.00	Very stiff friable reddish brown slightly gravelly, silty CLAY (gravel is fine to medium angular to sub-rounded flint, quartz, siltstone and mudstone).		
D17	7.00 - 7.50							
D18	7.50							
S	8.00	50 for 230mm						
D19	8.00 - 8.38							
B21	9.00 - 9.50			32.26	9.00	Very stiff reddish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-angular siltstone and tabular mudstone).		
D20	9.00 - 9.10							
UT22	9.50 - 10.00	(90)						
D23	9.95 - 10.00			31.26	10.00	Very stiff reddish brown CLAY with rare fine sub-angular to sub-rounded chalk gravel.		
S	10.00	50 for 230mm						
D24	10.00 - 10.38			30.88	10.38			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 2.00m (casing at 2.00m) rising to 1.80; 5 mins, 1.60m; 10 mins, 1.50; 15 mins & 1.45m; 20 mins, sealed off at 3.00m.
3. Gas/groundwater monitoring pipe (slotted from 1.00m to 10.00m) installed to the base of the borehole.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH8: Starter Pit Spoil Heap.

Borehole BH8: Close View of Spoil Heap.

Borehole BH8: Starter Pit Plan View.

Borehole BH8: Starter Pit Internal View.

BOREHOLE RECORD - BH9

Cable Percussion

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 10.41m	150mm to 3.50m	G19179

Logged by: NB	Ground Level: 41.724m AOD	Date: 19/03/20	Location: - 440132E, 332044N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10					Brown gravelly, sandy TOPSOIL (gravel is medium to coarse angular to rounded flint and quartz).		
B2	0.30 - 0.50			41.49	0.23	Orangish brown clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
B3	0.90 - 1.10			40.82	0.90	Medium dense orangish brown locally yellow slightly clayey fine to coarse SAND and fine to coarse angular to rounded flint, quartz and occasional sandstone GRAVEL.		
ES4	1.10 - 1.20							
C	1.20	N=11						
D5	1.50 - 1.60							
C	2.00	N=19		39.72	2.00	Medium dense orangish brown sandy, slightly clayey fine to coarse angular to sub-rounded flint, quartz and occasional sandstone GRAVEL.		
B6	2.00 - 2.50							
D7	2.50 - 2.60							
C	3.00	N=11		38.72	3.00	Medium dense orangish brown fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
B8	3.00 - 3.40							
D9	3.50 - 3.60			38.32	3.40	Firm greyish brown slightly gravelly, sandy CLAY/SILT gravel is fine to coarse angular to sub-rounded chalk, flint, siltstone and quartz).		
B10	3.60 - 4.00							
UT11	4.00 - 4.45	(90)				*... Becoming very stiff from 4.00m.*		
D12	4.50 - 4.60							
S	5.00	N=36		36.72	5.00	Very stiff reddish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded chalk, siltstone, flint, quartz and sandstone).		
D13	5.00 - 5.45							
D14	6.00 - 6.10			35.72	6.00	Very stiff greyish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded flint, chalk, siltstone and quartz).		
B15	6.10 - 6.50							
UT16	6.50 - 6.95	(90)		35.22	6.50	Very stiff greyish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded flint, chalk, sandstone and siltstone).		
D17	6.95 - 7.00							
S	8.00	50 for 230mm						
B19	8.00 - 8.50							
D18	8.00 - 8.38							
D20	9.00 - 9.10							
B22	9.50 - 10.00							
UT21	9.50 - 9.95	(90)						
D23	9.95 - 10.00							

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 3.00m (casing at 2.90m) rising to 2.90; 5 mins, 2.80m and rising to stand at 2.70m after 10 mins, sealed off at 3.50m.
3. On completion the borehole was backfilled with a mixture of bentonite pellets and spoil.

AGS

BOREHOLE RECORD - BH9

Cable Percussion

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 10.41m	150mm to 3.50m	G19179

Logged by: NB	Ground Level: 41.724m AOD	Date: 19/03/20	Location: - 440132E, 332044N	Scale: 1:50

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	SPT N						
S	10.00	50 for 260mm				Very stiff greyish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded flint, chalk, sandstone and siltstone).		
D24	10.00 - 10.41			31.31	10.41			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 3.00m (casing at 2.90m) rising to 2.90; 5 mins, 2.80m and rising to stand at 2.70m after 10 mins, sealed off at 3.50m.
3. On completion the borehole was backfilled with a mixture of bentonite pellets and spoil.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH9: Starter Pit Spoil Heap.

Borehole BH9: Close View of Spoil Heap.

Borehole BH9: Starter Pit Plan View.

Borehole BH9: Starter Pit Internal View.

BOREHOLE RECORD - BH10

Cable Percussion

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 15.45m	150mm to 4.00m	G19179

Logged by: NB	Ground Level: 41.994m AOD	Date: 20/03/20	Location: - 440055E, 332094N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10			41.79	0.20	Dark orangish brown gravelly, sandy TOPSOIL (gravel is fine to coarse angular to sub-rounded flint and quartz).		
B2	0.30 - 0.50					Orangish brown clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
B4	0.90 - 1.00							
ES3	0.90							
C	1.20	N=9				*... becoming loose from 1.20m.*		
				40.59	1.40			
D5	1.50 - 1.60					Loose brown, orangish brown locally pale grey and yellow very clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint, quartz and sandstone GRAVEL with many pockets of firm sandy gravelly clay.		
B6	1.60 - 2.00			40.39	1.60			
C	2.00	N=17				(Medium dense) orangish brown clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
				39.59	2.40			
D7	2.50 - 2.60					(Medium dense) orangish brown sandy, clayey fine to coarse angular to rounded flint andquartz GRAVEL.		
B8	2.60 - 3.00					*... Becoming slightly clayey sand and gravel from 2.60m.*		
C	3.00	N=15		38.99	3.00			
D9	3.00 - 3.40					Firm grey and brown slightly gravelly, slightly sandy CLAY (gravel is fineto coarse angular to sub-rounded flint, quartz, chalk, siltstone and sandstone).		
D10	3.40 - 3.50					*... Ceases to be clayey from 3.00m.*		
B11	3.50 - 4.00							
UT12	4.00 - 4.45	(80)		37.99	4.00	Very stiff greyish brown slightly gravelly CLAY (gravel is fine to coarse angular to sub-rounded flint, quartz, chalk, siltstone and sandstone)		
D13	4.45 - 4.50							
S	5.00	N=45						
B15	5.00 - 5.50							
D14	5.00 - 5.45							
D16	6.00 - 6.10							
UT17	6.50 - 6.95	(85)						
D18	6.95 - 7.00							
C	8.00	N=44						
D19	8.00 - 8.10							
D20	9.00 - 9.10							
B22	9.50 - 10.00							
UT21	9.50 - 9.95	(88)						
D23	9.95 - 10.00			31.99	10.00			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 3.00m (casing at 3.00m) rising to 2.90; 5 mins, 2.80m; 10 mins, 2.75; 15 mins & 2.70m; 20 mins, sealed off at 4.00m.
3. Gas/groundwater monitoring pipe (slotted from 1.00m to 15.00m) installed to the base of the borehole.

AGS

BOREHOLE RECORD - BH10

Cable Percussion

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Boring Diameter:	Casing Diameter:	Project No.:
Persimmon Homes.	150mm to 15.45m	150mm to 4.00m	G19179

Logged by: NB	Ground Level: 41.994m AOD	Date: 20/03/20	Location: - 440055E, 332094N	Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
C D24 B25	11.00 11.00 - 11.10 11.10 - 11.50	50 for 230mm				Very stiff grey and brown slightly gravelly CLAY with occasional pale brown silt partings (gravel is fine to medium angular to sub-rounded flint, quartz, siltstone and sandstone).		
D26	12.00 - 12.10							
UT27	12.50 - 12.95	(100)						
D28 D29	12.90 13.00 - 13.10			29.09	12.90	Very stiff greyish brown slightly gravelly, silty CLAY (gravel is fine to medium angular to sub-angular siltstone, sandstone, flint and mudstone).		
C B30	14.00 14.00 - 14.50	N=42						
C D31	15.00 15.00 - 15.10	N=43		26.89	15.10			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 3.00m (casing at 3.00m) rising to 2.90; 5 mins, 2.80m; 10 mins, 2.75; 15 mins & 2.70m; 20 mins, sealed off at 4.00m.
3. Gas/groundwater monitoring pipe (slotted from 1.00m to 15.00m) installed to the base of the borehole.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH10: Starter Pit Spoil Heap.

Borehole BH10: Close View of Spoil Heap.

Borehole BH10: Starter Pit Plan View.

Borehole BH10: Starter Pit Internal View.

APPENDIX C

Rotary Borehole Logs & Photographs

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	NH.01
Test Date:	23/05/2019
Report Date:	24/05/2019
File Name:	NH.01.spt
Test Operator:	TP

Instrumented Rod Data

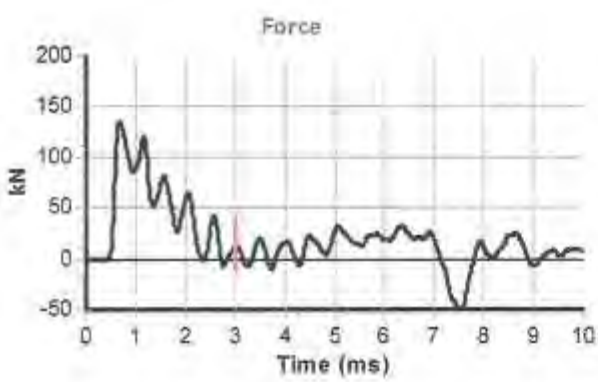
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	9603
Accelerometer No.2:	6457

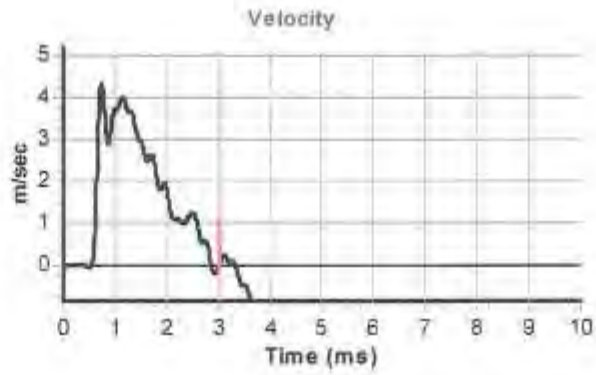
Hammer Information

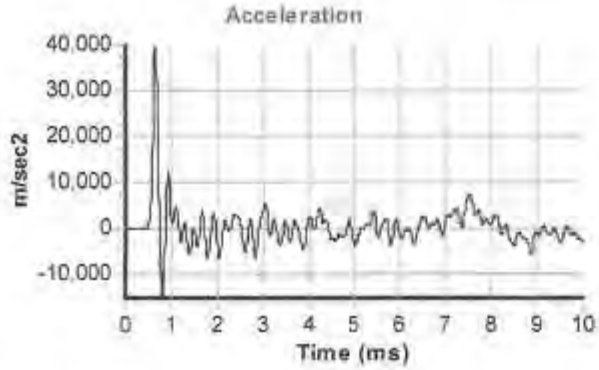
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

Comments / Location

Hammer tested at Dynamic samplings yard.







Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	358

Energy Ratio E_r (%): **76**

Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

BOREHOLE RECORD - BH1R

Rotary Core

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:
Persimmon Homes.

Boring Diameter:		Casing Diameter:		Project No.:
92mm	15.00m	110mm	11.50m	G19179

Logged by: NB | Ground Level: 41.165m AOD | Date: 25/03/20 | Location: - | Scale: 1:45

Sample Details Ref:	Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
							For strata recorded to 7.5m refer to the log for cable percussion borehole BH1.		
S D1	7.50 7.50	~~N=40~~			33.66	7.50	Very stiff very friable reddish brown and pale grey clayey SILT with occasional mudstone lithorelicts and thin bands of orangish brown silty fine to coarse SAND (sample description based upon the soils recovered within the SPT test at 7.50m). *… No sample recovery within core run from 7.50m to 9.00m; no loss of flush or sudden drop in the drilling rods observed.*		
CR	7.50 - 9.00	0 0 0							

Remarks and Water Observations

1. Borehole located 5m to the south of cable percussion borehole BH1.
2. Borehole advanced by open hole drilling techniques from ground level to 7.50m.
3. Groundwater seepages were encountered at 2.00m during drilling operations.
4. Borehole advanced by rotary coring from 7.5m to 9.0m, 12.5m to 13.5m and 13.5m to 15.0m and in between percussive drilling from 9.0m to 10.0m and 10.5 to 11.50m and open holing from 10.0m to 10.50m and 11.5m to 12.0m to advance the casing.
5. On completion the borehole was backfilled with bentonite pellets.

AGS

BOREHOLE RECORD - BH1R

Rotary Core

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client: Persimmon Homes.

Boring Diameter:		Casing Diameter:		Project No.:
92mm	15.00m	110mm	11.50m	G19179

Logged by: NB | Ground Level: 41.165m AOD | Date: 25/03/20 | Location: - | Scale: 1:45

Sample Details Ref:	Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
S	9.00	N=12			32.16	9.00	Medium dense dark reddish brown silty fine to coarse SAND.		
D2	9.00								
D3	9.00 - 9.30				31.86	9.30	Very stiff very friable reddish brown and pale grey sandy SILT.		
D4	9.30 - 10.00								
					31.16	10.00	Dense dark reddish brown silty fine to coarse SAND.		
S	10.50	N=23							
D5	10.50 - 10.95								
D6	10.50 - 10.80								
D7	10.83 - 11.00				30.34	10.83	Very stiff reddish brown locally pale grey slightly sandy, silty CLAY.		
D8	11.00 - 11.20				30.16	11.00	Very dense reddish brown locally pale grey locally clayey silty fine to coarse SAND.		
D9	11.20 - 11.50								
S	11.50	N=47			29.66	11.50	Very stiff very friable reddish brown and pale grey clayey SILT with occasional fine to medium gravel sized siltstone lithorelicts (no sample recovered from 11.5m to 12.74m; soil description based upon the soils recovered within the SPT test at 11.50m).		
D10	11.50 - 11.95								
					29.16	12.00			
		47							
CR	12.00 - 13.50	16			28.42	12.74	... although sample recovery was poor there was no loss of flush or sudden drop in the drilling rods observed.		
		12			28.30	12.86			
					28.16	13.00	Extremely weak reddish brown and pale grey sandy SILTSTONE.		
					27.98	13.19	Stiff very friable sandy, clayey SILT.		
C1	13.30 - 13.50				27.82	13.35	Very dense pale grey silty fine to coarse SAND		
S	13.50	~~50 for~~			27.66	13.50	Weak pale grey locally reddish brown sandy SILTSTONE, core section end joints are roughly horizontal, undulating and rough.		
D11	13.50 - 13.76	120mm					Weak pale grey fine to medium grained SANDSTONE.		
		29					Very stiff very friable reddish brown clayey SILT/extremely weak SILTSTONE with occasional thin veins of gypsum (no sample recovered from 13.5m to 14.57m; soil description based upon the soils recovered within the SPT test at 13.50m).		
CR	13.50 - 15.00	15							
		15							
					26.60	14.57	Very stiff friable reddish brown locally pale grey silty CLAY.		
C2	14.74 - 15.00				26.42	14.74	Weak reddish brown and pale grey fine to medium grained SANDSTONE; core section end joints are roughly horizontal, undulating and rough.		
S	15.00	~~50 for~~ 30mm			26.16	15.00			

Remarks and Water Observations

1. Borehole located 5m to the south of cable percussion borehole BH1.
2. Borehole advanced by open hole drilling techniques from ground level to 7.50m.
3. Groundwater seepages were encountered at 2.00m during drilling operations.
4. Borehole advanced by rotary coring from 7.5m to 9.0m, 12.5m to 13.5m and 13.5m to 15.0m and in between percussive drilling from 9.0m to 10.0m and 10.5 to 11.50m and open holing from 10.0m to 10.50m and 11.5m to 12.0m to advance the casing.
5. On completion the borehole was backfilled with bentonite pellets.

AGS

Borehole BH1R – Photographic Records

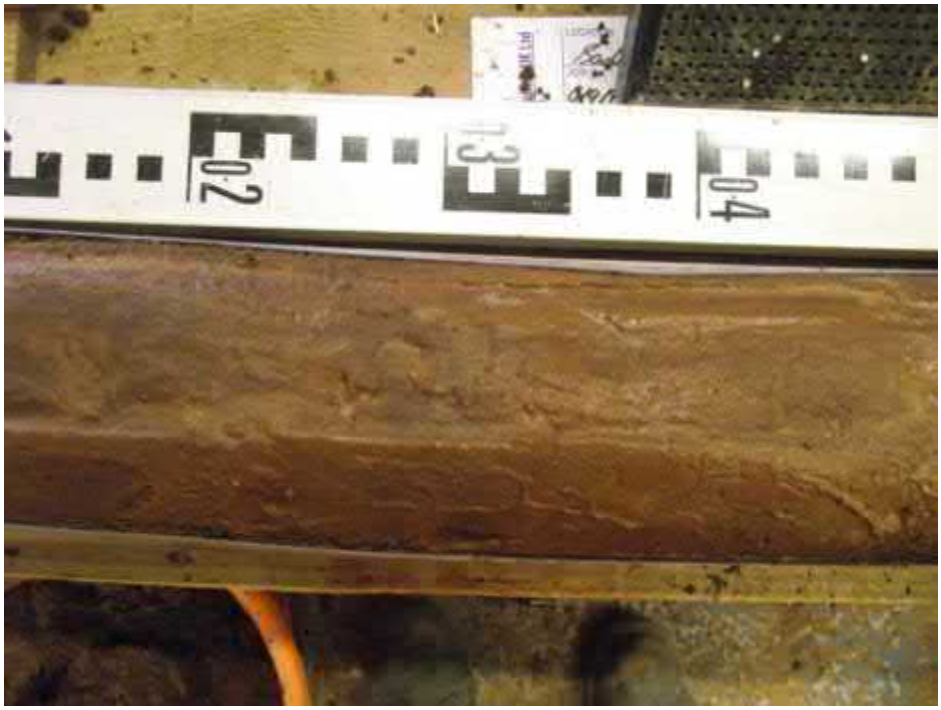
Windowless Sample Liner 9.00-10.00m.

Windowless Sample Liner 9.00-10.00m (Sand & Sandy silt).

Windowless Sample Liner 9.00-10.00m (Sandy silt).

Windowless Sample Liner 9.00-10.00m (Sandy silt).

Windowless Sample Liner 10.50-11.50m.



Windowless Sample Liner 10.50-11.50m (Silty sand).

Windowless Sample Liner 10.50-11.50m (Clayey Silty sand).

Windowless Sample Liner 10.50-11.50m

Core Run 2 - 12.00-13.50m

Core Run 2 - 12.00 - 13.50m (siltstone, sand & clayey silt).

Core Run 2 - 12.00 - 13.50m (Sandy clayey silt, sand & siltstone).

Core Run 2 - 12.00 - 13.50m (Sandy siltstone & Sandstone).

Core Run 3 – 13.50 – 15.00m.

Core Run 3 – 13.50 – 15.00m (Silty clay).

Core Run 3 – 13.50 – 15.00m (Sandstone).

BOREHOLE RECORD - BH2R

Rotary Core

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:
Persimmon Homes.

Boring Diameter:		Casing Diameter:		Project No.:
92mm	16.00m	110mm	11.50m	G19179

Logged by: NB | Ground Level: 41.762m AOD | Date: 18/03/20 - 19/03/20 | Location: - 440305E, 331776N | Scale: 1:45

Sample Details Ref:	Sample Details Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
							For strata recorded to 7.5m refer to the log for cable percussion borehole BH2.		
					34.26	7.50			
CR	7.50 - 9.00	0 0 0					No sample recovered within core run from 7.50m to 9.00m; no loss of flush or sudden drop in drilling rods observed.		

Remarks and Water Observations

1. Borehole located 5m to the south of cable percussion borehole BH2.
2. Borehole advanced by open hole drilling techniques from ground level to 7.50m.
3. Groundwater seepages were encountered at 3.45m during drilling operations.
4. Borehole advanced by rotary coring from 7.0m to 7.5m, 7.5m to 9.0m , 11.5m to 13.0m, 13.0m to 14.5m and 14.5m to 16.0m and in between percussive drilling from 9.0m to 10.0m and 10.5 to 11.50m.
5. On completion the borehole was backfilled with bentonite pellets.

AGS

BOREHOLE RECORD - BH2R

Rotary Core

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client: Persimmon Homes.

Boring Diameter:		Casing Diameter:		Project No.:
92mm	16.00m	110mm	11.50m	G19179

Logged by: NB | Ground Level: 41.762m AOD | Date: 18/03/20 - 19/03/20 | Location: - 440305E, 331776N | Scale: 1:45

Sample Details Ref:	Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
S	9.00	N=21			32.76	9.00	Thinly banded stiff very friable reddish brown and pale grey sandy SILT and grey weakly cemented silty fine to coarse SAND.		
D1	9.00 - 9.45								
D2	9.00 - 9.40								
D3	9.40 - 9.80				32.36	9.40	Pale grey very silty fine to medium SAND.		
D4	9.80 - 10.00				31.96	9.80	Banded firm to stiff very friable reddish brown locally pale grey sandy SILT and pale grey very silty fine to coarse SAND.		
S	10.50	N=12			31.26	10.50	Extremely weak grey CONGLOMERATE recovered as fine to coarse sand with occasional coarse gravel sized sub-rounded pebbles.		
D5	10.50				31.06	10.70	Very stiff very friable reddish brown sandy SILT.		
D6	10.50 - 10.70								
D7	10.70 - 10.90				30.86	10.90	Reddish brown locally grey very silty fine to coarse SAND.		
D8	11.00 - 11.50								
S	11.50	50 for 150mm			30.26	11.50	Banded very friable reddish brown and pale grey sandy SILT and weakly cemented very silty fine to coarse SAND with occasional siltstone lithorelicts.		
D9	11.50 - 11.95								
CR	11.50 - 13.00	30 0 0							
					29.21	12.55	Very stiff very friable reddish brown sandy, clayey SILT with occasional fine to medium gravel sized siltstone and mudstone lithorelicts.		
C1	12.75 - 12.84				29.01	12.75	Extremely weak reddish brown sandy, silty MUDSTONE,		
S	13.00	50 for 80mm			28.68	13.08	Very stiff friable reddish brown locally pale grey silty CLAY.		
D10	13.00 - 13.27				28.60	13.16	Weak reddish brown and pale grey close to medium bedded sandy SILTSTONE, bedding joints are roughly horizontal, undulating and rough.		
C2	13.20 - 13.49								
C3	13.50 - 13.59								
CR	13.00 - 14.50	100 43 29			28.09	13.67	Weak pale grey locally reddish brown fine to medium grained SANDSTONE, core section end joints are roughly horizontal, undulating and rough.		
					27.86	13.90	Reddish brown and pale grey sandy, clayey SILT with occasional fine to medium gravel sized siltstone lithorelicts.		
					27.74	14.02	Extremely weak reddish brown silty MUDSTONE, core section end joints are roughly horizontal, undulating and fairly smooth.		
					27.63	14.13	Very stiff very friable reddish brown slightly sandy, clayey SILT with many fine gravel sized mudstone lithorelicts.		
C4	14.35 - 14.50				27.54	14.22	Weak reddish brown and pale brown sandy SILTSTONE.		
S	14.50	50 for 120mm			27.16	14.60	Very stiff very friable reddish brown locally pale grey sandy, clayey SILT.		
C5	14.85 - 15.05				26.94	14.82	Extremely weak reddish brown sandy SILTSTONE.		
C6	15.15 - 15.40	100 83 64			26.74	15.02	Weak pale grey very close to medium bedded fine to medium grained SANDSTONE, bedding joints are roughly horizontal, undulating and rough.		
CR	14.50 - 16.00								
C7	15.40 - 15.67								
C8	15.80 - 15.94								
					25.76	16.00			

Remarks and Water Observations

1. Borehole located 5m to the south of cable percussion borehole BH2.
2. Borehole advanced by open hole drilling techniques from ground level to 7.50m.
3. Groundwater seepages were encountered at 3.45m during drilling operations.
4. Borehole advanced by rotary coring from 7.0m to 7.5m, 7.5m to 9.0m , 11.5m to 13.0m, 13.0m to 14.5m and 14.5m to 16.0m and in between percussive drilling from 9.0m to 10.0m and 10.5 to 11.50m.
5. On completion the borehole was backfilled with bentonite pellets.

AGS

Borehole BH2R – Photographic Records

Windowless Sample Liner 9.00-10.00m.

Windowless Sample Liner 9.00-10.00m (Silty sand & Sandy silt).

Windowless Sample Liner 9.00-10.00m (Silty sand & Sandy silt).
Note: Windowless Sample Liner 10.50m-11.50m (Liner shredded soil placed into sample bag).

Core Run 2 - 11.50-13.00m.

Core Run 2 - 11.50-13.00m (Silty sandy Mudstone).

Core Run 2 - 11.50-13.00m.

Core Run 3 – 13.00-14.50m

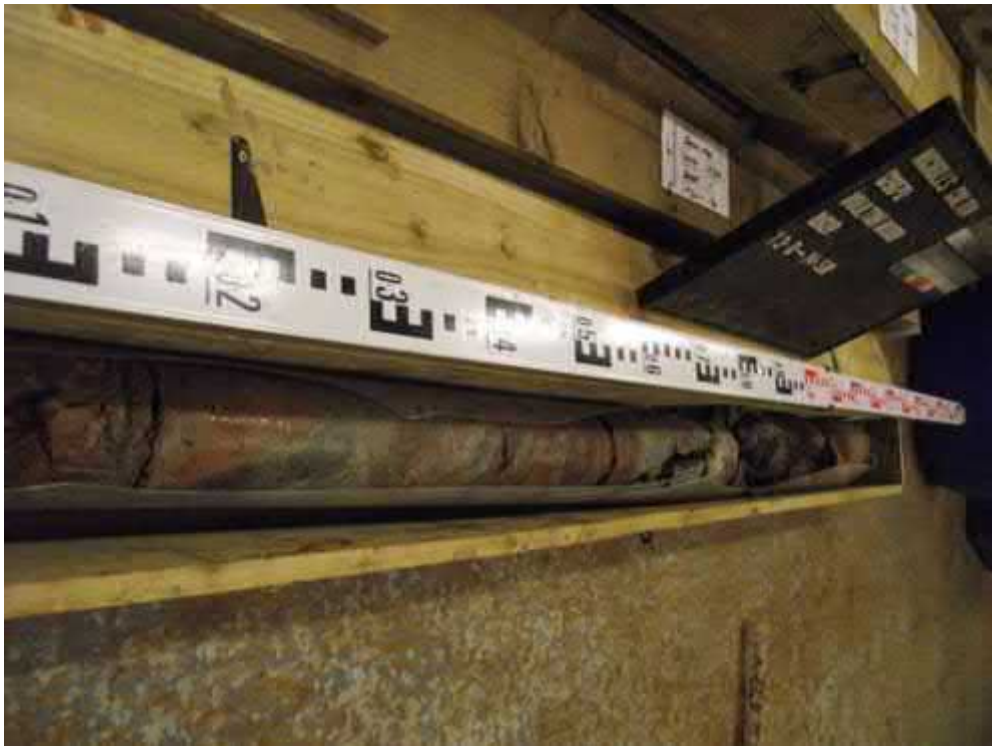
Core Run 3 - 13.00-14.50m (Sandy Siltstone).

Core Run 3 - 13.00-14.50m (Sandy siltstone & Sandstone).

Core Run 3 - 13.00-14.50m (Sandstone & Clayey silt).

Core Run 3 - 13.00-14.50m (Clayey silt & Mudstone).

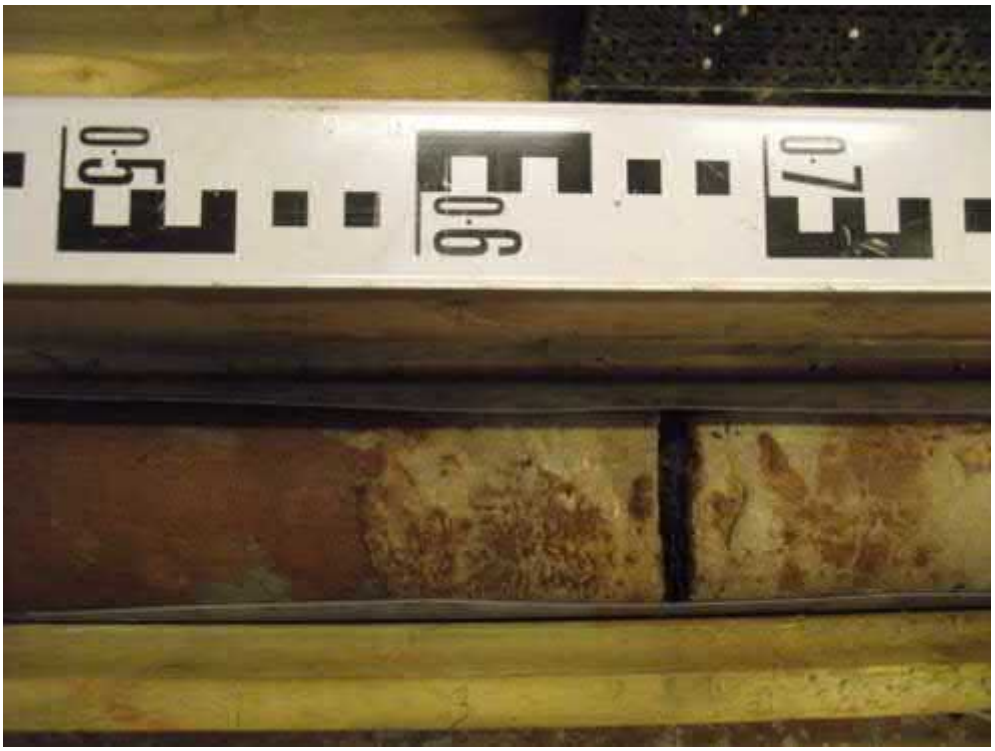
Core Run 3 - 13.00-14.50m (Sandy siltstone).



Core Run 3 - 13.00-14.50m.

Core Run 4 – 14.50 – 16.00m.

Core Run 4 – 14.50 – 16.00m (Sandy clayey silt & sandy Siltstone).



Core Run 4 – 14.50 – 16.00m (Sandy siltstone & Sandstone).

Core Run 4 – 14.50 – 16.00m (Sandstone).

Core Run 4 – 14.50 – 16.00m (Sandstone).

Core Run 4 – 14.50 – 16.00m (Sandstone).

BOREHOLE RECORD - BH4

Rotary Core

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client: Persimmon Homes.

Boring Diameter:		Casing Diameter:		Project No.:
120mm	10.18m	110mm	9.00m	G19179

Logged by: NB | Ground Level: 40.667m AOD | Date: 19/03/20 - 20/03/20 | Location: - 440293E, 331856N | Scale: 1:55

Sample Details Ref:	Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10 - 0.20				40.47	0.20	MADE GROUND - Turf over brown gravelly, slightly sandy, clayey TOPSOIL (gravel is fine to coarse angular to rounded flint and quartz).		
B2	0.40 - 0.60						MADE GROUND - Brown very clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
ES3	0.60								
					39.87	0.80	MADE GROUND - Brown buried TOPSOIL.		
D5	1.00 - 1.10				39.67	1.00	MADE GROUND - Soft and Firm orangish brown and grey slightly gravelly to gravelly, slightly sandy CLAY with occasional pockets of very clayey sand and gravel and traces of organic matter (gravel is fine to coarse angular to sub-rounded flint and quartz).		
S	1.20	N=10							
B7	1.20 - 2.00								
D6	1.20 - 1.65								
S	2.00	N=27			38.67	2.00	MADE GROUND - Medium dense grey and brown fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL with occasional brick fragments.		
D8	2.00 - 2.45								
D9	2.00 - 2.30				38.37	2.30			
B10	2.30 - 2.70								
D11	2.70 - 3.00				37.97	2.70	Medium dense orangish brown very sandy, slightly silty, slightly clayey fine to coarse angular to rounded flint and quartz GRAVEL.		
S	3.00	N=26					Stiff very friable reddish brown locally pale grey sandy, slightly clayey sandy SILT locally silty fine to coarse SAND with occasional sub-angular coarse gravel sized siltstone inclusions.		
D12	3.00 - 3.45								
D13	3.00 - 3.40				37.27	3.40			
D14	3.70 - 4.00						Stiff very friable reddish/orangish brown and pale grey sandy, clayey SILT with many fine gravel sized mudstone lithorelicts.		
S	4.00	N=38					*... Rotary core run undertaken from 4.00m to 5.00m but with no sample recovered; no loss of flush or sudden displacement of the rods recorded.*		
D14B	4.00 - 4.45								
S	5.00	N=20							
D15	5.00 - 5.45				35.47	5.20	Very stiff, very friable reddish brown locally pale grey sandy, slightly clayey SILT.		
D16	5.00 - 5.20								
D17	5.70 - 6.00								
S	6.00	N=31					*... Rotary core run undertaken from 6.00m to 7.00m but with no sample recovered; no loss of flush or sudden displacement of the rods recorded.*		
D18	6.00 - 6.45								
S	7.00	N=42							
B4	7.00								
D19	7.00 - 7.45								
D20	7.00 - 8.00				33.17	7.50	Extremely weak orangish brown CONGLOMERATE; recovered as fine to coarse SAND with occasional coarse gravel sized sub-rounded to rounded pebbles.		
S	8.00	N=25							
D21	8.00 - 8.45				32.57	8.10	Very stiff, very friable reddish brown locally pale grey sandy SILT.		
D22	8.10 - 8.60								
D23	8.60 - 9.00								
S	9.00	~~N=29~~							
D24	9.00 - 9.45								
		66							
CR	9.00 - 10.00	11			31.22	9.45	Extremely weak orangish brown CONGLOMERATE; recovered as fine to coarse SAND with occasional coarse gravel sized sub-rounded to rounded pebbles.		
		0			31.07	9.60			
S	10.00	~~50 for~~					Extremely weak to weak reddish brown and pale grey very close to close bedded fine to medium grained SANDSTONE, bedding joints are roughly horizontal, undulating and rough.		
D25	10.00 - 10.18	60mm			30.48	10.19			

Remarks and Water Observations

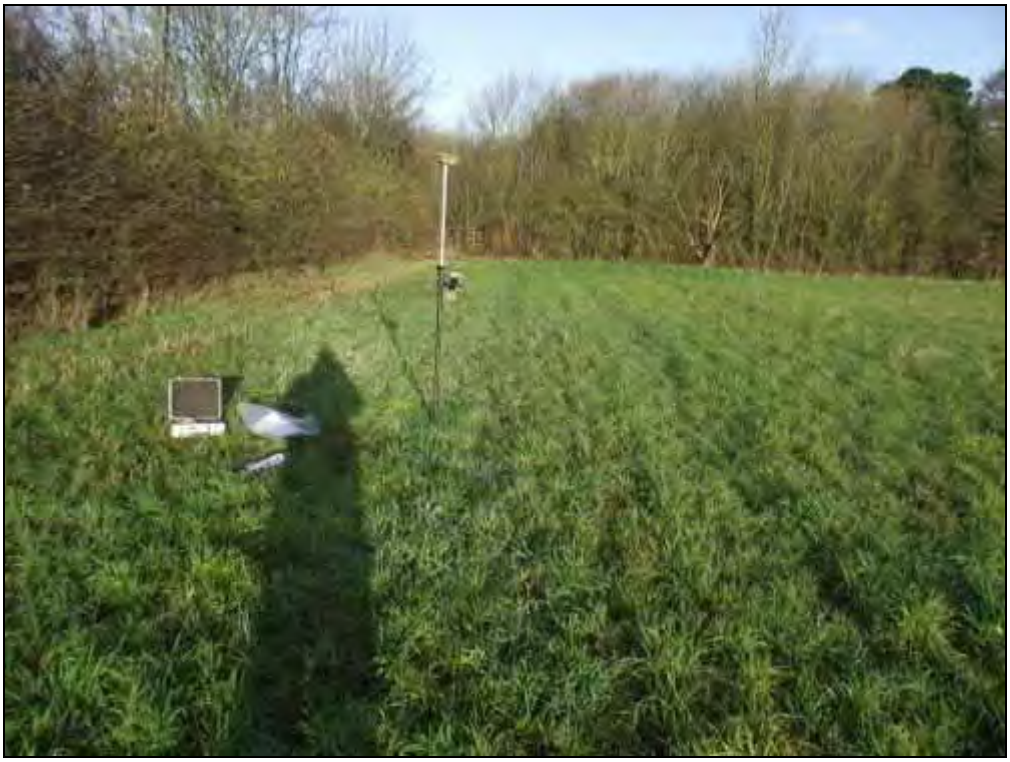
1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Following hand dug pit borehole formed using a Commachio 205 rig in percussion mode to 4.00m, rotary coring from 4-5m, percussion from 5-6m, rotary coring 6-8m, percussion 8-9m and finally rotary coring from 9-10m.
3. Groundwater seepages were encountered at 2.00m rising to 1.20 after 20 mins, not sealed off.
4. Groundwater standing within borehole at 1.25m at commencement of day 2 shift and at 3.60m on completion of drilling.
5. Gas/groundwater monitoring pipe (slotted from 1.00m to 10.00m) installed to the base of the borehole.

AGS

CABLE PERCUSSION BOREHOLE PHOTOGRAPHS

Borehole BH4: Prior to Rigging up.

Borehole BH4: Prior to Rigging up Looking North.



Borehole BH4: Prior to Rigging up Looking South.

Borehole BH4: Starter Pit Spoil Heap.

Borehole BH4: Close View of Spoil Heap.

Borehole BH4: Starter Pit Plan View.

Borehole BH4: Starter Pit Internal View.

Borehole BH4 – Photographic Records

Core Run 4 - 9.00-10.00m.

Core Run 4 - 9.00-10.00m (Conglomerate – recovered as pebbles with sand having washed away).

Core Run 4 - 9.00-10.00m (Sandstone).

Core Run 4 - 9.00-10.00m (Sandstone).

Core Run 4 - 9.00-10.00m.

BOREHOLE RECORD - BH7R

Cable Percussion with Rotary Core

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client: Persimmon Homes.

Boring Diameter:		Casing Diameter:	
150mm	6.50m	150mm	3.00m
92mm	15.00m	110mm	12.00m

Project No.: G19179

Logged by: NB | Ground Level: 40.088m AOD | Date: 17/03/20 - 24/03/20 | Location: - 440207E, 331913N | Scale: 1:50

Samples and In situ Tests Ref:	Depth (m)	SPT N	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
ES1	0.10					Brown TOPSOIL.		
B2	0.30 - 0.50			39.79	0.30	Orangish brown very silty, slightly clayey fine to coarse SAND and fine to coarse angular to sub-rounded flint and quartz GRAVEL.		
ES3	0.70							
B4	1.00 - 1.20							
C	1.20	N=9				*... Loose at 1.20m.*		
D5	1.50 - 1.60							
B6	1.60 - 2.00			38.49	1.60	Firm orangish brown slightly gravelly, slightly sandy CLAY (gravel is fine to coarse angular to sub-rounded flint, quartz and sandstone.		
UT7	2.00 - 2.50	(40)				*... becoming firm to stiff from 2.00m.*		
D8	2.45 - 2.50			37.59	2.50	Very stiff very friable dark reddish brown SILT with many fine gravel sized mudstone litorelicts.		
S	3.00	N=28		37.09	3.00	Very stiff very friable pale grey locally redish brown sandy, clayey SILT banded with silty SAND and occasional thin bands of extremely weak siltstone.		
D9	3.00 - 3.45							
S	4.00	N=36		36.09	4.00	Very stiff very friable dark reddish brown and pale grey clayey SILT/silty CLAY with occasional fine to medium gravel sized angular mudstone and siltstone lithorelicts.		
B10	4.00 - 4.20							
D11	4.00 - 4.45							
UT11	5.00 - 5.20	(100)				*... UT sample attempted at 5.00m but failed as sample tube damaged on hard strata.*		
S	5.20	N=39		34.89	5.20	Very stiff very friable reddish brown and pale grey silty, slightly clayey to very silty fine to medium SAND interbanded with very clayey sandy SILT.		
D12	5.20 - 5.65							
S	6.50	50 for 230mm		33.59	6.50	Stiff very friable reddish brown and pale grey sandy, very clayey SILT with occasional siltstone lithorelicts and thin bands (up to 50mm) of extremely weak silty fine to medium grained SANDSTONE grading to silty sand.		
D13	6.50 - 6.88							
D14	6.50 - 7.50							
S	7.50	~~N=30~~						
D15	7.50							
CR	7.50 - 9.00	57 0 0		31.89	8.20	Pale grey silty SAND (probably extremely weak weathered sandstone in situ).		
				31.74	8.35	Very stiff friable reddish brown locally pale grey very silty CLAY.		
				31.59	8.50	Very stiff very friable reddish brown locally pale grey sandy, clayey SILT.		
				31.32	8.77	Weak pale grey very close to close bedded fine to medium grained SANDSTONE, bedding joints are undulating and rough.		
D16	9.00 - 9.60			31.09	9.00	Extremely weak dark orangish brown CONGLOMERATE; recovered as fine to coarse SAND with occasional coarse gravel sized sub-rounded pebbles.		
D17	9.60 - 9.90			30.49	9.60	Very stiff very friable reddish brown and pale gey sandy CLAY with occasional coarse gravel sized sub-rounded quartz pebbles.		
				30.19	9.90			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 4.00m (casing at 2.50m) rising to 3.70; 5 mins, 3.50m; 10 mins, 3.30; 15 mins & 3.00m; 20 mins, not sealed off.
3. Cable percussion drilling terminated at 6.50m; borehole continued with Commachio 205 rig in varying percussive and rotary coring modes, groundwater standing in borehole at 1.00m prior to commencement of drilling.
4. On completion the borehole was backfilled with bentonite pellets.

BOREHOLE RECORD - BH7R

Cable Percussion with Rotary Core

NICHOLLS COLTON GROUP

Site: Boulton Moor, Derby.

Client: Persimmon Homes.

Boring Diameter:		Casing Diameter:	
150mm	6.50m	150mm	3.00m
92mm	15.00m	110mm	12.00m

Project No.: G19179

Logged by: NB | Ground Level: 40.088m AOD | Date: 17/03/20 - 24/03/20 | Location: - 440207E, 331913N | Scale: 1:50

Sample Details Ref:	Sample Details Depth (m)	TCR SCR RQD	FI FS	Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
D18	10.00 - 10.45						Very stiff very friable reddish brown and pale grey very silty CLAY. *... No sample recovered from 10.00m to 11.00m but no loss of flush or drop in drilling rods observed.*		
S	10.50	~~50 for~~ 220mm							
		67			29.09	11.00			
CR	10.50 - 12.00	28					Extremely weak reddish brown and pale grey sandy SILTSTONE (considerd to be fractured by drilling action).		
C1	11.38 - 11.48	18			28.71	11.38			
C2	11.53 - 11.70						Weak reddish brown and pale grey close bedded silty MUDSTONE, bedding joints are undulating and slightly rough faced. *... Thin gypsum vein (7mmn) present at 11.82m.*		
C3	11.70 - 11.85								
S	12.00	~~50 for~~ 160mm			28.09	12.00			
D19	12.00 - 12.45						Very stiff very friable reddish brown locally pale grey sandy, slightly clayey SILT with occasional fine gravel sized mudstone and siltstone lithorelicts.		
					27.70	12.39			
		82					Extremely weak reddish brown locally pale grey very close to close bedded silty MUDSTONE including many thin veins (2-20mm) of gypsum, bedding joints are roughly horizontal, undulating and slightly rough faced.		
CR	12.00 - 13.50	47							
		33							
S	13.50	~~50 for~~ 85mm							
					26.35	13.74			
C4	13.95 - 14.15						Weak reddish brown and pale grey close to medium bedded silty MUDSTONE, bedding joints are roughly horizontal, undulating both smooth and slightly rough faced with variance in grain size. Very thin gypsum veins (1mm & 3mm) located at 13.86 and 13.90m and thicker veins (2-23mm) located between 14.70 and 15.00m.		
C5	14.20 - 14.37	84							
CR	13.50 - 15.00	64							
C6	14.37 - 14.54	61							
C7	14.54 - 14.69								
C8	14.70 - 14.84								
C9	14.90 - 15.00								
					24.95	15.14			

Remarks and Water Observations

1. Hand dug starter pit to 1.20m to check for any unmapped underground services.
2. Groundwater seepages were encountered at 4.00m (casing at 2.50m) rising to 3.70; 5 mins, 3.50m; 10 mins, 3.30; 15 mins & 3.00m; 20 mins, not sealed off.
3. Cable percussion drilling terminated at 6.50m; borehole continued with Commachio 205 rig in varying percussive and rotary coring modes, groundwater standing in borehole at 1.00m prior to commencement of drilling.
4. On completion the borehole was backfilled with bentonite pellets.

AGS

Borehole BH7R – Photographic Records

Core Run 2 – 7.50-9.00m.

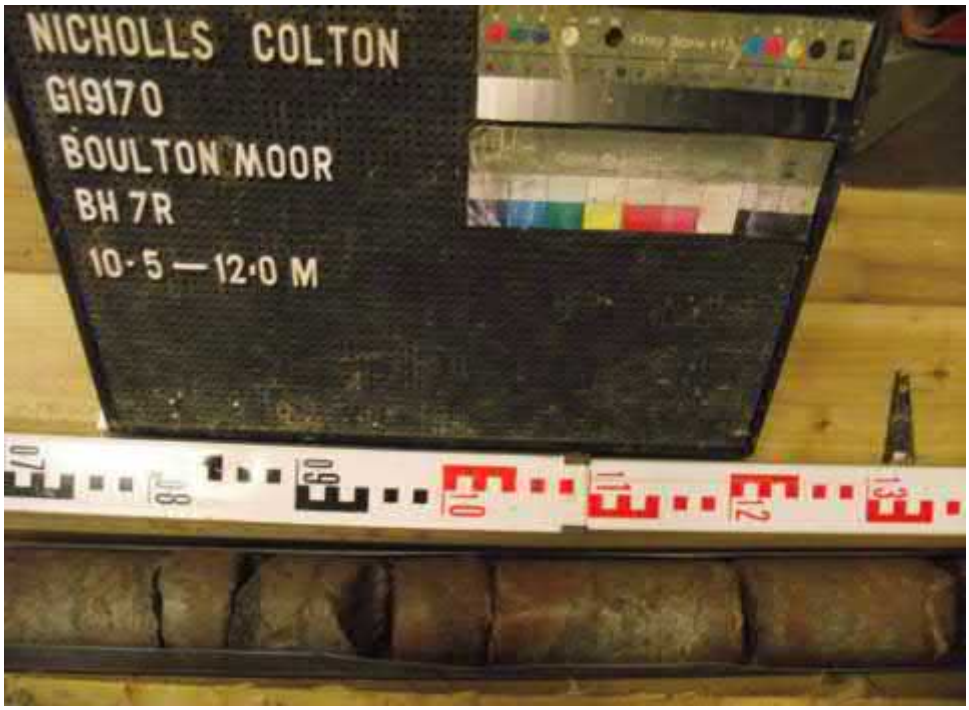
Core Run 2 – 7.50-9.00m (Clayey silt).

Core Run 2 – 7.50-9.00m (Sandstone).

Core Run 2 – 7.50-9.00m

Note: 9.00m to 10.00m sampled in windowless sample liner which shredded and logged on site

Core Run 3 – 10.50-12.00m



Core Run 3 – 10.50-12.00m (Siltstone & Mudstone).

Core Run 3 – 10.50-12.00m (Mudstone).

Core Run 3 – 10.50-12.00m (Mudstone including Gypsum vein).

Core Run 3 – 10.50-12.00m.

Core Run 4 - 12.00 - 13.50m.

Core Run 4 - 12.00 - 13.50m (Mudstone including Gypsum veins).

Core Run 4 - 12.00 - 13.50m (Mudstone including Gypsum veins).

Core Run 4 - 12.00 - 13.50m (Mudstone including Gypsum band and veins).

Core Run 4 - 12.00 - 13.50m (Mudstone including Gypsum band and veins).

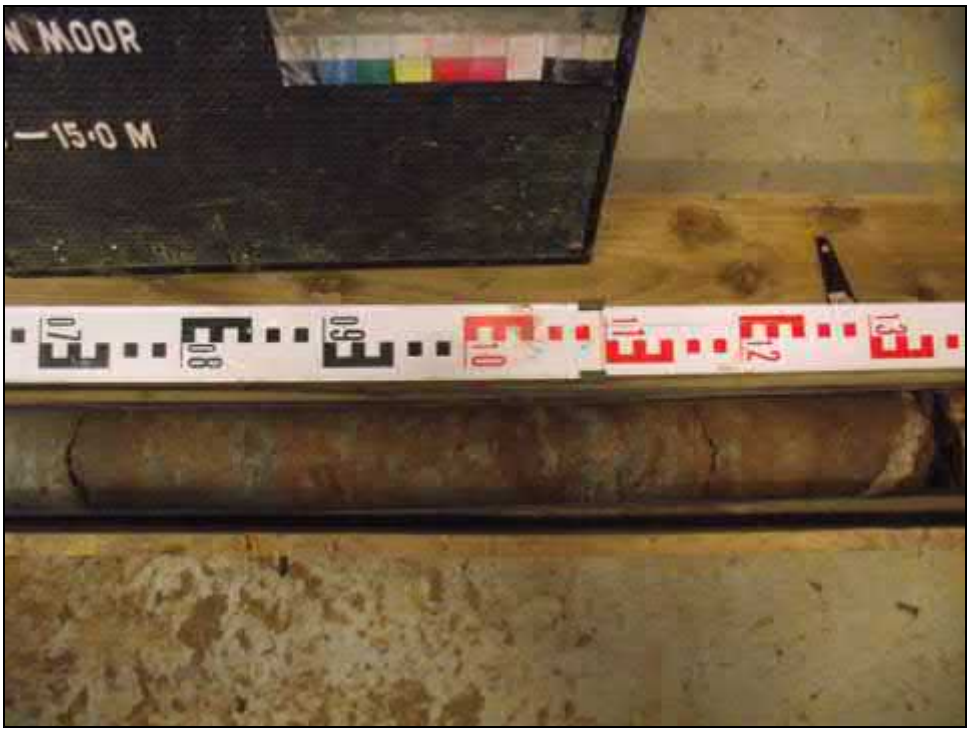
Core Run 4 - 12.00 - 13.50m (Mudstone including Gypsum band.

Core Run 5 – 13.50 – 15.00m.

Core Run 5 – 13.50 – 15.00 (Mudstone with Gypsum vein) .

Core Run 5 – 13.50 – 15.00 (Mudstone).

Core Run 5 – 13.50 – 15.00 (Mudstone & Gypsum bands/veins).



Core Run 5 – 13.50 – 15.00 (Mudstone & Gypsum bands/veins).

APPENDIX D

Trial Trench Logs & Photographs

SYMBOLS USED IN

TRIAL PIT LOGS

SAMPLES

G	-	Environmental sample, Amber Glass jar of disturbed soil for contamination testing
J	-	Environmental sample, Plastic Jar samples of disturbed soil for contamination testing
V	-	Environmental sample, small glass Vial samples of disturbed soil for contamination testing
E	-	Environmental sample, consisting of a G, J & V sample (1 of each)
B	-	large (bulk) sample of disturbed soil from trial pit
D	-	small disturbed sample of soil from trial pit
W	-	sample of groundwater from trial pit

TESTS

HSV	-	Hand Shear Vane (the resultant number being an average of several readings and stated in kN/m^2 or kPa)
CBR	-	California Bearing Ratio (test carried out in situ the result being a percentage)

GROUNDWATER

▽ - Water strike

▼ - Water level

The information concerning groundwater noted on the trial pit logs has been obtained (unless otherwise stated) only during the period of the excavation of the trial pit.

To obtain complete data on groundwater conditions at any site (including fluctuations in level), observations and readings in properly constructed standpipes or piezometers are required over a period of several months. Information noted on the logs for this site therefore may be incomplete. In particular, groundwater levels either higher or lower than those found during this investigation may occur, and in some cases where no groundwater was encountered, this may be a temporary condition.

TRIAL PIT LOG - TT1

NICHOLLS COLTON GROUP

Site:
Boulton Moor, Derby.

Client:	Method of Excavation:	Dimensions:	Project No.:
Persimmon Homes.	Mechanical Excavator	8.00m x 0.60m	G19179

Logged by: NB	Ground Level: 41.611m AOD	Date: 11/12/2019	Location: - 440281E, 331486N	Scale: 1:25

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.10					Brown slightly gravelly, silty, fine to medium humic SAND with many roots (gravel is medium to coarse sub-angular to sub-rounded quartz).		
				41.36	0.25			
B2	0.40 - 0.80					Orangish brown gravelly, silty, locally clayey fine to medium SAND (gravel is medium to coarse sub-angular to sub-rounded quartz)		
B3	0.80 - 1.00			40.81	0.80	Orangish and reddish brown slightly clayey fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
						...with occasional sub-rounded quartz cobbles from 1.50m.		
				40.01	1.60	Orangish brown fine to coarse SAND and fine to coarse angular to rounded flint and quartz GRAVEL.		
B4	1.80							
				39.41	2.20	Soft reddish brown locally pale grey silty CLAY.		
D5	2.50							
				38.81	2.80	Stiff very friable reddish brown locally pale grey green clayey SILT with occasional thin bands of extremely weak siltstone.		
D6	3.30							
				38.11	3.50			

Remarks and Water Observations

1. Groundwater seepages were encountered at 1.05m.
2. The trial trench walls initially partially collapsed from 1.50m and totally collapsed from ground level once the excavation had reached the target depth of 3.50m.
3. The trial trench was backfilled with the accumulated spoil.

AGS

TRIAL PIT PHOTOGRAPHS

Trial Trench TT1: Prior to Excavation Looking West.

Trial Pit TT1: Prior to Excavation Looking East.

Trial Pit TT1: Spoil Heap.

Trial Pit TT1: South Eastern Section of Trial Trench Prior to Collapse of Walls.

Trial Trench TT1: North Western End of Trial Trench (Walls Collapsed Before Photo Could be Taken).

Trial Trench TT1: Full Extent of Trial Trench Subsequent to Collapse of the Walls.

Trial Trench TT1: Following Backfilling.

TRIAL PIT LOG - TT2

Site:
Boulton Moor, Derby.

Client:	Method of Excavation:	Dimensions:	Project No.:
Persimmon Homes.	Mechanical Excavator	8.00m x 0.60m	G19179

Logged by: NB	Ground Level: 41.383m AOD	Date: 11/12/2019	Location: - 440297E, 331500N	Scale: 1:25

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.10			41.18	0.20	Brown gravelly, silty fine to medium humic SAND (gravel is medium to coarse sub-angular to sub-rounded quartz).		
D2	0.50					Soft orangish brown slightly gravelly, sandy, silty CLAY (gravel is medium to coarse sub-angular to sub-rounded quartz).		
B3	0.80 - 1.00			40.63	0.75	Orangish brown sandy, clayey fine to coarse angular to rounded flint and quartz GRAVEL with occasional sub-rounded to rounded cobbles.		
D4	2.00			39.58	1.80	Soft reddish brown sandy, slightly clayey SILT with pockets of silty fine to coarse sand.		
D5	2.30			39.18	2.20	Firm reddish brown locally pale grey silty CLAY.		
				38.88	2.50			

Remarks and Water Observations

1. Groundwater seepages were encountered at 0.80m.
2. The trial trench walls collapsed from ground level once the excavation had reached a depth of 2.50m.
3. The trial trench was backfilled with the accumulated spoil.

TRIAL PIT PHOTOGRAPHS

Trial Trench TT2: Prior to Excavation Looking North.

Trial Pit TP2: Prior to Excavation Looking South.

Trial Pit TT2: Spoil Heap.

Trial Pit TT2: Spoil From North Western Section of Trench.

Trial Trench TT2: South Eastern End of Trial Trench.

Trial Trench TT2: South Eastern End of Trial Trench Photo 2.

Trial Trench TT2: South Eastern End of Trial Trench Close Up Note Groundwater Seepages.

Trial Trench TT2: North Western End of Trial Trench.

Trial Trench TT2: Full Extent of Trial Trench (Collapse of Walls Having Occurred).

Trial Trench TT2: Following Backfilling.

APPENDIX E

Dynamic Probe Test Results

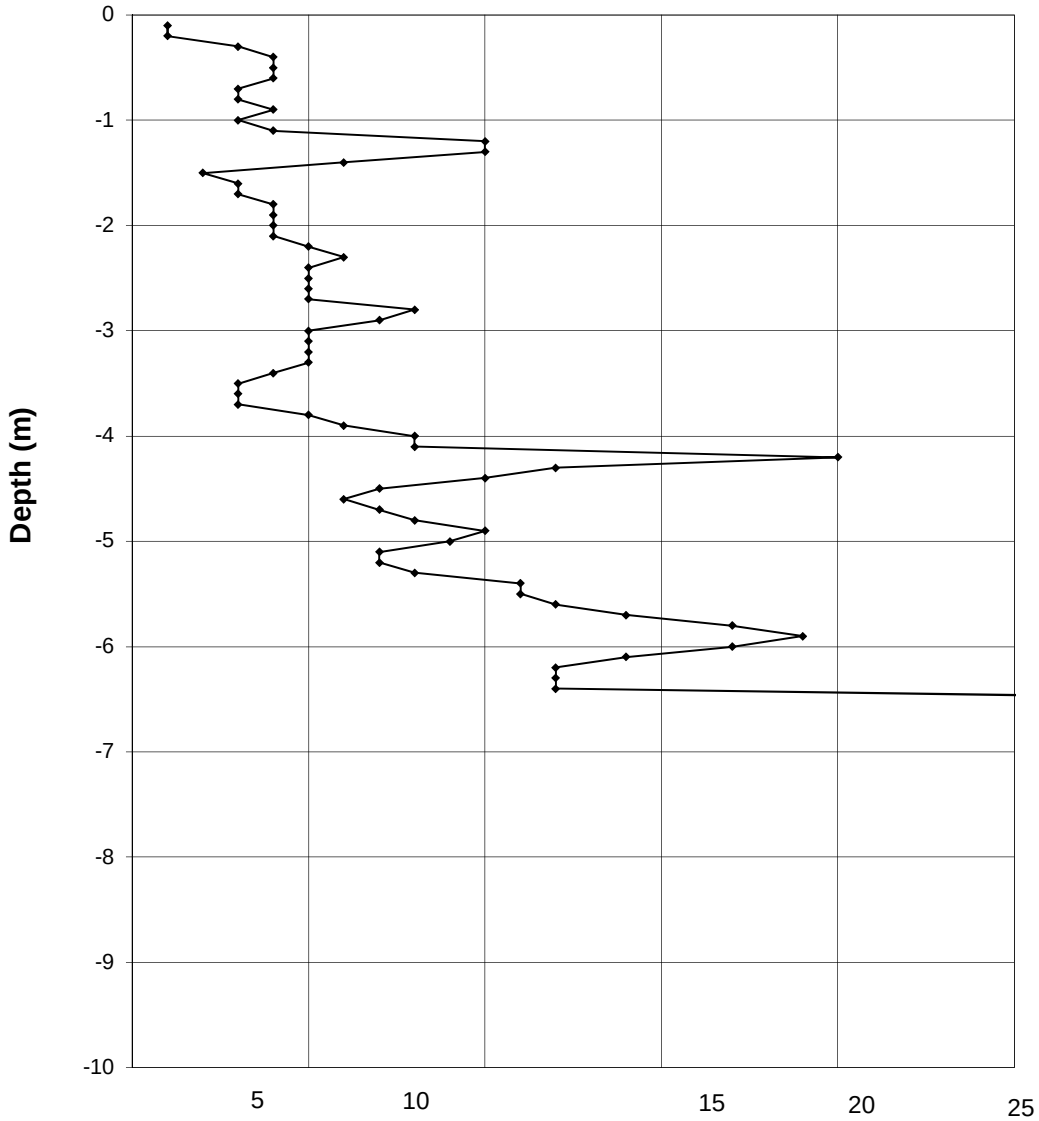
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP1

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	7
0.1 - 0.2	1	5.1 - 5.2	7
0.2 - 0.3	3	5.2 - 5.3	8
0.3 - 0.4	4	5.3 - 5.4	11
0.4 - 0.5	4	5.4 - 5.5	11
0.5 - 0.6	4	5.5 - 5.6	12
0.6 - 0.7	3	5.6 - 5.7	14
0.7 - 0.8	3	5.7 - 5.8	17
0.8 - 0.9	4	5.8 - 5.9	19
0.9 - 1.0	3	5.9 - 6.0	17
1.0 - 1.1	4	6.0 - 6.1	14
1.1 - 1.2	10	6.1 - 6.2	12
1.2 - 1.3	10	6.2 - 6.3	12
1.3 - 1.4	6	6.3 - 6.4	12
1.4 - 1.5	2	6.4 - 6.5	33
1.5 - 1.6	3	6.5 - 6.6	
1.6 - 1.7	3	6.6 - 6.7	
1.7 - 1.8	4	6.7 - 6.8	
1.8 - 1.9	4	6.8 - 6.9	
1.9 - 2.0	4	6.9 - 7.0	
2.0 - 2.1	4	7.0 - 7.1	
2.1 - 2.2	5	7.1 - 7.2	
2.2 - 2.3	6	7.2 - 7.3	
2.3 - 2.4	5	7.3 - 7.4	
2.4 - 2.5	5	7.4 - 7.5	
2.5 - 2.6	5	7.5 - 7.6	
2.6 - 2.7	5	7.6 - 7.7	
2.7 - 2.8	8	7.7 - 7.8	
2.8 - 2.9	7	7.8 - 7.9	
2.9 - 3.0	5	7.9 - 8.0	
3.0 - 3.1	5	8.0 - 8.1	
3.1 - 3.2	5	8.1 - 8.2	
3.2 - 3.3	5	8.2 - 8.3	
3.3 - 3.4	4	8.3 - 8.4	
3.4 - 3.5	3	8.4 - 8.5	
3.5 - 3.6	3	8.5 - 8.6	
3.6 - 3.7	3	8.6 - 8.7	
3.7 - 3.8	5	8.7 - 8.8	
3.8 - 3.9	6	8.8 - 8.9	
3.9 - 4.0	8	8.9 - 9.0	
4.0 - 4.1	8	9.0 - 9.1	
4.1 - 4.2	20	9.1 - 9.2	
4.2 - 4.3	12	9.2 - 9.3	
4.3 - 4.4	10	9.3 - 9.4	
4.4 - 4.5	7	9.4 - 9.5	
4.5 - 4.6	6	9.5 - 9.6	
4.6 - 4.7	7	9.6 - 9.7	
4.7 - 4.8	8	9.7 - 9.8	
4.8 - 4.9	10	9.8 - 9.9	
4.9 - 5.0	9	9.9-10.0	

Test date:	10/12/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	39.99

Remarks:

1. Test undertaken from existing ground level.
2. Test terminated at 6.50m; hammer bouncing on rods.

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

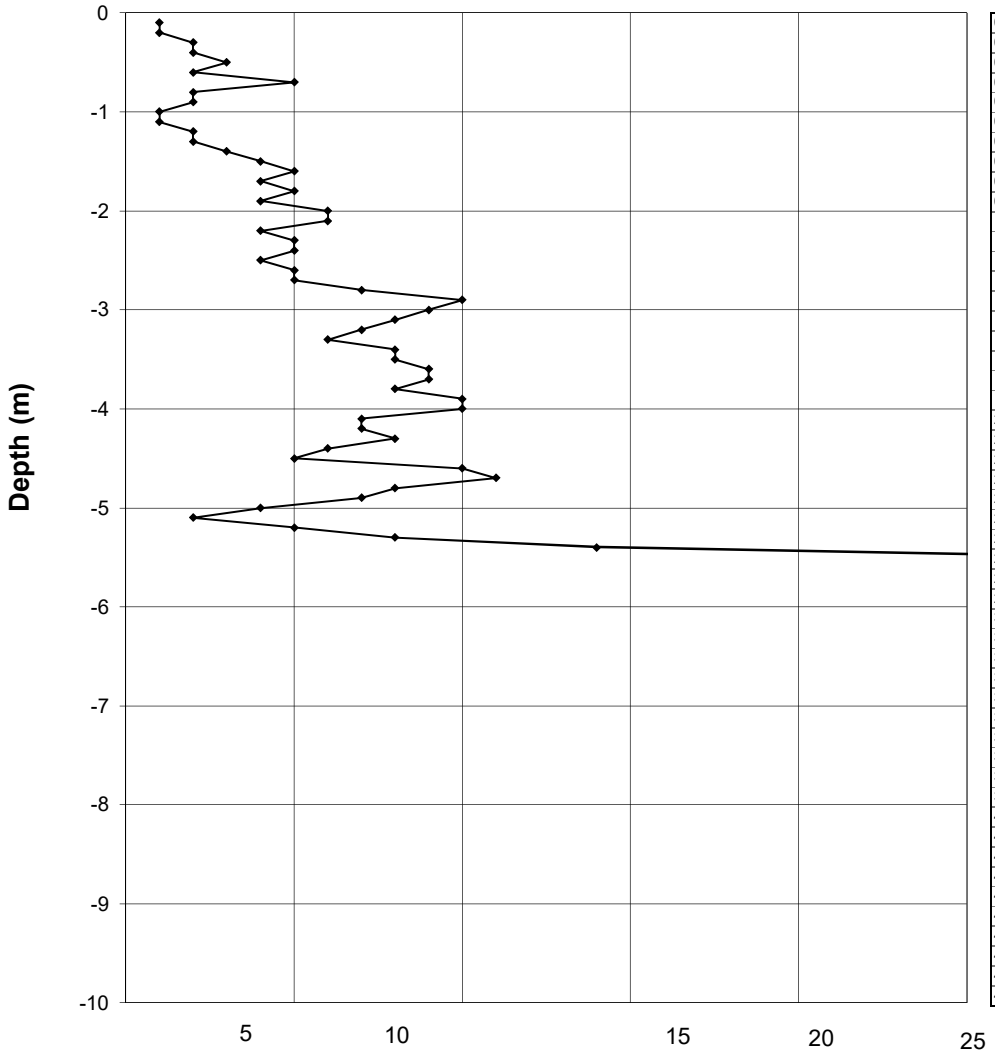
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP2

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	2
0.1 - 0.2	1	5.1 - 5.2	5
0.2 - 0.3	2	5.2 - 5.3	8
0.3 - 0.4	2	5.3 - 5.4	14
0.4 - 0.5	3	5.4 - 5.5	30
0.5 - 0.6	2	5.5 - 5.6	
0.6 - 0.7	5	5.6 - 5.7	
0.7 - 0.8	2	5.7 - 5.8	
0.8 - 0.9	2	5.8 - 5.9	
0.9 - 1.0	1	5.9 - 6.0	
1.0 - 1.1	1	6.0 - 6.1	
1.1 - 1.2	2	6.1 - 6.2	
1.2 - 1.3	2	6.2 - 6.3	
1.3 - 1.4	3	6.3 - 6.4	
1.4 - 1.5	4	6.4 - 6.5	
1.5 - 1.6	5	6.5 - 6.6	
1.6 - 1.7	4	6.6 - 6.7	
1.7 - 1.8	5	6.7 - 6.8	
1.8 - 1.9	4	6.8 - 6.9	
1.9 - 2.0	6	6.9 - 7.0	
2.0 - 2.1	6	7.0 - 7.1	
2.1 - 2.2	4	7.1 - 7.2	
2.2 - 2.3	5	7.2 - 7.3	
2.3 - 2.4	5	7.3 - 7.4	
2.4 - 2.5	4	7.4 - 7.5	
2.5 - 2.6	5	7.5 - 7.6	
2.6 - 2.7	5	7.6 - 7.7	
2.7 - 2.8	7	7.7 - 7.8	
2.8 - 2.9	10	7.8 - 7.9	
2.9 - 3.0	9	7.9 - 8.0	
3.0 - 3.1	8	8.0 - 8.1	
3.1 - 3.2	7	8.1 - 8.2	
3.2 - 3.3	6	8.2 - 8.3	
3.3 - 3.4	8	8.3 - 8.4	
3.4 - 3.5	8	8.4 - 8.5	
3.5 - 3.6	9	8.5 - 8.6	
3.6 - 3.7	9	8.6 - 8.7	
3.7 - 3.8	8	8.7 - 8.8	
3.8 - 3.9	10	8.8 - 8.9	
3.9 - 4.0	10	8.9 - 9.0	
4.0 - 4.1	7	9.0 - 9.1	
4.1 - 4.2	7	9.1 - 9.2	
4.2 - 4.3	8	9.2 - 9.3	
4.3 - 4.4	6	9.3 - 9.4	
4.4 - 4.5	5	9.4 - 9.5	
4.5 - 4.6	10	9.5 - 9.6	
4.6 - 4.7	11	9.6 - 9.7	
4.7 - 4.8	8	9.7 - 9.8	
4.8 - 4.9	7	9.8 - 9.9	
4.9 - 5.0	4	9.9-10.0	

Test date:	24/03/2020
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground Level:	40.09m

Remarks:

1. Test undertaken from existing ground level.
2. Test terminated at 5.50m; hammer bouncing on rods.

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

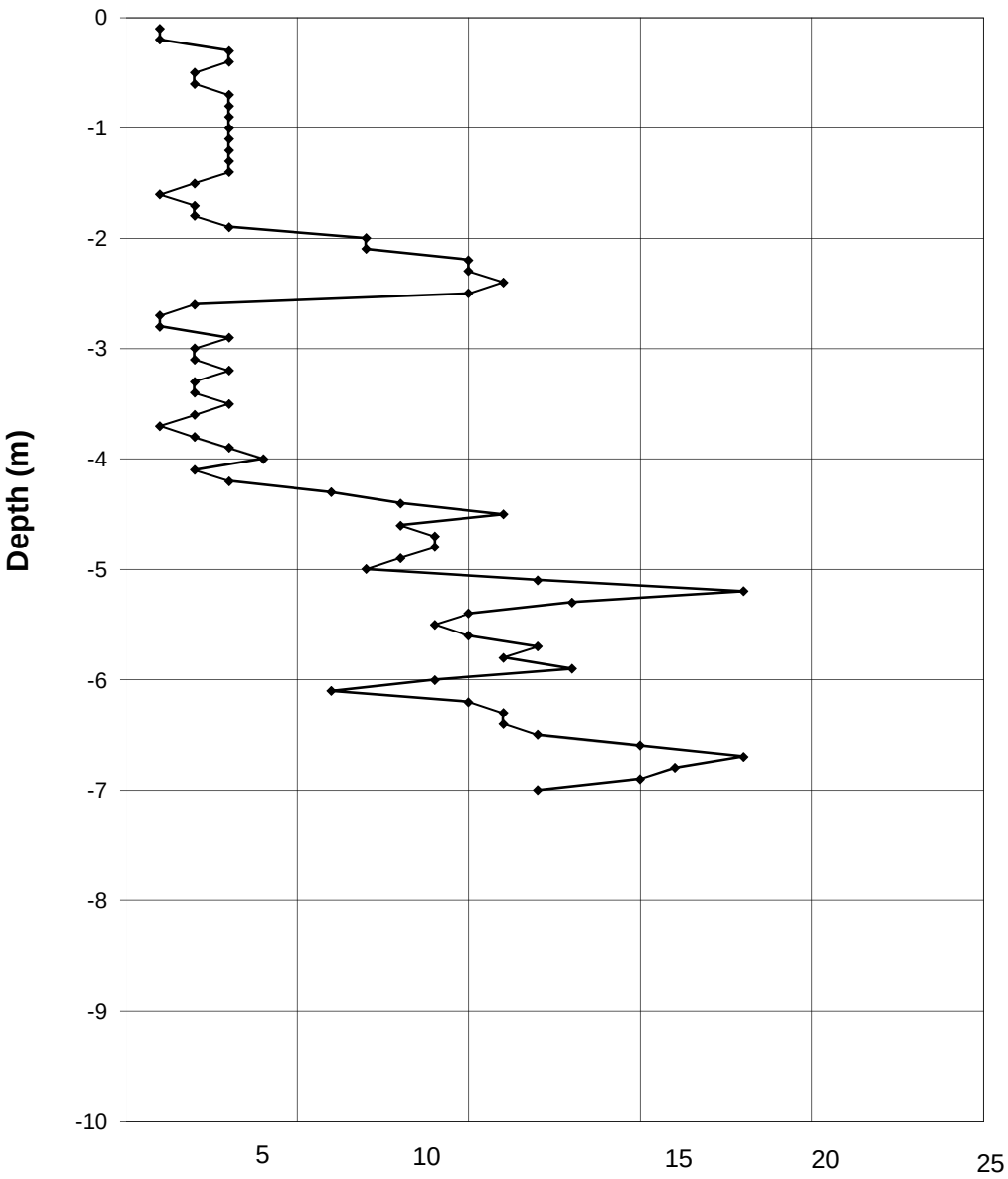
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP3

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	12
0.1 - 0.2	1	5.1 - 5.2	18
0.2 - 0.3	3	5.2 - 5.3	13
0.3 - 0.4	3	5.3 - 5.4	10
0.4 - 0.5	2	5.4 - 5.5	9
0.5 - 0.6	2	5.5 - 5.6	10
0.6 - 0.7	3	5.6 - 5.7	12
0.7 - 0.8	3	5.7 - 5.8	11
0.8 - 0.9	3	5.8 - 5.9	13
0.9 - 1.0	3	5.9 - 6.0	9
1.0 - 1.1	3	6.0 - 6.1	6
1.1 - 1.2	3	6.1 - 6.2	10
1.2 - 1.3	3	6.2 - 6.3	11
1.3 - 1.4	3	6.3 - 6.4	11
1.4 - 1.5	2	6.4 - 6.5	12
1.5 - 1.6	1	6.5 - 6.6	15
1.6 - 1.7	2	6.6 - 6.7	18
1.7 - 1.8	2	6.7 - 6.8	16
1.8 - 1.9	3	6.8 - 6.9	15
1.9 - 2.0	7	6.9 - 7.0	12
2.0 - 2.1	7	7.0 - 7.1	
2.1 - 2.2	10	7.1 - 7.2	
2.2 - 2.3	10	7.2 - 7.3	
2.3 - 2.4	11	7.3 - 7.4	
2.4 - 2.5	10	7.4 - 7.5	
2.5 - 2.6	2	7.5 - 7.6	
2.6 - 2.7	1	7.6 - 7.7	
2.7 - 2.8	1	7.7 - 7.8	
2.8 - 2.9	3	7.8 - 7.9	
2.9 - 3.0	2	7.9 - 8.0	
3.0 - 3.1	2	8.0 - 8.1	
3.1 - 3.2	3	8.1 - 8.2	
3.2 - 3.3	2	8.2 - 8.3	
3.3 - 3.4	2	8.3 - 8.4	
3.4 - 3.5	3	8.4 - 8.5	
3.5 - 3.6	2	8.5 - 8.6	
3.6 - 3.7	1	8.6 - 8.7	
3.7 - 3.8	2	8.7 - 8.8	
3.8 - 3.9	3	8.8 - 8.9	
3.9 - 4.0	4	8.9 - 9.0	
4.0 - 4.1	2	9.0 - 9.1	
4.1 - 4.2	3	9.1 - 9.2	
4.2 - 4.3	6	9.2 - 9.3	
4.3 - 4.4	8	9.3 - 9.4	
4.4 - 4.5	11	9.4 - 9.5	
4.5 - 4.6	8	9.5 - 9.6	
4.6 - 4.7	9	9.6 - 9.7	
4.7 - 4.8	9	9.7 - 9.8	
4.8 - 4.9	8	9.8 - 9.9	
4.9 - 5.0	7	9.9-10.0	

Test date:	10/12/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	40.85

Remarks:

1. Test undertaken from existing ground level.

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

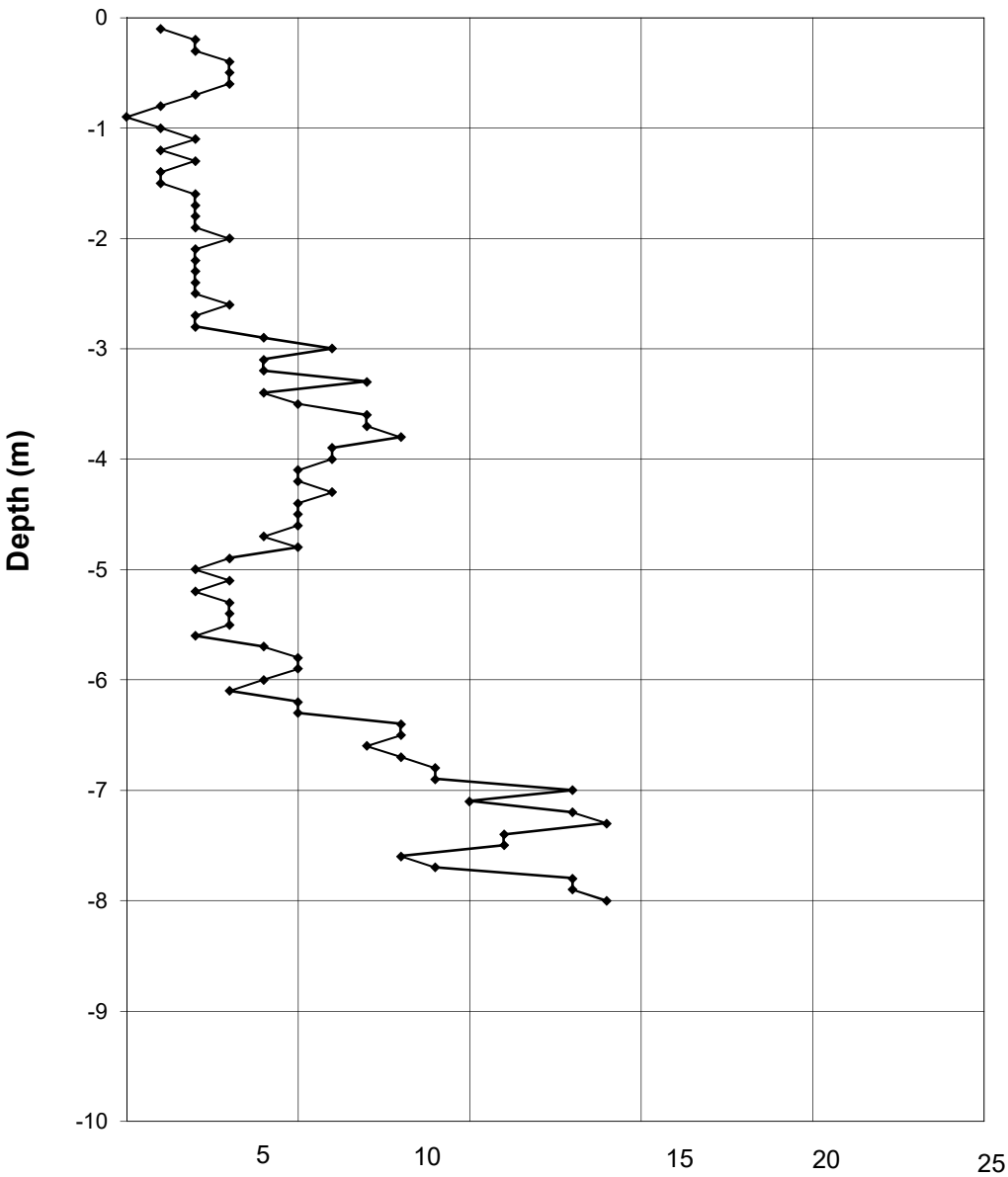
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP4

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	3
0.1 - 0.2	2	5.1 - 5.2	2
0.2 - 0.3	2	5.2 - 5.3	3
0.3 - 0.4	3	5.3 - 5.4	3
0.4 - 0.5	3	5.4 - 5.5	3
0.5 - 0.6	3	5.5 - 5.6	2
0.6 - 0.7	2	5.6 - 5.7	4
0.7 - 0.8	1	5.7 - 5.8	5
0.8 - 0.9	0	5.8 - 5.9	5
0.9 - 1.0	1	5.9 - 6.0	4
1.0 - 1.1	2	6.0 - 6.1	3
1.1 - 1.2	1	6.1 - 6.2	5
1.2 - 1.3	2	6.2 - 6.3	5
1.3 - 1.4	1	6.3 - 6.4	8
1.4 - 1.5	1	6.4 - 6.5	8
1.5 - 1.6	2	6.5 - 6.6	7
1.6 - 1.7	2	6.6 - 6.7	8
1.7 - 1.8	2	6.7 - 6.8	9
1.8 - 1.9	2	6.8 - 6.9	9
1.9 - 2.0	3	6.9 - 7.0	13
2.0 - 2.1	2	7.0 - 7.1	10
2.1 - 2.2	2	7.1 - 7.2	13
2.2 - 2.3	2	7.2 - 7.3	14
2.3 - 2.4	2	7.3 - 7.4	11
2.4 - 2.5	2	7.4 - 7.5	11
2.5 - 2.6	3	7.5 - 7.6	8
2.6 - 2.7	2	7.6 - 7.7	9
2.7 - 2.8	2	7.7 - 7.8	13
2.8 - 2.9	4	7.8 - 7.9	13
2.9 - 3.0	6	7.9 - 8.0	14
3.0 - 3.1	4	8.0 - 8.1	
3.1 - 3.2	4	8.1 - 8.2	
3.2 - 3.3	7	8.2 - 8.3	
3.3 - 3.4	4	8.3 - 8.4	
3.4 - 3.5	5	8.4 - 8.5	
3.5 - 3.6	7	8.5 - 8.6	
3.6 - 3.7	7	8.6 - 8.7	
3.7 - 3.8	8	8.7 - 8.8	
3.8 - 3.9	6	8.8 - 8.9	
3.9 - 4.0	6	8.9 - 9.0	
4.0 - 4.1	5	9.0 - 9.1	
4.1 - 4.2	5	9.1 - 9.2	
4.2 - 4.3	6	9.2 - 9.3	
4.3 - 4.4	5	9.3 - 9.4	
4.4 - 4.5	5	9.4 - 9.5	
4.5 - 4.6	5	9.5 - 9.6	
4.6 - 4.7	4	9.6 - 9.7	
4.7 - 4.8	5	9.7 - 9.8	
4.8 - 4.9	3	9.8 - 9.9	
4.9 - 5.0	2	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	24/03/2020
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	40.56

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

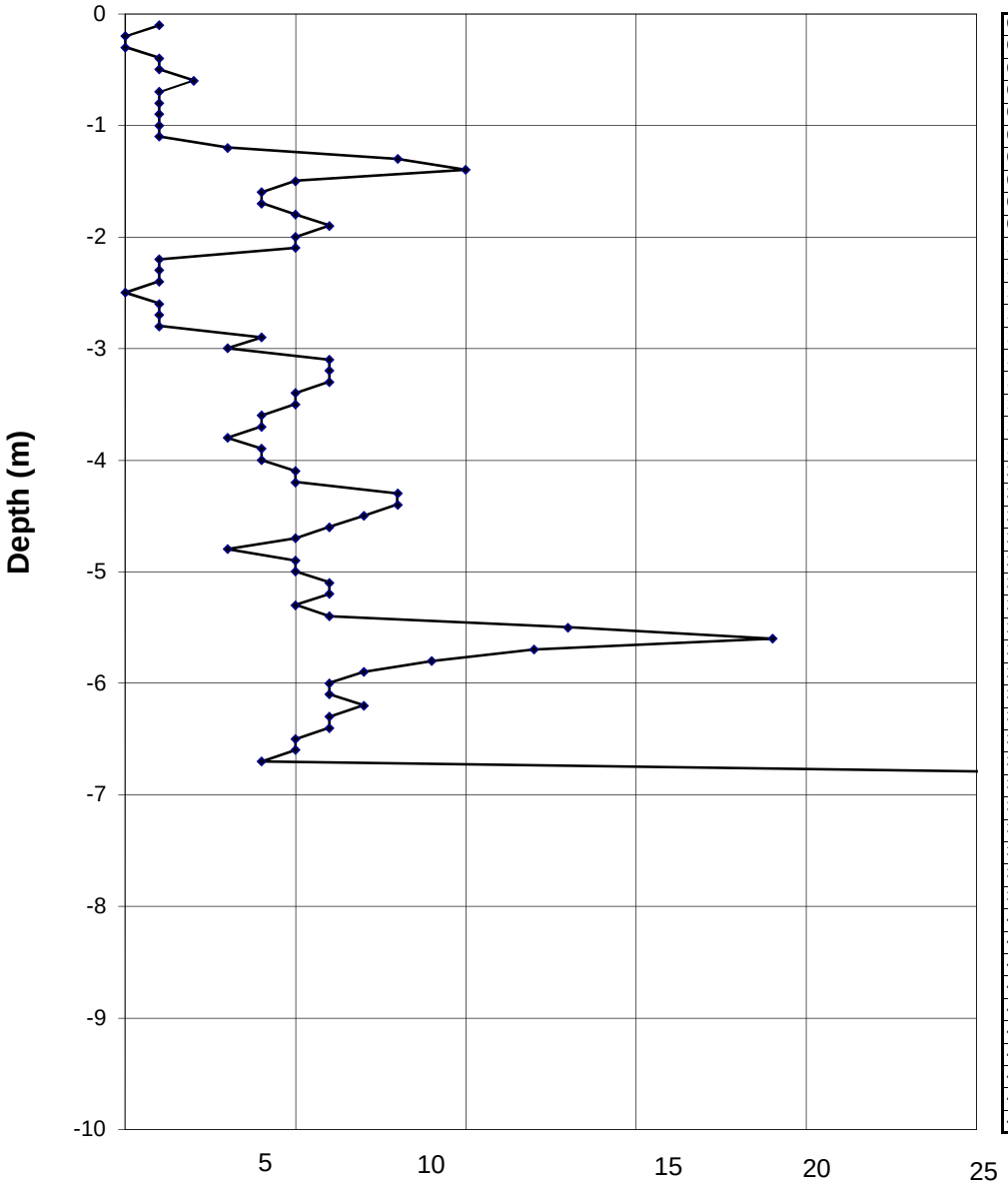
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP5

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	6
0.1 - 0.2	0	5.1 - 5.2	6
0.2 - 0.3	0	5.2 - 5.3	5
0.3 - 0.4	1	5.3 - 5.4	6
0.4 - 0.5	1	5.4 - 5.5	13
0.5 - 0.6	2	5.5 - 5.6	19
0.6 - 0.7	1	5.6 - 5.7	12
0.7 - 0.8	1	5.7 - 5.8	9
0.8 - 0.9	1	5.8 - 5.9	7
0.9 - 1.0	1	5.9 - 6.0	6
1.0 - 1.1	1	6.0 - 6.1	6
1.1 - 1.2	3	6.1 - 6.2	7
1.2 - 1.3	8	6.2 - 6.3	6
1.3 - 1.4	10	6.3 - 6.4	6
1.4 - 1.5	5	6.4 - 6.5	5
1.5 - 1.6	4	6.5 - 6.6	5
1.6 - 1.7	4	6.6 - 6.7	4
1.7 - 1.8	5	6.7 - 6.8	27
1.8 - 1.9	6	6.8 - 6.9	
1.9 - 2.0	5	6.9 - 7.0	
2.0 - 2.1	5	7.0 - 7.1	
2.1 - 2.2	1	7.1 - 7.2	
2.2 - 2.3	1	7.2 - 7.3	
2.3 - 2.4	1	7.3 - 7.4	
2.4 - 2.5	0	7.4 - 7.5	
2.5 - 2.6	1	7.5 - 7.6	
2.6 - 2.7	1	7.6 - 7.7	
2.7 - 2.8	1	7.7 - 7.8	
2.8 - 2.9	4	7.8 - 7.9	
2.9 - 3.0	3	7.9 - 8.0	
3.0 - 3.1	6	8.0 - 8.1	
3.1 - 3.2	6	8.1 - 8.2	
3.2 - 3.3	6	8.2 - 8.3	
3.3 - 3.4	5	8.3 - 8.4	
3.4 - 3.5	5	8.4 - 8.5	
3.5 - 3.6	4	8.5 - 8.6	
3.6 - 3.7	4	8.6 - 8.7	
3.7 - 3.8	3	8.7 - 8.8	
3.8 - 3.9	4	8.8 - 8.9	
3.9 - 4.0	4	8.9 - 9.0	
4.0 - 4.1	5	9.0 - 9.1	
4.1 - 4.2	5	9.1 - 9.2	
4.2 - 4.3	8	9.2 - 9.3	
4.3 - 4.4	8	9.3 - 9.4	
4.4 - 4.5	7	9.4 - 9.5	
4.5 - 4.6	6	9.5 - 9.6	
4.6 - 4.7	5	9.6 - 9.7	
4.7 - 4.8	3	9.7 - 9.8	
4.8 - 4.9	5	9.8 - 9.9	
4.9 - 5.0	5	9.9-10.0	

Test date:	10/12/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Reduced level (m)	41.10

Remarks:

1. Test undertaken from existing ground level.
2. Test terminated at 6.80m; hammer bouncing on rods.

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

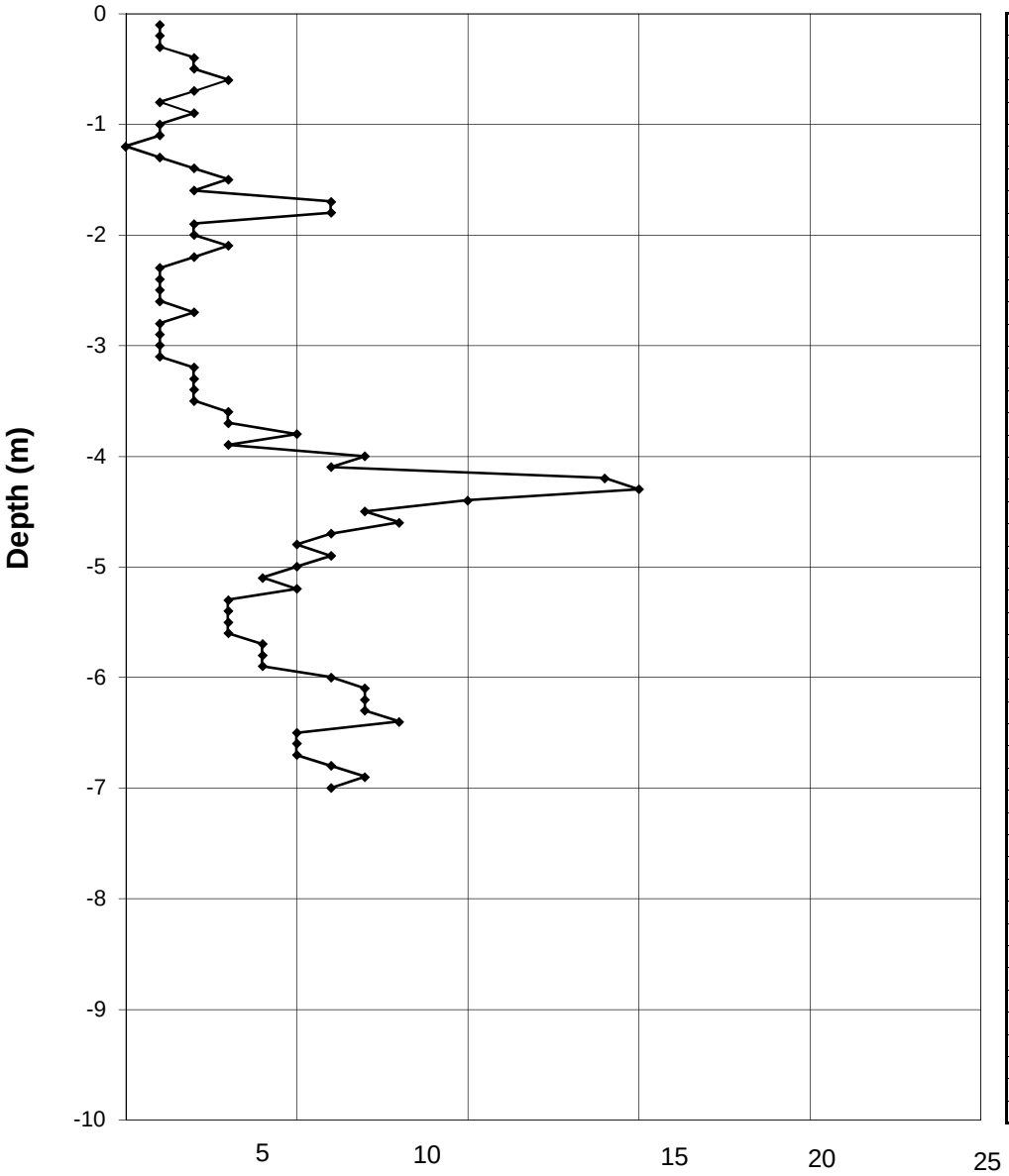
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP6

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	4
0.1 - 0.2	1	5.1 - 5.2	5
0.2 - 0.3	1	5.2 - 5.3	3
0.3 - 0.4	2	5.3 - 5.4	3
0.4 - 0.5	2	5.4 - 5.5	3
0.5 - 0.6	3	5.5 - 5.6	3
0.6 - 0.7	2	5.6 - 5.7	4
0.7 - 0.8	1	5.7 - 5.8	4
0.8 - 0.9	2	5.8 - 5.9	4
0.9 - 1.0	1	5.9 - 6.0	6
1.0 - 1.1	1	6.0 - 6.1	7
1.1 - 1.2	0	6.1 - 6.2	7
1.2 - 1.3	1	6.2 - 6.3	7
1.3 - 1.4	2	6.3 - 6.4	8
1.4 - 1.5	3	6.4 - 6.5	5
1.5 - 1.6	2	6.5 - 6.6	5
1.6 - 1.7	6	6.6 - 6.7	5
1.7 - 1.8	6	6.7 - 6.8	6
1.8 - 1.9	2	6.8 - 6.9	7
1.9 - 2.0	2	6.9 - 7.0	6
2.0 - 2.1	3	7.0 - 7.1	
2.1 - 2.2	2	7.1 - 7.2	
2.2 - 2.3	1	7.2 - 7.3	
2.3 - 2.4	1	7.3 - 7.4	
2.4 - 2.5	1	7.4 - 7.5	
2.5 - 2.6	1	7.5 - 7.6	
2.6 - 2.7	2	7.6 - 7.7	
2.7 - 2.8	1	7.7 - 7.8	
2.8 - 2.9	1	7.8 - 7.9	
2.9 - 3.0	1	7.9 - 8.0	
3.0 - 3.1	1	8.0 - 8.1	
3.1 - 3.2	2	8.1 - 8.2	
3.2 - 3.3	2	8.2 - 8.3	
3.3 - 3.4	2	8.3 - 8.4	
3.4 - 3.5	2	8.4 - 8.5	
3.5 - 3.6	3	8.5 - 8.6	
3.6 - 3.7	3	8.6 - 8.7	
3.7 - 3.8	5	8.7 - 8.8	
3.8 - 3.9	3	8.8 - 8.9	
3.9 - 4.0	7	8.9 - 9.0	
4.0 - 4.1	6	9.0 - 9.1	
4.1 - 4.2	14	9.1 - 9.2	
4.2 - 4.3	15	9.2 - 9.3	
4.3 - 4.4	10	9.3 - 9.4	
4.4 - 4.5	7	9.4 - 9.5	
4.5 - 4.6	8	9.5 - 9.6	
4.6 - 4.7	6	9.6 - 9.7	
4.7 - 4.8	5	9.7 - 9.8	
4.8 - 4.9	6	9.8 - 9.9	
4.9 - 5.0	5	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	10/12/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Reduced level (m)	41.36

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

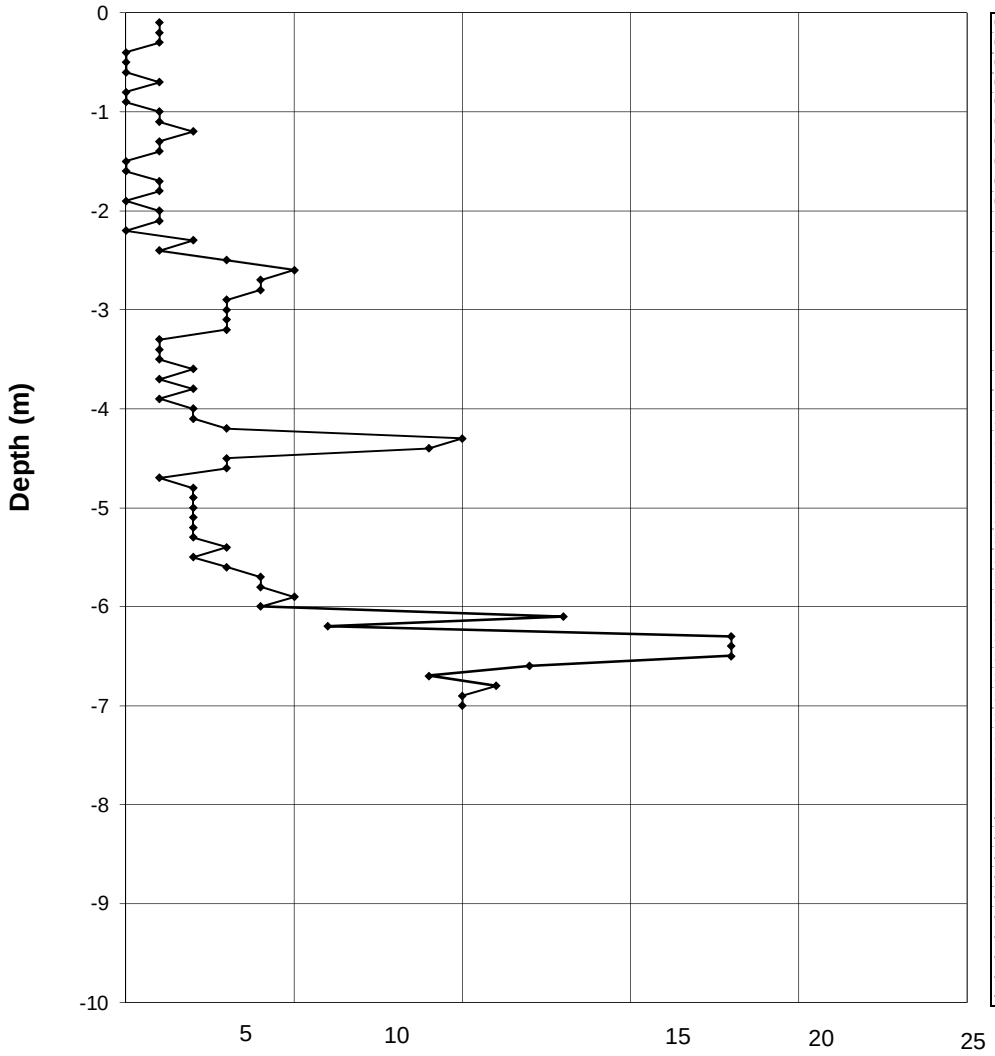
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP7

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	2
0.1 - 0.2	1	5.1 - 5.2	2
0.2 - 0.3	1	5.2 - 5.3	2
0.3 - 0.4	0	5.3 - 5.4	3
0.4 - 0.5	0	5.4 - 5.5	2
0.5 - 0.6	0	5.5 - 5.6	3
0.6 - 0.7	1	5.6 - 5.7	4
0.7 - 0.8	0	5.7 - 5.8	4
0.8 - 0.9	0	5.8 - 5.9	5
0.9 - 1.0	1	5.9 - 6.0	4
1.0 - 1.1	1	6.0 - 6.1	13
1.1 - 1.2	2	6.1 - 6.2	6
1.2 - 1.3	1	6.2 - 6.3	18
1.3 - 1.4	1	6.3 - 6.4	18
1.4 - 1.5	0	6.4 - 6.5	18
1.5 - 1.6	0	6.5 - 6.6	12
1.6 - 1.7	1	6.6 - 6.7	9
1.7 - 1.8	1	6.7 - 6.8	11
1.8 - 1.9	0	6.8 - 6.9	10
1.9 - 2.0	1	6.9 - 7.0	10
2.0 - 2.1	1	7.0 - 7.1	
2.1 - 2.2	0	7.1 - 7.2	
2.2 - 2.3	2	7.2 - 7.3	
2.3 - 2.4	1	7.3 - 7.4	
2.4 - 2.5	3	7.4 - 7.5	
2.5 - 2.6	5	7.5 - 7.6	
2.6 - 2.7	4	7.6 - 7.7	
2.7 - 2.8	4	7.7 - 7.8	
2.8 - 2.9	3	7.8 - 7.9	
2.9 - 3.0	3	7.9 - 8.0	
3.0 - 3.1	3	8.0 - 8.1	
3.1 - 3.2	3	8.1 - 8.2	
3.2 - 3.3	1	8.2 - 8.3	
3.3 - 3.4	1	8.3 - 8.4	
3.4 - 3.5	1	8.4 - 8.5	
3.5 - 3.6	2	8.5 - 8.6	
3.6 - 3.7	1	8.6 - 8.7	
3.7 - 3.8	2	8.7 - 8.8	
3.8 - 3.9	1	8.8 - 8.9	
3.9 - 4.0	2	8.9 - 9.0	
4.0 - 4.1	2	9.0 - 9.1	
4.1 - 4.2	3	9.1 - 9.2	
4.2 - 4.3	10	9.2 - 9.3	
4.3 - 4.4	9	9.3 - 9.4	
4.4 - 4.5	3	9.4 - 9.5	
4.5 - 4.6	3	9.5 - 9.6	
4.6 - 4.7	1	9.6 - 9.7	
4.7 - 4.8	2	9.7 - 9.8	
4.8 - 4.9	2	9.8 - 9.9	
4.9 - 5.0	2	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	10/12/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	41.37

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

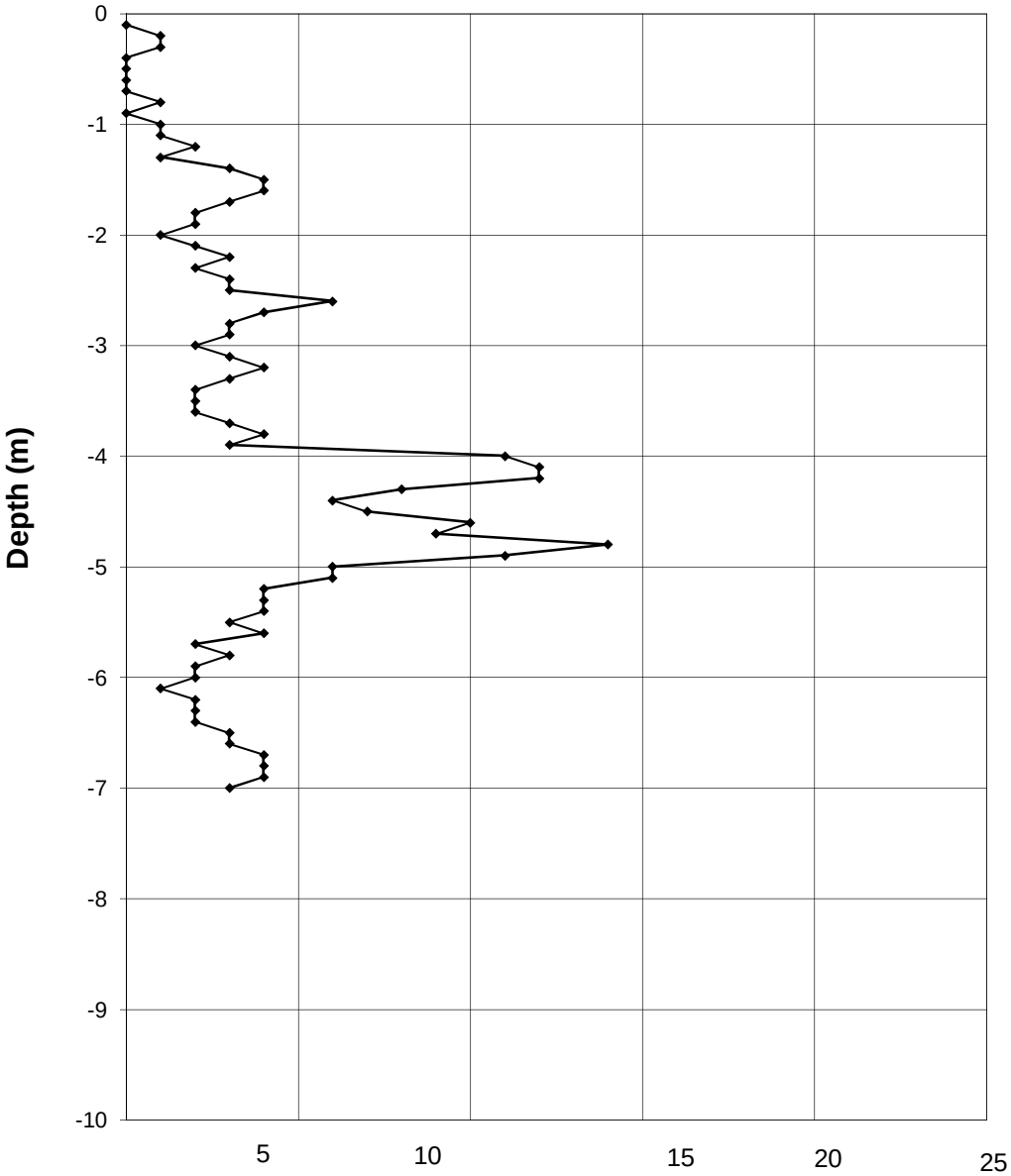
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP8

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	0	5.0 - 5.1	6
0.1 - 0.2	1	5.1 - 5.2	4
0.2 - 0.3	1	5.2 - 5.3	4
0.3 - 0.4	0	5.3 - 5.4	4
0.4 - 0.5	0	5.4 - 5.5	3
0.5 - 0.6	0	5.5 - 5.6	4
0.6 - 0.7	0	5.6 - 5.7	2
0.7 - 0.8	1	5.7 - 5.8	3
0.8 - 0.9	0	5.8 - 5.9	2
0.9 - 1.0	1	5.9 - 6.0	2
1.0 - 1.1	1	6.0 - 6.1	1
1.1 - 1.2	2	6.1 - 6.2	2
1.2 - 1.3	1	6.2 - 6.3	2
1.3 - 1.4	3	6.3 - 6.4	2
1.4 - 1.5	4	6.4 - 6.5	3
1.5 - 1.6	4	6.5 - 6.6	3
1.6 - 1.7	3	6.6 - 6.7	4
1.7 - 1.8	2	6.7 - 6.8	4
1.8 - 1.9	2	6.8 - 6.9	4
1.9 - 2.0	1	6.9 - 7.0	3
2.0 - 2.1	2	7.0 - 7.1	
2.1 - 2.2	3	7.1 - 7.2	
2.2 - 2.3	2	7.2 - 7.3	
2.3 - 2.4	3	7.3 - 7.4	
2.4 - 2.5	3	7.4 - 7.5	
2.5 - 2.6	6	7.5 - 7.6	
2.6 - 2.7	4	7.6 - 7.7	
2.7 - 2.8	3	7.7 - 7.8	
2.8 - 2.9	3	7.8 - 7.9	
2.9 - 3.0	2	7.9 - 8.0	
3.0 - 3.1	3	8.0 - 8.1	
3.1 - 3.2	4	8.1 - 8.2	
3.2 - 3.3	3	8.2 - 8.3	
3.3 - 3.4	2	8.3 - 8.4	
3.4 - 3.5	2	8.4 - 8.5	
3.5 - 3.6	2	8.5 - 8.6	
3.6 - 3.7	3	8.6 - 8.7	
3.7 - 3.8	4	8.7 - 8.8	
3.8 - 3.9	3	8.8 - 8.9	
3.9 - 4.0	11	8.9 - 9.0	
4.0 - 4.1	12	9.0 - 9.1	
4.1 - 4.2	12	9.1 - 9.2	
4.2 - 4.3	8	9.2 - 9.3	
4.3 - 4.4	6	9.3 - 9.4	
4.4 - 4.5	7	9.4 - 9.5	
4.5 - 4.6	10	9.5 - 9.6	
4.6 - 4.7	9	9.6 - 9.7	
4.7 - 4.8	14	9.7 - 9.8	
4.8 - 4.9	11	9.8 - 9.9	
4.9 - 5.0	6	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	16/10/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	41.80

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

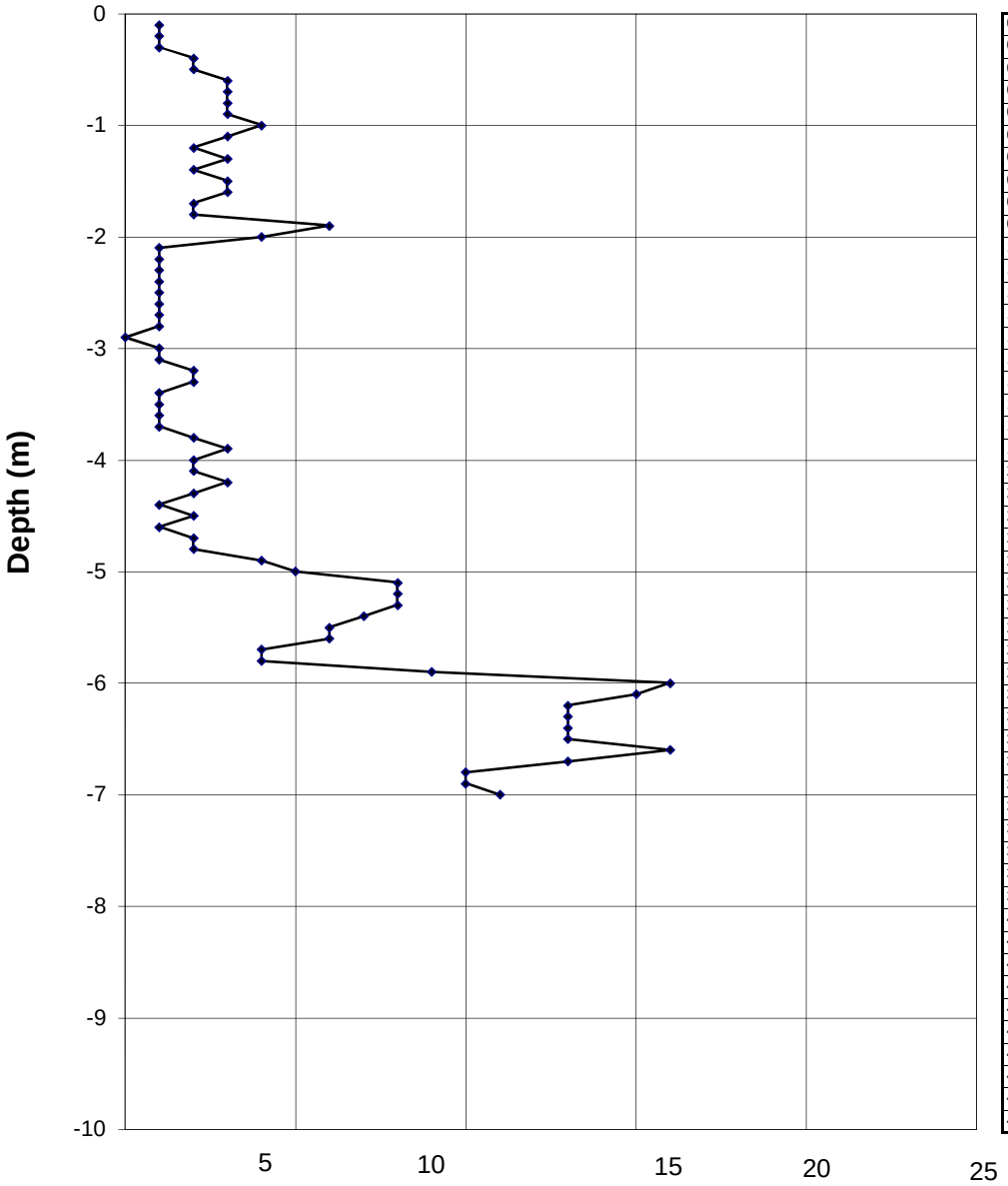
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP9

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	8
0.1 - 0.2	1	5.1 - 5.2	8
0.2 - 0.3	1	5.2 - 5.3	8
0.3 - 0.4	2	5.3 - 5.4	7
0.4 - 0.5	2	5.4 - 5.5	6
0.5 - 0.6	3	5.5 - 5.6	6
0.6 - 0.7	3	5.6 - 5.7	4
0.7 - 0.8	3	5.7 - 5.8	4
0.8 - 0.9	3	5.8 - 5.9	9
0.9 - 1.0	4	5.9 - 6.0	16
1.0 - 1.1	3	6.0 - 6.1	15
1.1 - 1.2	2	6.1 - 6.2	13
1.2 - 1.3	3	6.2 - 6.3	13
1.3 - 1.4	2	6.3 - 6.4	13
1.4 - 1.5	3	6.4 - 6.5	13
1.5 - 1.6	3	6.5 - 6.6	16
1.6 - 1.7	2	6.6 - 6.7	13
1.7 - 1.8	2	6.7 - 6.8	10
1.8 - 1.9	6	6.8 - 6.9	10
1.9 - 2.0	4	6.9 - 7.0	11
2.0 - 2.1	1	7.0 - 7.1	
2.1 - 2.2	1	7.1 - 7.2	
2.2 - 2.3	1	7.2 - 7.3	
2.3 - 2.4	1	7.3 - 7.4	
2.4 - 2.5	1	7.4 - 7.5	
2.5 - 2.6	1	7.5 - 7.6	
2.6 - 2.7	1	7.6 - 7.7	
2.7 - 2.8	1	7.7 - 7.8	
2.8 - 2.9	0	7.8 - 7.9	
2.9 - 3.0	1	7.9 - 8.0	
3.0 - 3.1	1	8.0 - 8.1	
3.1 - 3.2	2	8.1 - 8.2	
3.2 - 3.3	2	8.2 - 8.3	
3.3 - 3.4	1	8.3 - 8.4	
3.4 - 3.5	1	8.4 - 8.5	
3.5 - 3.6	1	8.5 - 8.6	
3.6 - 3.7	1	8.6 - 8.7	
3.7 - 3.8	2	8.7 - 8.8	
3.8 - 3.9	3	8.8 - 8.9	
3.9 - 4.0	2	8.9 - 9.0	
4.0 - 4.1	2	9.0 - 9.1	
4.1 - 4.2	3	9.1 - 9.2	
4.2 - 4.3	2	9.2 - 9.3	
4.3 - 4.4	1	9.3 - 9.4	
4.4 - 4.5	2	9.4 - 9.5	
4.5 - 4.6	1	9.5 - 9.6	
4.6 - 4.7	2	9.6 - 9.7	
4.7 - 4.8	2	9.7 - 9.8	
4.8 - 4.9	4	9.8 - 9.9	
4.9 - 5.0	5	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	16/10/2019
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Reduced level (m)	41.26

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

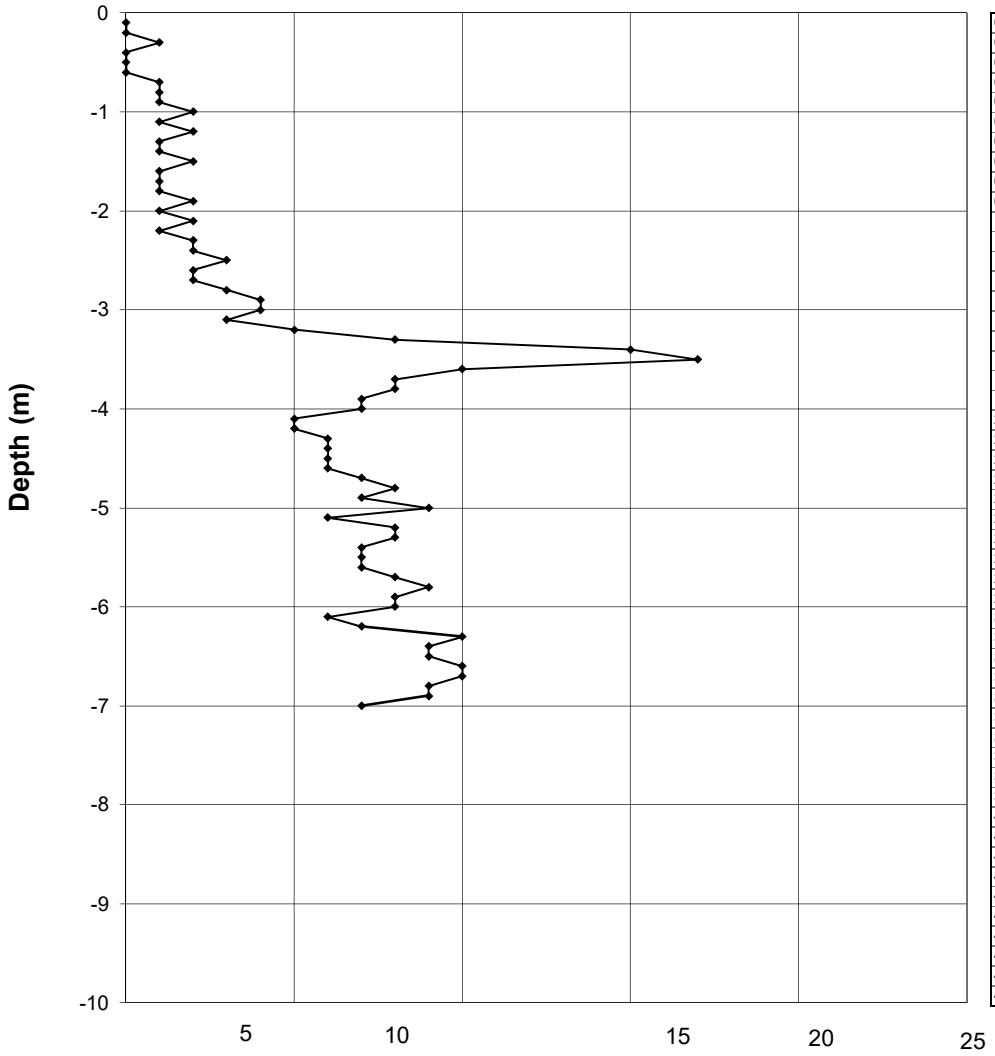
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP11

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	0	5.0 - 5.1	6
0.1 - 0.2	0	5.1 - 5.2	8
0.2 - 0.3	1	5.2 - 5.3	8
0.3 - 0.4	0	5.3 - 5.4	7
0.4 - 0.5	0	5.4 - 5.5	7
0.5 - 0.6	0	5.5 - 5.6	7
0.6 - 0.7	1	5.6 - 5.7	8
0.7 - 0.8	1	5.7 - 5.8	9
0.8 - 0.9	1	5.8 - 5.9	8
0.9 - 1.0	2	5.9 - 6.0	8
1.0 - 1.1	1	6.0 - 6.1	6
1.1 - 1.2	2	6.1 - 6.2	7
1.2 - 1.3	1	6.2 - 6.3	10
1.3 - 1.4	1	6.3 - 6.4	9
1.4 - 1.5	2	6.4 - 6.5	9
1.5 - 1.6	1	6.5 - 6.6	10
1.6 - 1.7	1	6.6 - 6.7	10
1.7 - 1.8	1	6.7 - 6.8	9
1.8 - 1.9	2	6.8 - 6.9	9
1.9 - 2.0	1	6.9 - 7.0	7
2.0 - 2.1	2	7.0 - 7.1	
2.1 - 2.2	1	7.1 - 7.2	
2.2 - 2.3	2	7.2 - 7.3	
2.3 - 2.4	2	7.3 - 7.4	
2.4 - 2.5	3	7.4 - 7.5	
2.5 - 2.6	2	7.5 - 7.6	
2.6 - 2.7	2	7.6 - 7.7	
2.7 - 2.8	3	7.7 - 7.8	
2.8 - 2.9	4	7.8 - 7.9	
2.9 - 3.0	4	7.9 - 8.0	
3.0 - 3.1	3	8.0 - 8.1	
3.1 - 3.2	5	8.1 - 8.2	
3.2 - 3.3	8	8.2 - 8.3	
3.3 - 3.4	15	8.3 - 8.4	
3.4 - 3.5	17	8.4 - 8.5	
3.5 - 3.6	10	8.5 - 8.6	
3.6 - 3.7	8	8.6 - 8.7	
3.7 - 3.8	8	8.7 - 8.8	
3.8 - 3.9	7	8.8 - 8.9	
3.9 - 4.0	7	8.9 - 9.0	
4.0 - 4.1	5	9.0 - 9.1	
4.1 - 4.2	5	9.1 - 9.2	
4.2 - 4.3	6	9.2 - 9.3	
4.3 - 4.4	6	9.3 - 9.4	
4.4 - 4.5	6	9.4 - 9.5	
4.5 - 4.6	6	9.5 - 9.6	
4.6 - 4.7	7	9.6 - 9.7	
4.7 - 4.8	8	9.7 - 9.8	
4.8 - 4.9	7	9.8 - 9.9	
4.9 - 5.0	9	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	11/02/2020
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	40.64

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

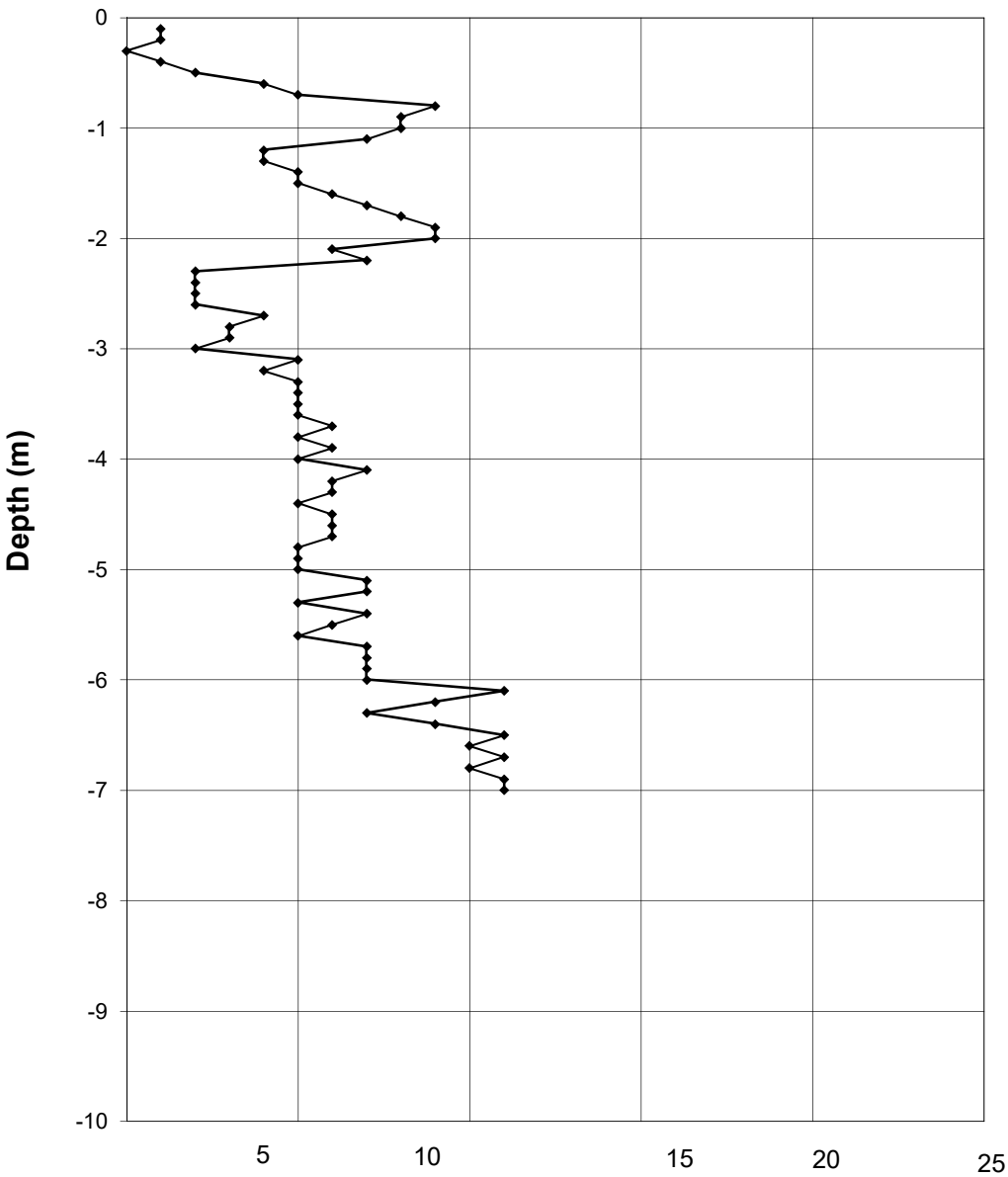
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP12

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	1	5.0 - 5.1	7
0.1 - 0.2	1	5.1 - 5.2	7
0.2 - 0.3	0	5.2 - 5.3	5
0.3 - 0.4	1	5.3 - 5.4	7
0.4 - 0.5	2	5.4 - 5.5	6
0.5 - 0.6	4	5.5 - 5.6	5
0.6 - 0.7	5	5.6 - 5.7	7
0.7 - 0.8	9	5.7 - 5.8	7
0.8 - 0.9	8	5.8 - 5.9	7
0.9 - 1.0	8	5.9 - 6.0	7
1.0 - 1.1	7	6.0 - 6.1	11
1.1 - 1.2	4	6.1 - 6.2	9
1.2 - 1.3	4	6.2 - 6.3	7
1.3 - 1.4	5	6.3 - 6.4	9
1.4 - 1.5	5	6.4 - 6.5	11
1.5 - 1.6	6	6.5 - 6.6	10
1.6 - 1.7	7	6.6 - 6.7	11
1.7 - 1.8	8	6.7 - 6.8	10
1.8 - 1.9	9	6.8 - 6.9	11
1.9 - 2.0	9	6.9 - 7.0	11
2.0 - 2.1	6	7.0 - 7.1	
2.1 - 2.2	7	7.1 - 7.2	
2.2 - 2.3	2	7.2 - 7.3	
2.3 - 2.4	2	7.3 - 7.4	
2.4 - 2.5	2	7.4 - 7.5	
2.5 - 2.6	2	7.5 - 7.6	
2.6 - 2.7	4	7.6 - 7.7	
2.7 - 2.8	3	7.7 - 7.8	
2.8 - 2.9	3	7.8 - 7.9	
2.9 - 3.0	2	7.9 - 8.0	
3.0 - 3.1	5	8.0 - 8.1	
3.1 - 3.2	4	8.1 - 8.2	
3.2 - 3.3	5	8.2 - 8.3	
3.3 - 3.4	5	8.3 - 8.4	
3.4 - 3.5	5	8.4 - 8.5	
3.5 - 3.6	5	8.5 - 8.6	
3.6 - 3.7	6	8.6 - 8.7	
3.7 - 3.8	5	8.7 - 8.8	
3.8 - 3.9	6	8.8 - 8.9	
3.9 - 4.0	5	8.9 - 9.0	
4.0 - 4.1	7	9.0 - 9.1	
4.1 - 4.2	6	9.1 - 9.2	
4.2 - 4.3	6	9.2 - 9.3	
4.3 - 4.4	5	9.3 - 9.4	
4.4 - 4.5	6	9.4 - 9.5	
4.5 - 4.6	6	9.5 - 9.6	
4.6 - 4.7	6	9.6 - 9.7	
4.7 - 4.8	5	9.7 - 9.8	
4.8 - 4.9	5	9.8 - 9.9	
4.9 - 5.0	5	9.9-10.0	

Remarks:

Test date:	12/02/2020
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Ground level (m)	41.56

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

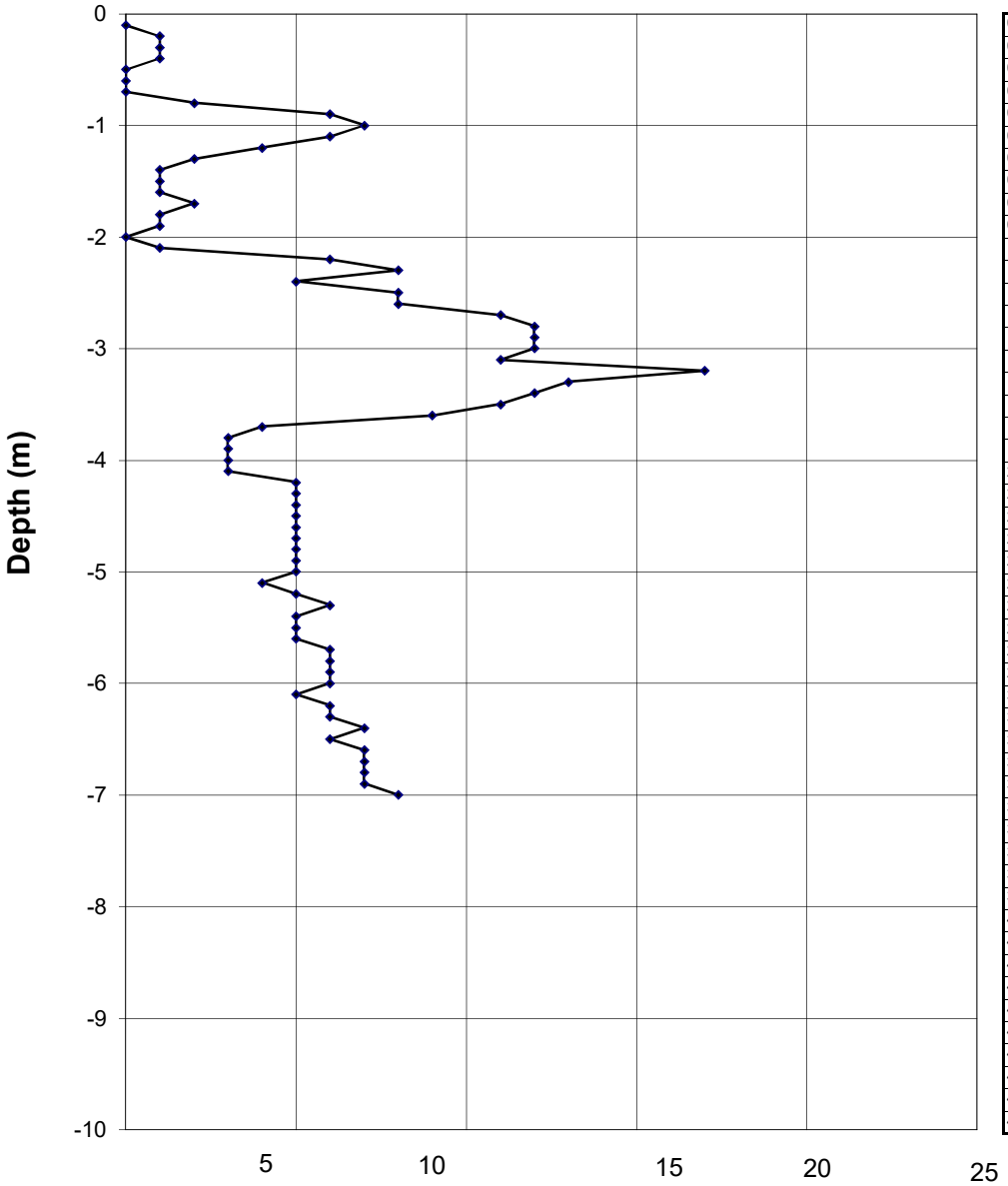
DYNAMIC PROBE TEST RESULTS

PLOT OF BLOW COUNTS AGAINST DEPTH

Probe No. DP13

Blows per 100mm Penetration

Plot



Values

Depth	Count	Depth	Count
0.0 - 0.1	0	5.0 - 5.1	4
0.1 - 0.2	1	5.1 - 5.2	5
0.2 - 0.3	1	5.2 - 5.3	6
0.3 - 0.4	1	5.3 - 5.4	5
0.4 - 0.5	0	5.4 - 5.5	5
0.5 - 0.6	0	5.5 - 5.6	5
0.6 - 0.7	0	5.6 - 5.7	6
0.7 - 0.8	2	5.7 - 5.8	6
0.8 - 0.9	6	5.8 - 5.9	6
0.9 - 1.0	7	5.9 - 6.0	6
1.0 - 1.1	6	6.0 - 6.1	5
1.1 - 1.2	4	6.1 - 6.2	6
1.2 - 1.3	2	6.2 - 6.3	6
1.3 - 1.4	1	6.3 - 6.4	7
1.4 - 1.5	1	6.4 - 6.5	6
1.5 - 1.6	1	6.5 - 6.6	7
1.6 - 1.7	2	6.6 - 6.7	7
1.7 - 1.8	1	6.7 - 6.8	7
1.8 - 1.9	1	6.8 - 6.9	7
1.9 - 2.0	0	6.9 - 7.0	8
2.0 - 2.1	1	7.0 - 7.1	
2.1 - 2.2	6	7.1 - 7.2	
2.2 - 2.3	8	7.2 - 7.3	
2.3 - 2.4	5	7.3 - 7.4	
2.4 - 2.5	8	7.4 - 7.5	
2.5 - 2.6	8	7.5 - 7.6	
2.6 - 2.7	11	7.6 - 7.7	
2.7 - 2.8	12	7.7 - 7.8	
2.8 - 2.9	12	7.8 - 7.9	
2.9 - 3.0	12	7.9 - 8.0	
3.0 - 3.1	11	8.0 - 8.1	
3.1 - 3.2	17	8.1 - 8.2	
3.2 - 3.3	13	8.2 - 8.3	
3.3 - 3.4	12	8.3 - 8.4	
3.4 - 3.5	11	8.4 - 8.5	
3.5 - 3.6	9	8.5 - 8.6	
3.6 - 3.7	4	8.6 - 8.7	
3.7 - 3.8	3	8.7 - 8.8	
3.8 - 3.9	3	8.8 - 8.9	
3.9 - 4.0	3	8.9 - 9.0	
4.0 - 4.1	3	9.0 - 9.1	
4.1 - 4.2	5	9.1 - 9.2	
4.2 - 4.3	5	9.2 - 9.3	
4.3 - 4.4	5	9.3 - 9.4	
4.4 - 4.5	5	9.4 - 9.5	
4.5 - 4.6	5	9.5 - 9.6	
4.6 - 4.7	5	9.6 - 9.7	
4.7 - 4.8	5	9.7 - 9.8	
4.8 - 4.9	5	9.8 - 9.9	
4.9 - 5.0	5	9.9-10.0	

Remarks:

1. Test undertaken from existing ground level.

Test date:	12/02/2020
Rig Type:	Premier Compact 110.
Anvil Mass:	63.5kg.
Drop Height (m)	0.76
Cone Diameter (mm)	50
Reduced level (m)	42.03

Project No. G19179
Project: Boulton Moor, Derby.
Client: Persimmon Homes.

NICHOLLS COLTON GROUP

APPENDIX F

Laboratory Test Results - Geotechnical

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

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

Analytical Test Report: G19179-A/002 - Amendment A

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	23/01/2020
Your Order Number:	G19179-A	Testing Instruction Received:	22/01/2020
Report Issue Number:	2	Sample Tested:	22/01 to 14/02/2020
Samples Analysed:	19 soil samples	Report issued:	13/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were taken by NC.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Particle Size Distribution Sedimentation

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.4 sedimentation by pipette method.

The samples were not treated in accordance with cl.9.4.6.1.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-A\[G19179-A-002A.XLSX]Soil

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

G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		72434	72435	72436	72437	72438	72439
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS5	WS5	WS5	WS5	WS6	WS6
Client Sample Type		B	D	D	D	B	D
Client Sample Number		5	8	9	11	2	6
Depth - Top (m)		1.20	2.50	2.80	3.00	0.50	2.50
Depth - Bottom (m)		1.90	2.80	3.00	4.00	1.00	3.00
Date of Sampling		12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty sandy gravel	Brown slightly gravelly, slightly sandy, slightly silty clay	Brown silty clay with occasional gravel	Red clayey silty sand	Brown silty, sandy, clayey gravel	Brown slightly gravelly, slightly silty clay
Determinant	**Units**						
Moisture Content	(%)	9.0	29	26	22	9.9	31
Moisture Content Prep	-	3.2.3.3 (coarse)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.3 (coarse)	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	-	-	93	-	-	97
Liquid Limit	(%)	-	-	42	-	-	33
Plastic Limit	(%)	-	-	25	-	-	21
Plasticity Index	(%)	-	-	17	-	-	12
PI preparation	-	-	-	from its natural state	-	-	from its natural state
PI Test Method		-	-	clause 4.4 (one point)	-	-	clause 4.4 (one point)
Linear Shrinkage	(%)	-	-	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	100	-	-	100	100	-
90.0	(% Passing)	100	-	-	100	100	-
75.0	(% Passing)	100	-	-	100	100	-
63.0	(% Passing)	100	-	-	100	100	-
50.0	(% Passing)	100	-	-	100	100	-
37.5	(% Passing)	96	-	-	100	100	-
28.0	(% Passing)	91	-	-	100	93	-
20.0	(% Passing)	84	-	-	100	85	-
14.0	(% Passing)	74	-	-	100	74	-
10.0	(% Passing)	66	-	-	100	67	-
6.3	(% Passing)	59	-	-	100	60	-
5.0	(% Passing)	47	-	-	100	52	-
3.35	(% Passing)	38	-	-	99	42	-
2.00	(% Passing)	30	-	-	98	34	-
1.18	(% Passing)	24	-	-	91	30	-
0.600	(% Passing)	15	-	-	63	24	-
0.425	(% Passing)	12	-	-	48	19	-
0.300	(% Passing)	11	-	-	38	16	-
0.212	(% Passing)	11	-	-	34	15	-
0.150	(% Passing)	11	-	-	31	14	-
0.063	(% Passing)	11	-	-	29	13	-
0.02	(% Passing)	-	-	-	22	-	-
0.006	(% Passing)	-	-	-	11	-	-
0.002	(% Passing)	-	-	-	7	-	-
PSD test Method	-	9.2 Wet Sieve	-	-	9.2 Wet Sieve	9.2 Wet Sieve	-
Sedimentation was pretreated	-	-	-	-	No	-	-

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

G19179-A/002 - Amendment A

Project Reference - Boulton Moor D

Analytical Test Results - Soil

NC Reference		72440	72441	72442	72443	72444	72445
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS6	WS7	WS7	WS7	WS7	WS8
Client Sample Type		D	B	D	D	D	B
Client Sample Number		12	3	6	7	12	2
Depth - Top (m)		5.50	0.70	2.00	2.50	5.00	0.50
Depth - Bottom (m)		6.00	0.90	2.50	3.00	6.00	0.60
Date of Sampling		12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, slightly gravelly clay	Brown silty, sandy, clayey gravel	Brown silty, sandy, clayey gravel	Brown silty clay and mudstone	Red silty clay	Brown gravelly, slightly clayey, slightly sandy silt
Determinant	**Units**						
Moisture Content	(%)	33	19	16	20	29	15
Moisture Content Prep	-	3.2.3.2 (medium)	3.2.3.3 (coarse)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.3 (coarse)
Fines passing 425µm test sieve	(%)	97	-	-	65	97	-
Liquid Limit	(%)	40	-	-	29	33	-
Plastic Limit	(%)	26	-	-	16	21	-
Plasticity Index	(%)	14	-	-	13	12	-
PI preparation	-	from its natural state	-	-	by wet sieving	from its natural state	-
PI Test Method		clause 4.4 (one point)	-	-	clause 4.4 (one point)	clause 4.4 (one point)	-
Linear Shrinkage	(%)	-	-	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	-	100	100	-	100	-
90.0	(% Passing)	-	100	100	-	100	-
75.0	(% Passing)	-	100	100	-	100	-
63.0	(% Passing)	-	100	100	-	100	-
50.0	(% Passing)	-	100	100	-	100	-
37.5	(% Passing)	-	98	100	-	100	-
28.0	(% Passing)	-	92	89	-	100	-
20.0	(% Passing)	-	87	79	-	100	-
14.0	(% Passing)	-	83	69	-	100	-
10.0	(% Passing)	-	80	61	-	100	-
6.3	(% Passing)	-	73	54	-	100	-
5.0	(% Passing)	-	68	48	-	100	-
3.35	(% Passing)	-	63	41	-	100	-
2.00	(% Passing)	-	59	34	-	100	-
1.18	(% Passing)	-	56	30	-	99	-
0.600	(% Passing)	-	52	24	-	98	-
0.425	(% Passing)	-	48	20	-	97	-
0.300	(% Passing)	-	43	15	-	97	-
0.212	(% Passing)	-	37	12	-	97	-
0.150	(% Passing)	-	33	10	-	96	-
0.063	(% Passing)	-	27	9	-	91	-
0.02	(% Passing)	-	-	-	-	60	-
0.006	(% Passing)	-	-	-	-	31	-
0.002	(% Passing)	-	-	-	-	16	-
PSD test Method	-	-	9.2 Wet Sieve	9.2 Wet Sieve	-	9.2 Wet Sieve	-
Sedimentation was pretreated	-	-			-	No	-

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

G19179-A/002 - Amendment A

Project Reference - Boulton Moor D

Analytical Test Results - Soil

NC Reference		72446	72447	72448	72449	72450	72451
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS8	WS8	WS8	WS8	WS9	WS9
Client Sample Type		SD	D	D	SD	B	D
Client Sample Number		9	10	12	16	4	8
Depth - Top (m)		3.00	3.60	4.50	7.00	1.20	3.50
Depth - Bottom (m)		3.45	4.00	5.00	7.45	2.00	4.00
Date of Sampling		12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019	12/12/2019
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, slightly gravelly clay	Red silty gravelly sand	Brown silty, slightly gravelly clay	Brown silty clay	Brown gravelly, slightly clayey, slightly sandy silt	Brown silty mudstone and clay
Determinant	**Units**						
Moisture Content	(%)	21	16	17	18	13	32
Moisture Content Prep	-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.3 (coarse)	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	-	94	-	-	53	-
Liquid Limit	(%)	-	33	-	-	25	-
Plastic Limit	(%)	-	Non Plastic	-	-	15	-
Plasticity Index	(%)	-	Non Plastic	-	-	10	-
PI preparation	-	-	from its natural state	-	-	from its natural state	-
PI Test Method		-	clause 4.4 (one point)	-	-	clause 4.4 (one point)	-
Linear Shrinkage	(%)	-	4.8	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	-	100	-	-	-	-
90.0	(% Passing)	-	100	-	-	-	-
75.0	(% Passing)	-	100	-	-	-	-
63.0	(% Passing)	-	100	-	-	-	-
50.0	(% Passing)	-	100	-	-	-	-
37.5	(% Passing)	-	100	-	-	-	-
28.0	(% Passing)	-	100	-	-	-	-
20.0	(% Passing)	-	100	-	-	-	-
14.0	(% Passing)	-	100	-	-	-	-
10.0	(% Passing)	-	100	-	-	-	-
6.3	(% Passing)	-	100	-	-	-	-
5.0	(% Passing)	-	100	-	-	-	-
3.35	(% Passing)	-	100	-	-	-	-
2.00	(% Passing)	-	100	-	-	-	-
1.18	(% Passing)	-	100	-	-	-	-
0.600	(% Passing)	-	98	-	-	-	-
0.425	(% Passing)	-	94	-	-	-	-
0.300	(% Passing)	-	89	-	-	-	-
0.212	(% Passing)	-	86	-	-	-	-
0.150	(% Passing)	-	83	-	-	-	-
0.063	(% Passing)	-	77	-	-	-	-
0.02	(% Passing)	-	-	-	-	-	-
0.006	(% Passing)	-	-	-	-	-	-
0.002	(% Passing)	-	-	-	-	-	-
PSD test Method	-	-	9.2 Wet Sieve	-	-	-	-
Sedimentation was pretreated	-	-	-	-	-	-	-

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

G19179-A/002 - Amendment A

Project Reference - Boulton Moor D

Analytical Test Results - Soil

NC Reference		72452
Client Sample ID		-
Client Sample Location		WS9
Client Sample Type		D
Client Sample Number		12
Depth - Top (m)		5.00
Depth - Bottom (m)		5.50
Date of Sampling		12/12/2019
Sample type		Disturbed
Sample Description		Not Found
Determinant	**Units**	
Moisture Content	(%)	22
Moisture Content Prep	-	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	100
Liquid Limit	(%)	26
Plastic Limit	(%)	Non Plastic
Plasticity Index	(%)	Non Plastic
PI preparation	-	from its natural state
PI Test Method		clause 4.4 (one point)
Linear Shrinkage	(%)	5.0
BS Test Sieve (mm)		
125.0	(% Passing)	-
90.0	(% Passing)	-
75.0	(% Passing)	-
63.0	(% Passing)	-
50.0	(% Passing)	-
37.5	(% Passing)	-
28.0	(% Passing)	-
20.0	(% Passing)	-
14.0	(% Passing)	-
10.0	(% Passing)	-
6.3	(% Passing)	-
5.0	(% Passing)	-
3.35	(% Passing)	-
2.00	(% Passing)	-
1.18	(% Passing)	-
0.600	(% Passing)	-
0.425	(% Passing)	-
0.300	(% Passing)	-
0.212	(% Passing)	-
0.150	(% Passing)	-
0.063	(% Passing)	-
0.02	(% Passing)	-
0.006	(% Passing)	-
0.002	(% Passing)	-
PSD test Method	-	-
Sedimentation was pretreated	-	-

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

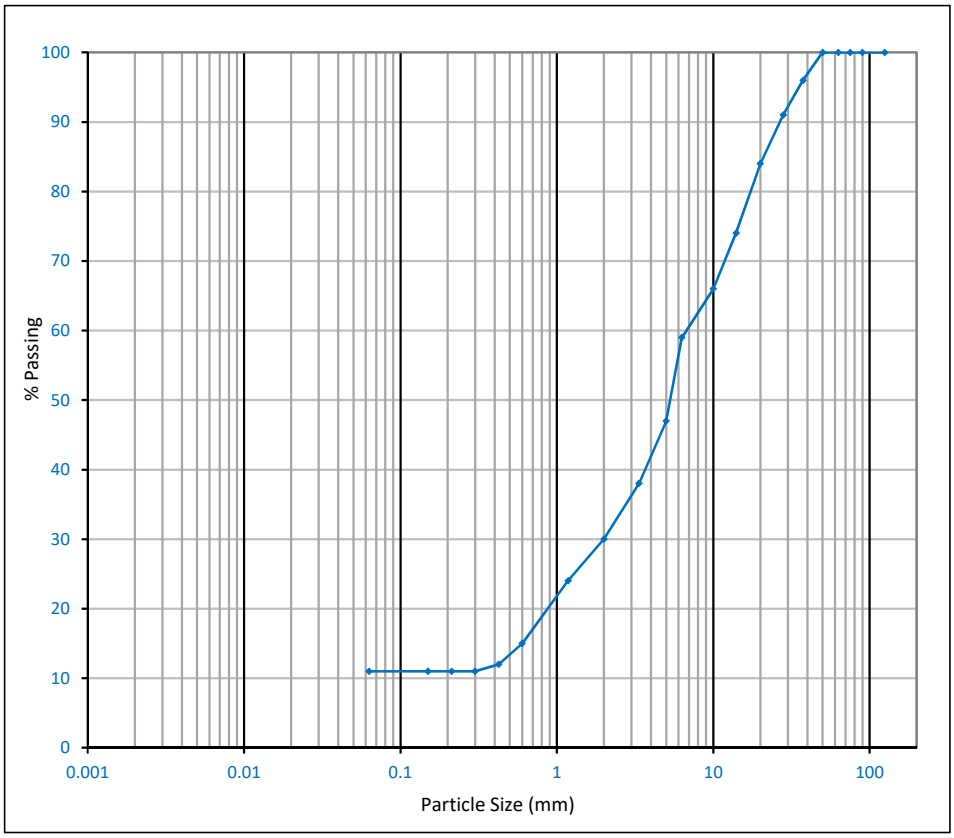
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72434**

Client Sample ID	-
Client Sample Location	WS5
Client Sample Type	B
Client Sample Number	5
Depth - Top (m)	1.20
Depth - Bottom (m)	1.90
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Brown silty sandy gravel



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	96	
28	91	
20	84	
14	74	
10	66	
6.3	59	
5	47	
3.35	38	62
2	30	Sand
1.18	24	
0.6	15	
0.425	12	
0.3	11	
0.212	11	
0.15	11	
0.063	11	27
		Fines 11

NOTES :

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

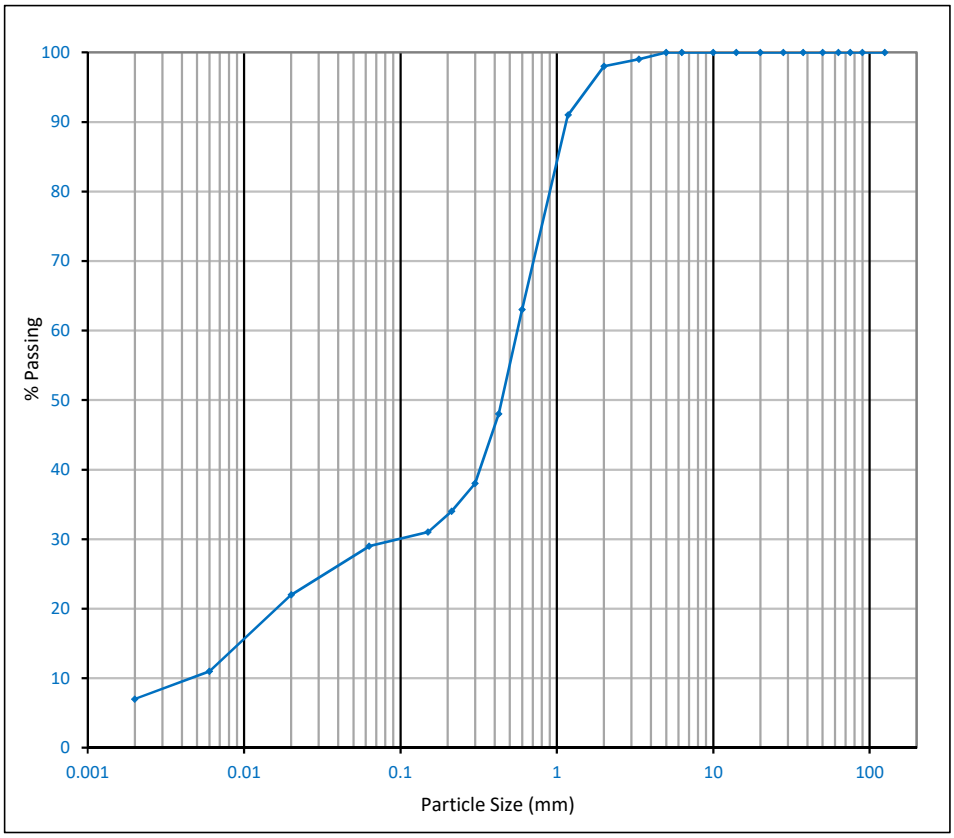
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72437**

Client Sample ID	-
Client Sample Location	WS5
Client Sample Type	D
Client Sample Number	11
Depth - Top (m)	3.00
Depth - Bottom (m)	4.00
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Red clayey silty sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	99	1
2	98	Sand
1.18	91	
0.6	63	
0.425	48	
0.3	38	
0.212	34	
0.15	31	
0.063	29	70
0.02	22	Silt
0.006	11	
0.002	7	22
		Clay 7

NOTES :

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

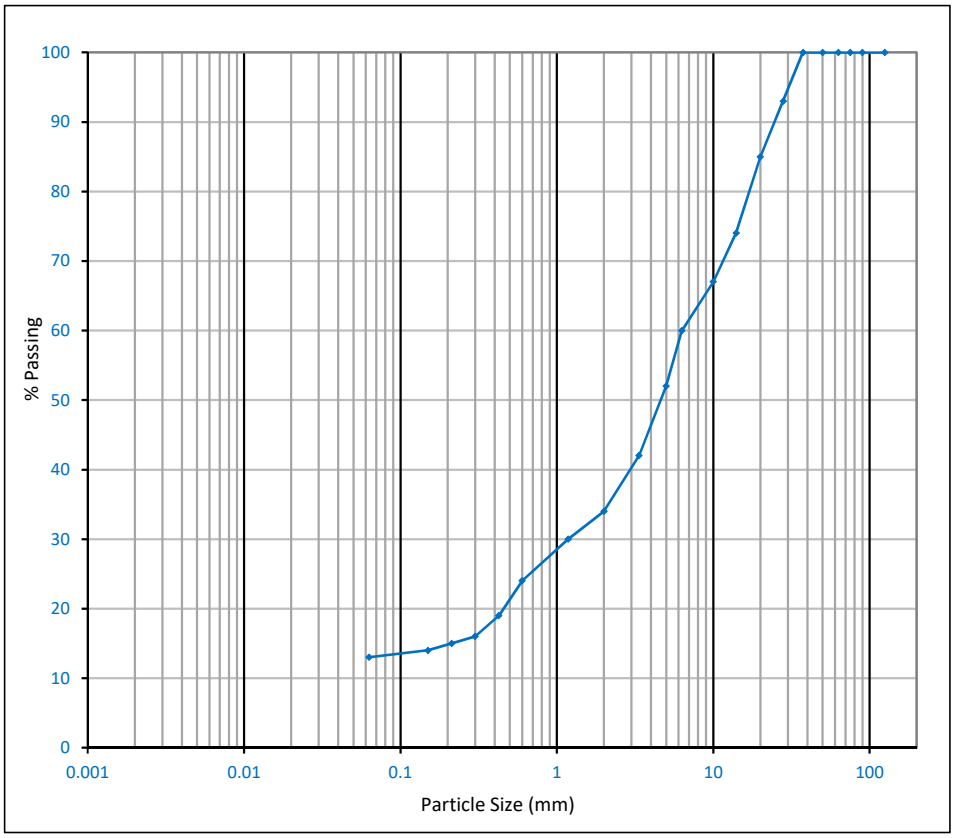
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72438**

Client Sample ID	-
Client Sample Location	WS6
Client Sample Type	B
Client Sample Number	2
Depth - Top (m)	0.50
Depth - Bottom (m)	1.00
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Brown silty, sandy, clayey gravel



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	93	
20	85	
14	74	
10	67	
6.3	60	
5	52	
3.35	42	58
2	34	Sand
1.18	30	
0.6	24	
0.425	19	
0.3	16	
0.212	15	
0.15	14	
0.063	13	29
		Fines 13

NOTES :

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

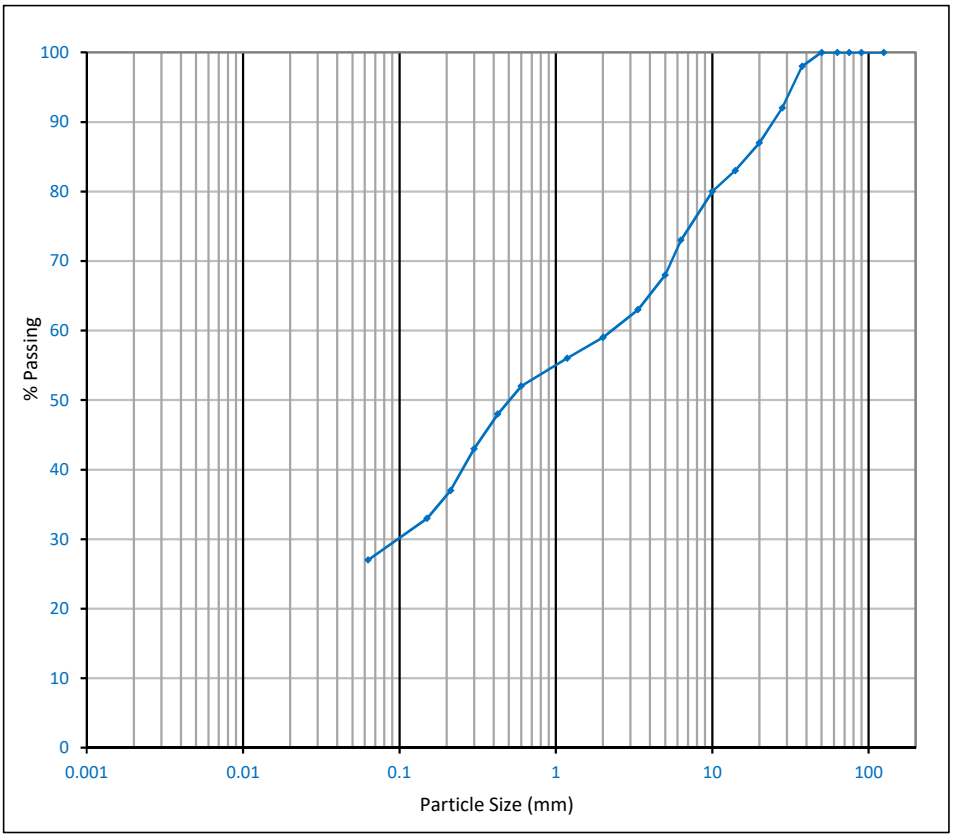
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72441**

Client Sample ID	-
Client Sample Location	WS7
Client Sample Type	B
Client Sample Number	3
Depth - Top (m)	0.70
Depth - Bottom (m)	0.90
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Brown silty, sandy, clayey gravel



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	98	
28	92	
20	87	
14	83	
10	80	
6.3	73	
5	68	
3.35	63	37
2	59	Sand
1.18	56	
0.6	52	
0.425	48	
0.3	43	
0.212	37	
0.15	33	
0.063	27	36
		Fines 27

NOTES :

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

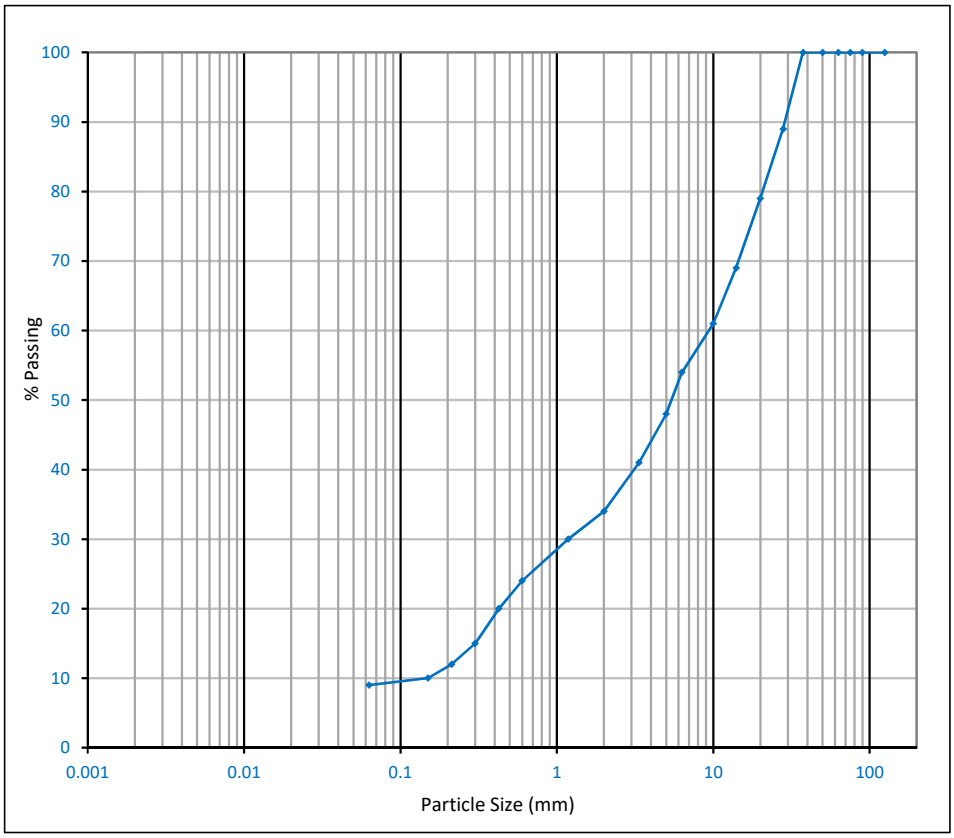
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72442**

Client Sample ID	-
Client Sample Location	WS7
Client Sample Type	D
Client Sample Number	6
Depth - Top (m)	2.00
Depth - Bottom (m)	2.50
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Brown silty, sandy, clayey gravel



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	89	
20	79	
14	69	
10	61	
6.3	54	
5	48	
3.35	41	59
2	34	Sand
1.18	30	
0.6	24	
0.425	20	
0.3	15	
0.212	12	
0.15	10	
0.063	9	32
		Fines 9

NOTES :

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

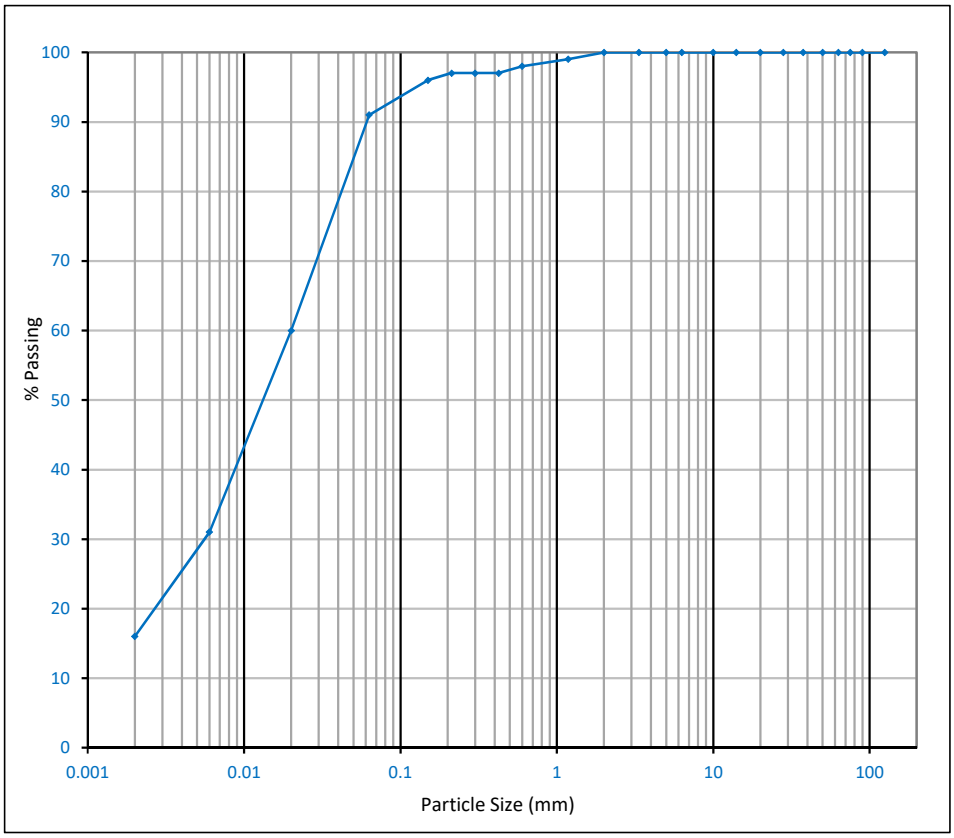
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72444**

Client Sample ID	-
Client Sample Location	WS7
Client Sample Type	D
Client Sample Number	12
Depth - Top (m)	5.00
Depth - Bottom (m)	6.00
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Red silty clay



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	100	0
2	100	Sand
1.18	99	
0.6	98	
0.425	97	
0.3	97	
0.212	97	
0.15	96	
0.063	91	9
0.02	60	Silt
0.006	31	
0.002	16	75
		Clay 16

NOTES :

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

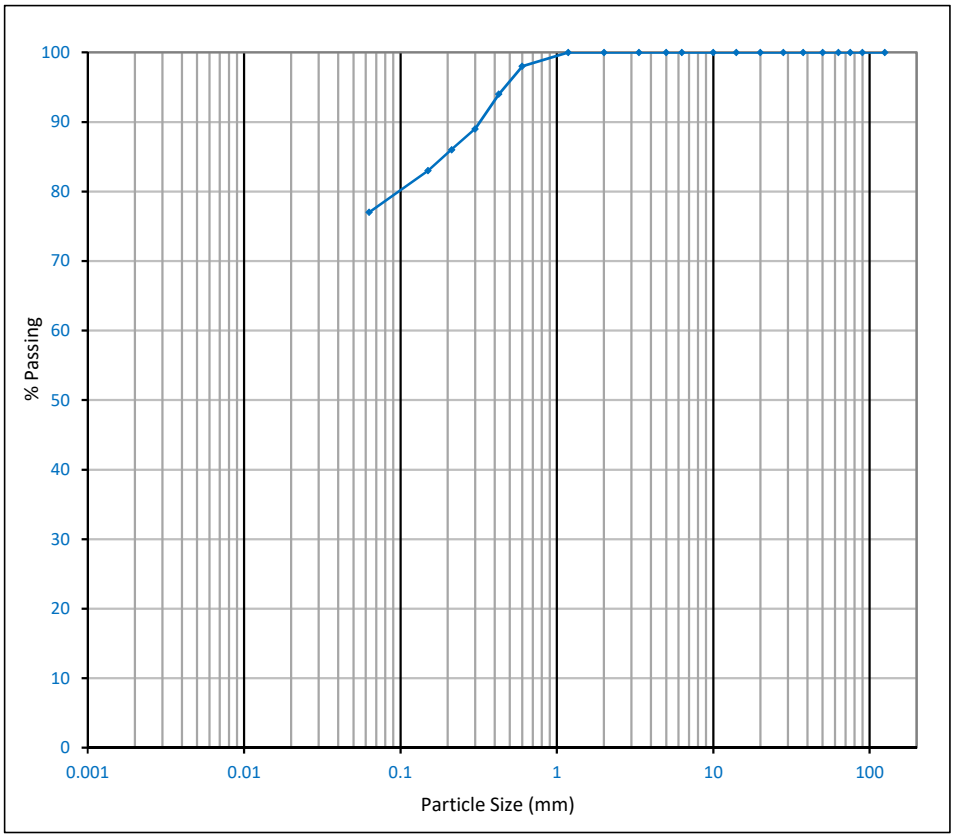
G19179-A/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**72447**

Client Sample ID	-
Client Sample Location	WS8
Client Sample Type	D
Client Sample Number	10
Depth - Top (m)	3.60
Depth - Bottom (m)	4.00
Date of Sampling	12/12/19
Sample type	Disturbed
Sample Description	Red silty gravelly sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	100	0
2	100	Sand
1.18	100	
0.6	98	
0.425	94	
0.3	89	
0.212	86	
0.15	83	
0.063	77	23
		Fines 77

NOTES :

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

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

Analytical Test Report: G19179-B/002 - Amendment A

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	05/02/2020
Your Order Number:	G19179-B	Testing Instruction Received:	05/02/2020
Report Issue Number:	2	Sample Tested:	05/02 to 28/02/2020
Samples Analysed:	24 soil samples	Report issued:	13/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were taken by NC.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Particle Size Distribution Sedimentation

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.4 sedimentation by pipette method.

The samples were not treated in accordance with cl.9.4.6.1.

1377 Determination of Undrained Shear Strength in Triaxial Compression

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS 1377: Part 7: 1990 clause 8, single stage loading.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-B\[G19179-B-002A.XLSX]Soil

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73788	73790	73792	73793	73794	73795
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH1	BH1	BH1	BH1	BH2	BH2
Client Sample Type		B	D	D	D	B	B
Client Sample Number		2	5	8	10	1	4
Depth - Top (m)		0.80	2.50	4.90	6.50	0.40	2.00
Depth - Bottom (m)		1.00	2.50	4.90	6.50	0.60	2.50
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, clayey, gravelly sand with occasional slag	Brown slightly silty clay	Brown slightly silty clay	Brown silty clay	Brown silty, clayey, gravelly sand	Brown sandy gravel
Determinant	**Units**						
Moisture Content	(%)	12	19	29	22	9.4	19
Moisture Content Prep	-	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	-	100	100	-	-	-
Liquid Limit	(%)	-	32	33	-	-	-
Plastic Limit	(%)	-	21	21	-	-	-
Plasticity Index	(%)	-	11	12	-	-	-
PI preparation	-	-	from its natural state	from its natural state	-	-	-
PI Test Method		-	clause 4.4 (one point)	clause 4.4 (one point)	-	-	-
Linear Shrinkage	(%)	-	-	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	100	-	-	-	100	100
90.0	(% Passing)	100	-	-	-	100	100
75.0	(% Passing)	100	-	-	-	100	100
63.0	(% Passing)	100	-	-	-	100	100
50.0	(% Passing)	100	-	-	-	100	100
37.5	(% Passing)	100	-	-	-	94	100
28.0	(% Passing)	100	-	-	-	91	100
20.0	(% Passing)	94	-	-	-	80	97
14.0	(% Passing)	89	-	-	-	75	95
10.0	(% Passing)	85	-	-	-	67	90
6.3	(% Passing)	79	-	-	-	60	82
5.0	(% Passing)	70	-	-	-	59	73
3.35	(% Passing)	63	-	-	-	56	54
2.00	(% Passing)	55	-	-	-	53	36
1.18	(% Passing)	50	-	-	-	49	25
0.600	(% Passing)	41	-	-	-	40	14
0.425	(% Passing)	38	-	-	-	34	9
0.300	(% Passing)	36	-	-	-	28	7
0.212	(% Passing)	35	-	-	-	23	6
0.150	(% Passing)	35	-	-	-	19	5
0.063	(% Passing)	34	-	-	-	14	4
0.02	(% Passing)	-	-	-	-	3	-
0.006	(% Passing)	-	-	-	-	2	-
0.002	(% Passing)	-	-	-	-	2	-
PSD test Method	-	9.2 Wet Sieve	-	-	-	9.2 Wet Sieve	9.2 Wet Sieve
Sedimentation was pretreated	-	-	-	-	-	No	-

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73788	73790	73792	73793	73794	73795
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH1	BH1	BH1	BH1	BH2	BH2
Client Sample Type		B	D	D	D	B	B
Client Sample Number		2	5	8	10	1	4
Depth - Top (m)		0.80	2.50	4.90	6.50	0.40	2.00
Depth - Bottom (m)		1.00	2.50	4.90	6.50	0.60	2.50
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, clayey, gravelly sand with occasional slag	Brown slightly silty clay	Brown slightly silty clay	Brown silty clay	Brown silty, clayey, gravelly sand	Brown sandy gravel
Determinant	**Units**						

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73796	73798	73799	73800	73801	73803
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH2	BH2	BH2	BH5	BH5	BH5
Client Sample Type		B	D	D	D	B	D
Client Sample Number		6	8	9	6	4	9
Depth - Top (m)		4.00	5.85	6.40	2.00	3.00	5.10
Depth - Bottom (m)		4.50	5.85	6.40	2.00	3.50	5.10
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown slightly silty clay	Brown silt	Brown slightly silty clay	Brown/grey silty, slightly sandy, gravelly clay	Brown silty clay	Brown silty clay
Determinant	**Units**						
Moisture Content	(%)	22	22	20	28	34	30
Moisture Content Prep	-	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)
Fines passing 425µm test sieve	(%)	100	100	-	-	100	100
Liquid Limit	(%)	26	32	-	-	43	33
Plastic Limit	(%)	18	Non Plastic	-	-	29	23
Plasticity Index	(%)	8	Non Plastic	-	-	14	10
PI preparation	-	from its natural state	from its natural state	-	-	from its natural state	from its natural state
PI Test Method		clause 4.4 (one point)	clause 4.4 (one point)	-	-	clause 4.4 (one point)	clause 4.4 (one point)
Linear Shrinkage	(%)	-	2.2	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	-	-	-	100	-	-
90.0	(% Passing)	-	-	-	100	-	-
75.0	(% Passing)	-	-	-	100	-	-
63.0	(% Passing)	-	-	-	100	-	-
50.0	(% Passing)	-	-	-	100	-	-
37.5	(% Passing)	-	-	-	100	-	-
28.0	(% Passing)	-	-	-	100	-	-
20.0	(% Passing)	-	-	-	100	-	-
14.0	(% Passing)	-	-	-	95	-	-
10.0	(% Passing)	-	-	-	94	-	-
6.3	(% Passing)	-	-	-	91	-	-
5.0	(% Passing)	-	-	-	90	-	-
3.35	(% Passing)	-	-	-	89	-	-
2.00	(% Passing)	-	-	-	87	-	-
1.18	(% Passing)	-	-	-	84	-	-
0.600	(% Passing)	-	-	-	76	-	-
0.425	(% Passing)	-	-	-	71	-	-
0.300	(% Passing)	-	-	-	66	-	-
0.212	(% Passing)	-	-	-	62	-	-
0.150	(% Passing)	-	-	-	58	-	-
0.063	(% Passing)	-	-	-	51	-	-
0.02	(% Passing)	-	-	-	-	-	-
0.006	(% Passing)	-	-	-	-	-	-
0.002	(% Passing)	-	-	-	-	-	-
PSD test Method	-	-	-	-	9.2 Wet Sieve	-	-
Sedimentation was pretreated	-	-	-	-	-	-	-

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73796	73798	73799	73800	73801	73803
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH2	BH2	BH2	BH5	BH5	BH5
Client Sample Type		B	D	D	D	B	D
Client Sample Number		6	8	9	6	4	9
Depth - Top (m)		4.00	5.85	6.40	2.00	3.00	5.10
Depth - Bottom (m)		4.50	5.85	6.40	2.00	3.50	5.10
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown slightly silty clay	Brown silt	Brown slightly silty clay	Brown/grey silty, slightly sandy, gravelly clay	Brown silty clay	Brown silty clay
Determinant	**Units**						

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73804	73805	73806	73807	73808	73809
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH5	BH5	BH6	BH6	BH6	BH6
Client Sample Type		D	D	B	D	B	D
Client Sample Number		11	13	3	6	11	12
Depth - Top (m)		6.00	7.00	0.80	2.00	5.00	6.20
Depth - Bottom (m)		6.00	7.00	1.00	2.50	5.50	6.20
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty clay	Brown silty clay	Brown silty, clayey, gravelly sand	Brown silty clay	Brown slightly silty clay	Brown silty gravel
Determinant	**Units**						
Moisture Content	(%)	28	19	14	29	19	12
Moisture Content Prep	-	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)
Fines passing 425µm test sieve	(%)	-	-	-	-	100	-
Liquid Limit	(%)	-	-	-	-	30	-
Plastic Limit	(%)	-	-	-	-	20	-
Plasticity Index	(%)	-	-	-	-	10	-
PI preparation	-	-	-	-	-	from its natural state	-
PI Test Method		-	-	-	-	clause 4.4 (one point)	-
Linear Shrinkage	(%)	-	-	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	-	-	100	-	-	-
90.0	(% Passing)	-	-	100	-	-	-
75.0	(% Passing)	-	-	100	-	-	-
63.0	(% Passing)	-	-	100	-	-	-
50.0	(% Passing)	-	-	100	-	-	-
37.5	(% Passing)	-	-	100	-	-	-
28.0	(% Passing)	-	-	99	-	-	-
20.0	(% Passing)	-	-	96	-	-	-
14.0	(% Passing)	-	-	88	-	-	-
10.0	(% Passing)	-	-	82	-	-	-
6.3	(% Passing)	-	-	75	-	-	-
5.0	(% Passing)	-	-	73	-	-	-
3.35	(% Passing)	-	-	71	-	-	-
2.00	(% Passing)	-	-	69	-	-	-
1.18	(% Passing)	-	-	65	-	-	-
0.600	(% Passing)	-	-	54	-	-	-
0.425	(% Passing)	-	-	47	-	-	-
0.300	(% Passing)	-	-	40	-	-	-
0.212	(% Passing)	-	-	33	-	-	-
0.150	(% Passing)	-	-	27	-	-	-
0.063	(% Passing)	-	-	21	-	-	-
0.02	(% Passing)	-	-	10	-	-	-
0.006	(% Passing)	-	-	8	-	-	-
0.002	(% Passing)	-	-	6	-	-	-
PSD test Method	-	-	-	9.2 Wet Sieve	-	-	-
Sedimentation was pretreated	-	-	-	No	-	-	-

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73804	73805	73806	73807	73808	73809
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH5	BH5	BH6	BH6	BH6	BH6
Client Sample Type		D	D	B	D	B	D
Client Sample Number		11	13	3	6	11	12
Depth - Top (m)		6.00	7.00	0.80	2.00	5.00	6.20
Depth - Bottom (m)		6.00	7.00	1.00	2.50	5.50	6.20
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty clay	Brown silty clay	Brown silty, clayey, gravelly sand	Brown silty clay	Brown slightly silty clay	Brown silty gravel
Determinant	**Units**						

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		73810	73811
Client Sample ID		-	-
Client Sample Location		TT1	TT2
Client Sample Type		D	D
Client Sample Number		5	4
Depth - Top (m)		2.50	2.00
Depth - Bottom (m)		2.50	2.00
Date of Sampling		12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed
Sample Description		Brown silty clay	Brown/grey silt
Determinant	**Units**		
Moisture Content	(%)	26	19
Moisture Content Prep	-	3.2.3.1 (fine)	3.2.3.1 (fine)
Fines passing 425µm test sieve	(%)	100	100
Liquid Limit	(%)	33	22
Plastic Limit	(%)	20	14
Plasticity Index	(%)	13	8
PI preparation	-	from its natural state	from its natural state
PI Test Method		clause 4.4 (one point)	clause 4.4 (one point)
Linear Shrinkage	(%)	-	-
BS Test Sieve (mm)			
125.0	(% Passing)	-	100
90.0	(% Passing)	-	100
75.0	(% Passing)	-	100
63.0	(% Passing)	-	100
50.0	(% Passing)	-	100
37.5	(% Passing)	-	100
28.0	(% Passing)	-	100
20.0	(% Passing)	-	100
14.0	(% Passing)	-	100
10.0	(% Passing)	-	100
6.3	(% Passing)	-	100
5.0	(% Passing)	-	100
3.35	(% Passing)	-	99
2.00	(% Passing)	-	98
1.18	(% Passing)	-	94
0.600	(% Passing)	-	88
0.425	(% Passing)	-	85
0.300	(% Passing)	-	81
0.212	(% Passing)	-	76
0.150	(% Passing)	-	68
0.063	(% Passing)	-	54
0.02	(% Passing)	-	40
0.006	(% Passing)	-	23
0.002	(% Passing)	-	14
PSD test Method	-	-	9.2 Wet Sieve
Sedimentation was pretreated	-	-	No

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference	73810	73811
Client Sample ID	-	-
Client Sample Location	TT1	TT2
Client Sample Type	D	D
Client Sample Number	5	4
Depth - Top (m)	2.50	2.00
Depth - Bottom (m)	2.50	2.00
Date of Sampling	12/12/2020	12/12/2020
Sample type	Disturbed	Disturbed
Sample Description	Brown silty clay	Brown/grey silt

Determinant	Units

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

G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Analytical Test Results -
Triaxial (Multi Stage)

NC Reference		73789	73791	73797	73802
Client Sample ID		-	-	-	-
Client Sample Location		BH1	BH1	BH2	BH5
Client Sample Type		UT	UT	UT	UT
Client Sample Number		1	2	1	1
Depth - Top (m)		2.00	4.00	5.40	4.00
Depth - Bottom (m)		2.45	4.45	5.85	4.45
Date of Sampling		12/12/2020	12/12/2020	12/12/2020	12/12/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown slightly sandy, clayey silt	Brown slightly sandy, clayey silt	Brown slightly sandy, clayey silt	Brown clayey silt
Determinant	**Units**				
Preperation Method		Undisturbed	Undisturbed	Undisturbed	Undisturbed
Orientation within original sample		Vertical	Vertical	Vertical	Vertical
Depth within original sample	mm	100	20	50	50
Initial Properties					
Sample height	mm	208	208	208	208
Sample width	mm	103	103	103	103
Moisture content	%	27	26	32	31
Bulk density	Mg/m^3	2.17	2.02	2.06	1.96
Dry density	Mg/m^3	1.71	1.61	1.56	1.50
Rate of strain	%/min	0.77	0.84	0.84	0.79
Type of membrane	-	Latex	Latex	Latex	Latex
Membrane thickness	mm	0.34	0.34	0.34	0.34
Test Data					
Cell pressure	kPa	50	75	100	75
Maximum deviator stress	kPa	128	75.9	59.8	96.7
Membrane correction	kPa	0.9	0.0	0.9	0.9
Corrected maximum deviator stress	kPa	127	76	59	96
Cumulative strain at failure	%	8	11	12	11
Mode of failure	-	plastic	plastic	plastic	plastic
Shear strength (c_u)	**kPa**	**63**	**38**	**30**	**48**
Cell pressure	kPa	100	150	150	150
Maximum deviator stress	kPa	160	96.8	63.8	112
Membrane correction	kPa	0.9	0.0	0.9	0.9
Corrected maximum deviator stress	kPa	159	97	63	111
Cumulative strain at failure	%	10	13	13	12
Mode of failure	-	plastic	plastic	plastic	plastic
Shear strength (c_u)	**kPa**	**80**	**48**	**32**	**56**
Cell pressure	kPa	150	225	200	225
Maximum deviator stress	kPa	187	120	72.7	126
Membrane correction	kPa	0.9	0.0	0.9	0.9
Corrected maximum deviator stress	kPa	187	120	72	125
Cumulative strain at failure	%	16	20	20	18
Mode of failure	-	plastic	plastic	plastic	plastic
Shear strength (c_u)	**kPa**	**93**	**60**	**36**	**62**

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

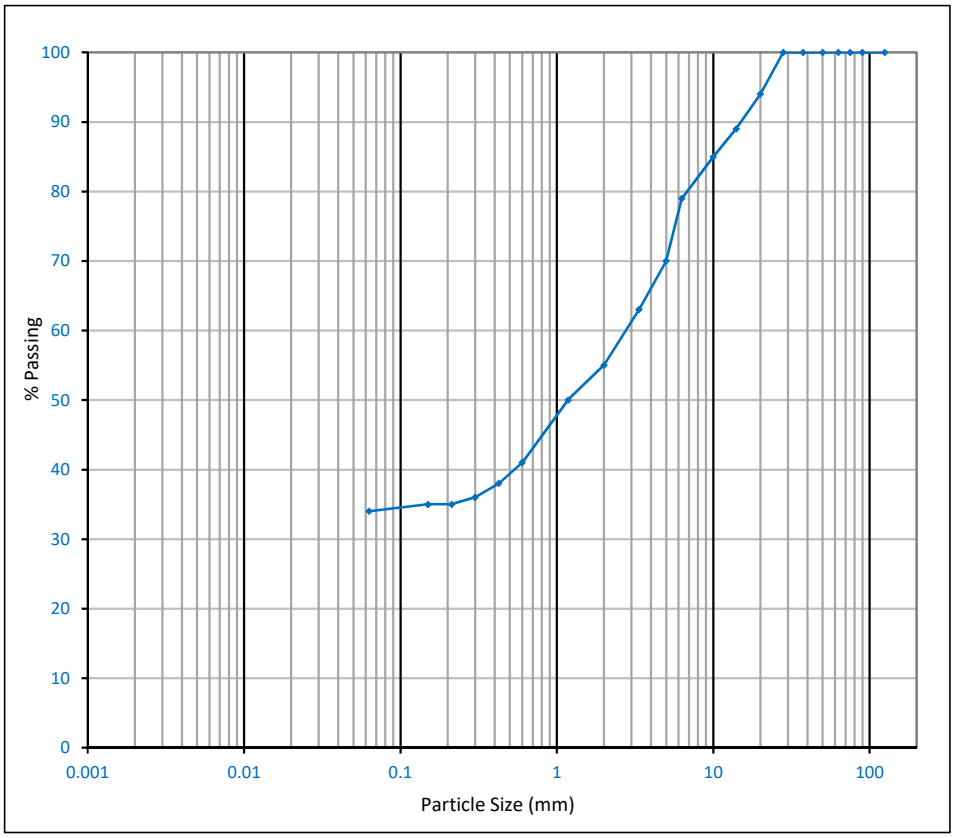
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73788**

Client Sample ID	-
Client Sample Location	BH1
Client Sample Type	B
Client Sample Number	2
Depth - Top (m)	0.80
Depth - Bottom (m)	1.00
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown silty, clayey, gravelly sand with occasional slag



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	94	
14	89	
10	85	
6.3	79	
5	70	
3.35	63	37
2	55	Sand
1.18	50	
0.6	41	
0.425	38	
0.3	36	
0.212	35	
0.15	35	
0.063	34	29
		Fines 34

NOTES :

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

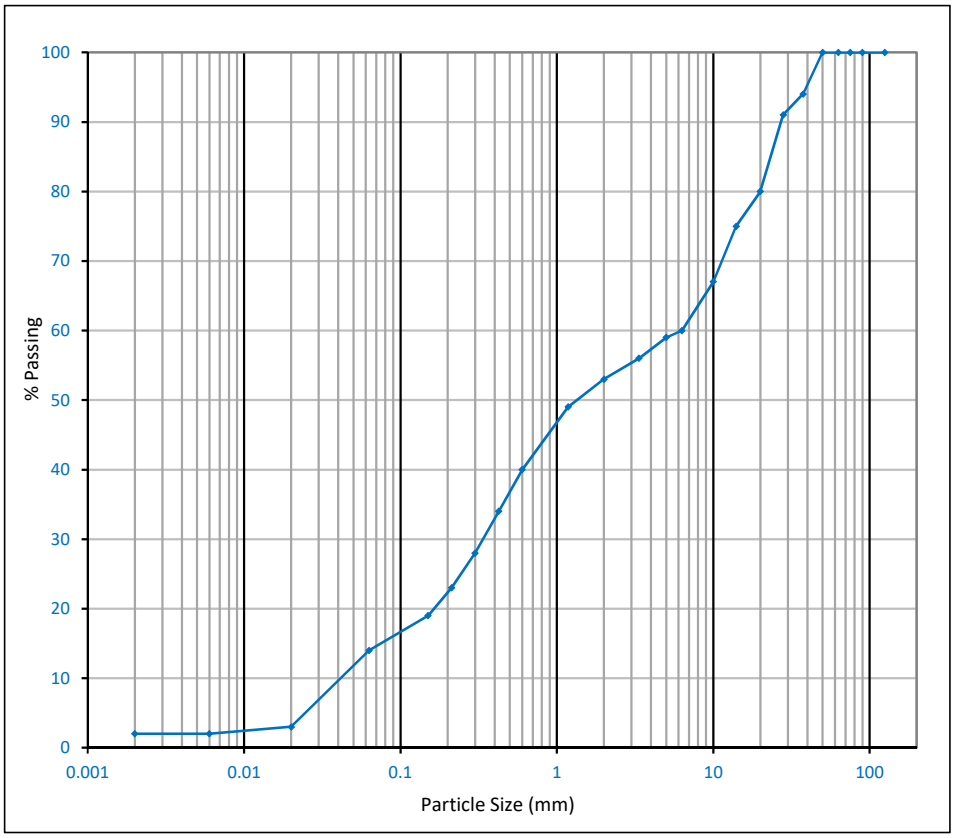
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73794**

Client Sample ID	-
Client Sample Location	BH2
Client Sample Type	B
Client Sample Number	1
Depth - Top (m)	0.40
Depth - Bottom (m)	0.60
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown silty, clayey, gravelly sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	94	
28	91	
20	80	
14	75	
10	67	
6.3	60	
5	59	
3.35	56	44
2	53	Sand
1.18	49	
0.6	40	
0.425	34	
0.3	28	
0.212	23	
0.15	19	
0.063	14	42
0.02	3	Silt
0.006	2	
0.002	2	12
		Clay 2

NOTES :

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

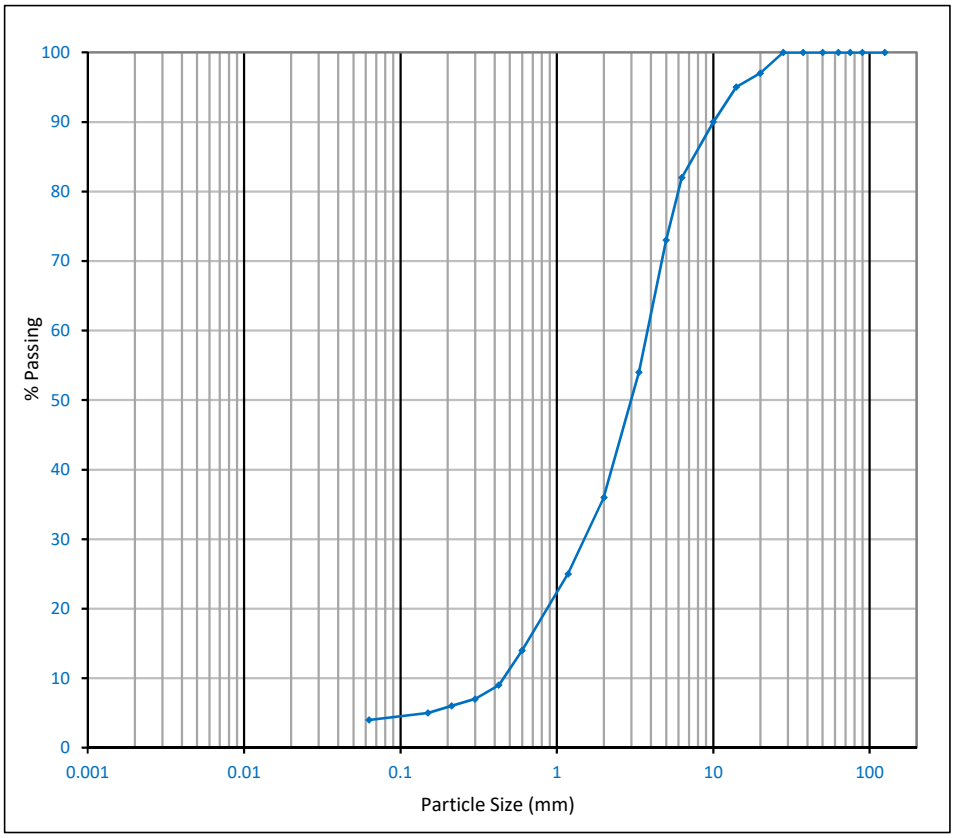
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73795**

Client Sample ID	-
Client Sample Location	BH2
Client Sample Type	B
Client Sample Number	4
Depth - Top (m)	2.00
Depth - Bottom (m)	2.50
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown sandy gravel



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	97	
14	95	
10	90	
6.3	82	
5	73	
3.35	54	46
2	36	Sand
1.18	25	
0.6	14	
0.425	9	
0.3	7	
0.212	6	
0.15	5	
0.063	4	50
		Fines 4

NOTES :

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

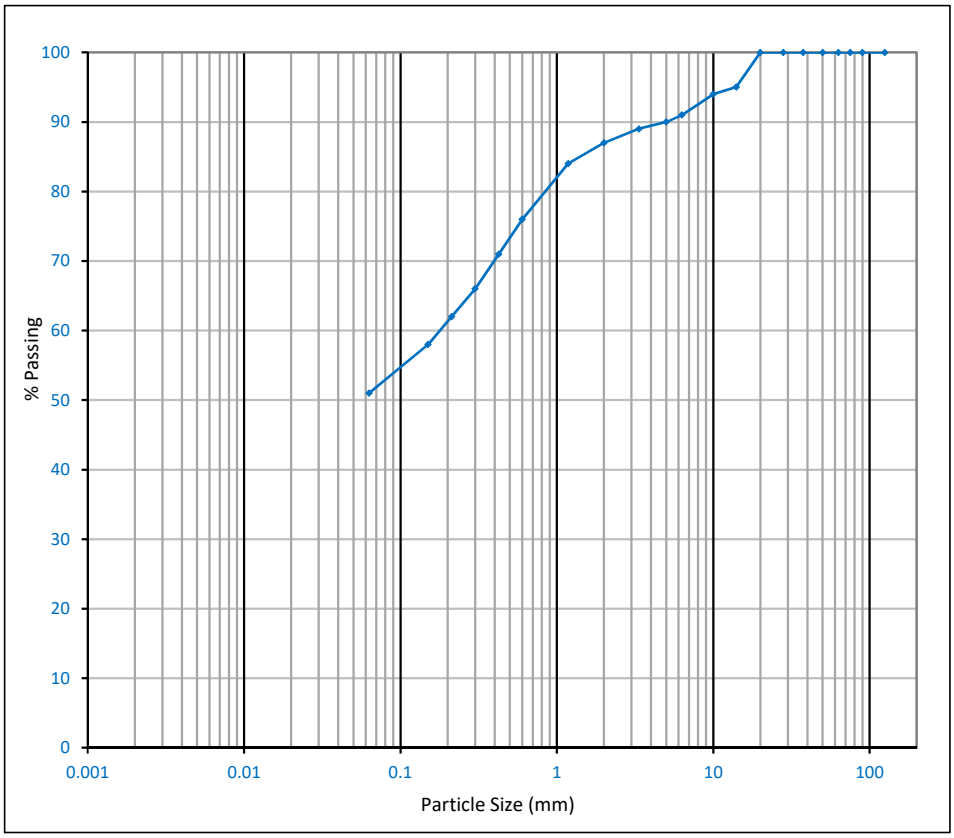
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73800**

Client Sample ID	-
Client Sample Location	BH5
Client Sample Type	D
Client Sample Number	6
Depth - Top (m)	2.00
Depth - Bottom (m)	2.00
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown/grey silty, slightly sandy, gravelly clay



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	95	
10	94	
6.3	91	
5	90	
3.35	89	11
2	87	Sand
1.18	84	
0.6	76	
0.425	71	
0.3	66	
0.212	62	
0.15	58	
0.063	51	38
		Fines 51

NOTES :

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

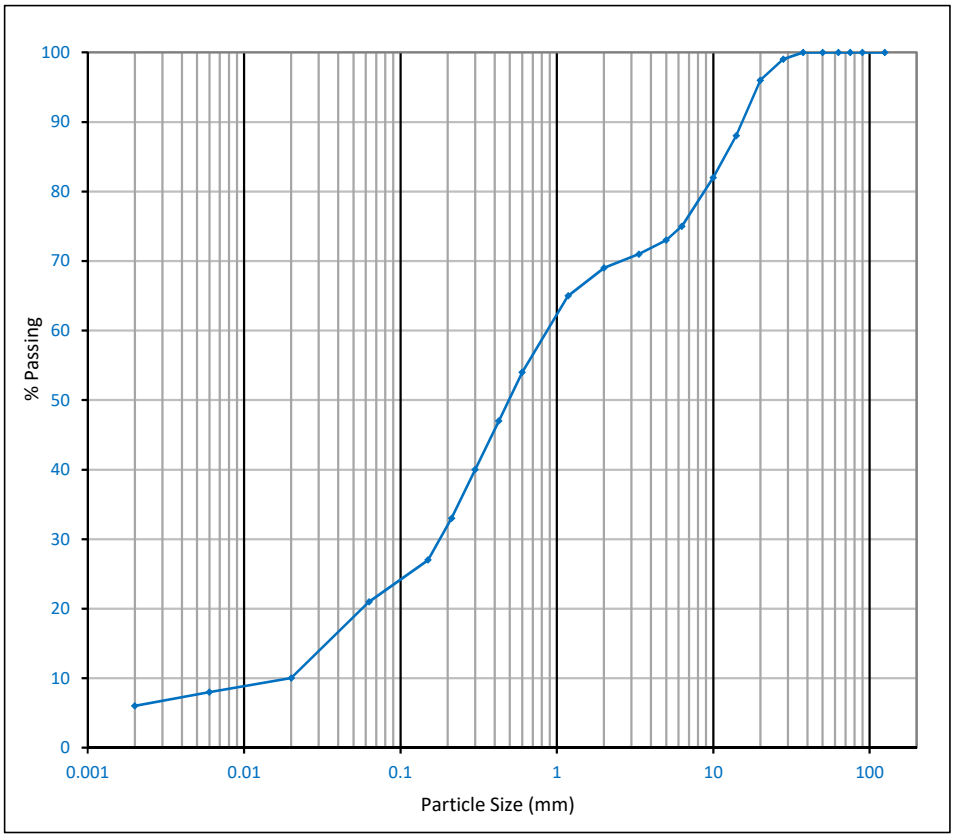
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73806**

Client Sample ID	-
Client Sample Location	BH6
Client Sample Type	B
Client Sample Number	3
Depth - Top (m)	0.80
Depth - Bottom (m)	1.00
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown silty, clayey, gravelly sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	99	
20	96	
14	88	
10	82	
6.3	75	
5	73	
3.35	71	29
2	69	Sand
1.18	65	
0.6	54	
0.425	47	
0.3	40	
0.212	33	
0.15	27	
0.063	21	50
0.02	10	Silt
0.006	8	
0.002	6	15
		Clay 6

NOTES :

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

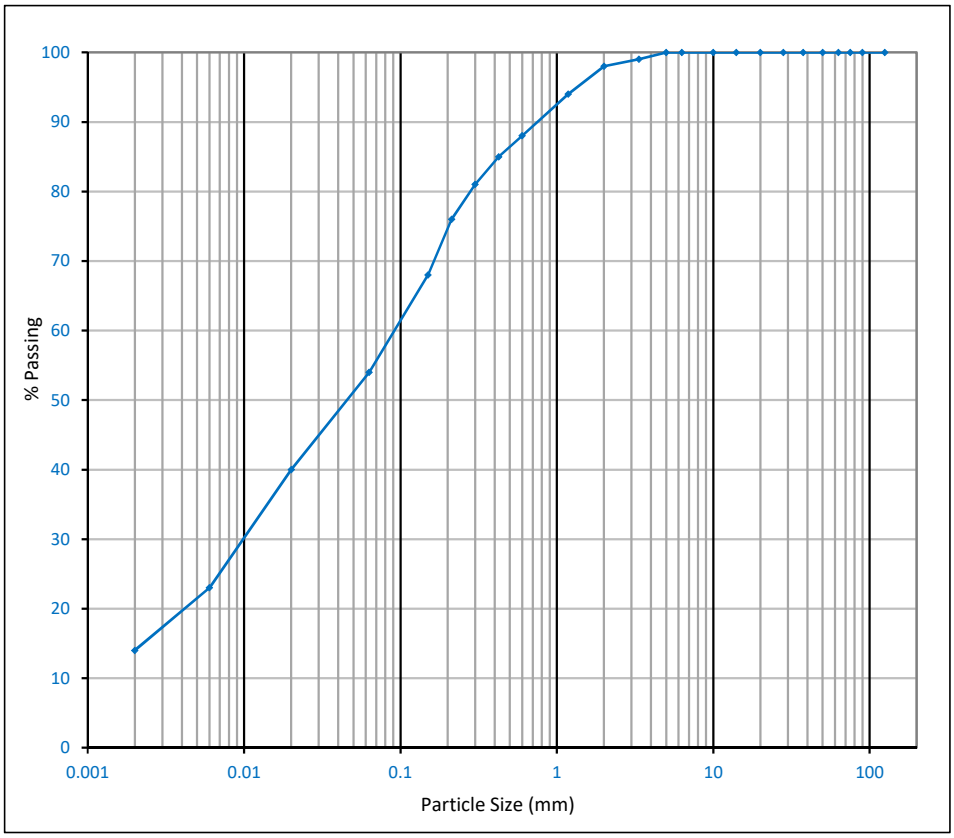
G19179-B/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**73811**

Client Sample ID	-
Client Sample Location	TT2
Client Sample Type	D
Client Sample Number	4
Depth - Top (m)	2.00
Depth - Bottom (m)	2.00
Date of Sampling	12/12/20
Sample type	Disturbed
Sample Description	Brown/grey silt



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	100	
6.3	100	
5	100	
3.35	99	1
2	98	Sand
1.18	94	
0.6	88	
0.425	85	
0.3	81	
0.212	76	
0.15	68	
0.063	54	45
0.02	40	Silt
0.006	23	
0.002	14	40
		Clay 14

NOTES :

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

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

Analytical Test Report: G19179-C/002 - Amendment A

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	24/02/2020
Your Order Number:	G19179	Testing Instruction Received:	24/02/2020
Report Issue Number:	2	Sample Tested:	24/02 to 17/03/2020
Samples Analysed:	12 soil samples	Report issued:	13/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-C\[G19179-C-002A.XLSX]Soil

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

G19179-C/002 - Amendment A

Project Reference -
Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		78386	78387	78388	78389	78390	78391
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS11	WS11	WS11	WS11	WS12	WS12
Client Sample Type		D	D	D	D	B	B
Client Sample Number		4	8	11	16	3	10
Depth - Top (m)		1.00	2.30	3.00	5.00	0.60	3.00
Depth - Bottom (m)		1.00	2.70	4.00	6.00	0.80	4.00
Date of Sampling		11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, gravelly clay	Brown slightly silty, gravelly clay	Brown sandy, slightly gravelly silt	Brown clayey, slightly gravelly silt	Brown silty, gravelly, clayey sand	Brown silty, slightly gravelly clay
Determinant	**Units**						
Moisture Content	(%)	16	18	13	20	8.1	14
Moisture Content Prep	-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.3 (coarse)	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	97	94	96	-	-	97
Liquid Limit	(%)	36	27	20	-	-	31
Plastic Limit	(%)	17	15	Non Plastic	-	-	14
Plasticity Index	(%)	19	12	Non Plastic	-	-	17
PI preparation	-	from its natural state	from its natural state	from its natural state	-	-	from its natural state
PI Test Method		clause 4.4 (one point)	clause 4.4 (one point)	clause 4.4 (one point)	-	-	clause 4.4 (one point)
Linear Shrinkage	(%)	-	-	4.5	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	-	-	-	-	100	-
90.0	(% Passing)	-	-	-	-	100	-
75.0	(% Passing)	-	-	-	-	100	-
63.0	(% Passing)	-	-	-	-	91	-
50.0	(% Passing)	-	-	-	-	87	-
37.5	(% Passing)	-	-	-	-	84	-
28.0	(% Passing)	-	-	-	-	82	-
20.0	(% Passing)	-	-	-	-	76	-
14.0	(% Passing)	-	-	-	-	68	-
10.0	(% Passing)	-	-	-	-	63	-
6.3	(% Passing)	-	-	-	-	58	-
5.0	(% Passing)	-	-	-	-	56	-
3.35	(% Passing)	-	-	-	-	53	-
2.00	(% Passing)	-	-	-	-	50	-
1.18	(% Passing)	-	-	-	-	46	-
0.600	(% Passing)	-	-	-	-	39	-
0.425	(% Passing)	-	-	-	-	33	-
0.300	(% Passing)	-	-	-	-	26	-
0.212	(% Passing)	-	-	-	-	21	-
0.150	(% Passing)	-	-	-	-	17	-
0.063	(% Passing)	-	-	-	-	11	-
0.02	(% Passing)	-	-	-	-	-	-
0.006	(% Passing)	-	-	-	-	-	-
0.002	(% Passing)	-	-	-	-	-	-
PSD test Method	-	-	-	-	-	9.2 Wet Sieve	-

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

G19179-C/002 - Amendment A

Project Reference -
Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		78386	78387	78388	78389	78390	78391
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS11	WS11	WS11	WS11	WS12	WS12
Client Sample Type		D	D	D	D	B	B
Client Sample Number		4	8	11	16	3	10
Depth - Top (m)		1.00	2.30	3.00	5.00	0.60	3.00
Depth - Bottom (m)		1.00	2.70	4.00	6.00	0.80	4.00
Date of Sampling		11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty, gravelly clay	Brown slightly silty, gravelly clay	Brown sandy, slightly gravelly silt	Brown clayey, slightly gravelly silt	Brown silty, gravelly, clayey sand	Brown silty, slightly gravelly clay
Determinant	**Units**						
Sedimentation was pretreated	-	-	-	-	-	-	-

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

G19179-C/002 - Amendment A

Project Reference -
Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		78392	78393	78394	78395	78396	78397
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS12	WS12	WS13	WS13	WS13	WS13
Client Sample Type		D	D	B	B	D	SD
Client Sample Number		12	14	4	7	9	10
Depth - Top (m)		4.50	5.50	1.10	3.00	3.70	4.00
Depth - Bottom (m)		4.80	6.00	2.00	3.70	4.00	4.45
Date of Sampling		11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Dark brown, gravelly clay with occasional crushed rock	Brown silty, slightly gravelly clay	Light brown silty, sandy, gravelly clay	Brown silty, sandy gravel	Brown silty, slightly gravelly clay	Brown silty, slightly gravelly clay
Determinant	**Units**						
Moisture Content	(%)	13	11	13	8.0	17	13
Moisture Content Prep	-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.3 (coarse)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)
Fines passing 425µm test sieve	(%)	-	98	-	-	98	-
Liquid Limit	(%)	-	26	-	-	29	-
Plastic Limit	(%)	-	13	-	-	13	-
Plasticity Index	(%)	-	13	-	-	16	-
PI preparation	-	-	from its natural state	-	-	from its natural state	-
PI Test Method		-	clause 4.4 (one point)	-	-	clause 4.4 (one point)	-
Linear Shrinkage	(%)	-	-	-	-	-	-
BS Test Sieve (mm)							
125.0	(% Passing)	100	-	100	100	-	-
90.0	(% Passing)	100	-	100	100	-	-
75.0	(% Passing)	100	-	100	100	-	-
63.0	(% Passing)	100	-	100	100	-	-
50.0	(% Passing)	100	-	93	100	-	-
37.5	(% Passing)	100	-	91	100	-	-
28.0	(% Passing)	100	-	86	97	-	-
20.0	(% Passing)	100	-	79	90	-	-
14.0	(% Passing)	100	-	68	77	-	-
10.0	(% Passing)	99	-	65	69	-	-
6.3	(% Passing)	98	-	58	57	-	-
5.0	(% Passing)	98	-	53	51	-	-
3.35	(% Passing)	97	-	45	44	-	-
2.00	(% Passing)	95	-	38	37	-	-
1.18	(% Passing)	93	-	32	30	-	-
0.600	(% Passing)	91	-	24	19	-	-
0.425	(% Passing)	89	-	20	12	-	-
0.300	(% Passing)	84	-	18	8	-	-
0.212	(% Passing)	79	-	17	7	-	-
0.150	(% Passing)	74	-	16	5	-	-
0.063	(% Passing)	67	-	14	4	-	-
0.02	(% Passing)	48	-	-	-	-	-
0.006	(% Passing)	31	-	-	-	-	-
0.002	(% Passing)	21	-	-	-	-	-
PSD test Method	-	9.2 Wet Sieve	-	9.2 Wet Sieve	9.2 Wet Sieve	-	-

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

G19179-C/002 - Amendment A

Project Reference -
Boulton Moor Derby

Analytical Test Results - Soil

NC Reference		78392	78393	78394	78395	78396	78397
Client Sample ID		-	-	-	-	-	-
Client Sample Location		WS12	WS12	WS13	WS13	WS13	WS13
Client Sample Type		D	D	B	B	D	SD
Client Sample Number		12	14	4	7	9	10
Depth - Top (m)		4.50	5.50	1.10	3.00	3.70	4.00
Depth - Bottom (m)		4.80	6.00	2.00	3.70	4.00	4.45
Date of Sampling		11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Dark brown, gravelly clay with occasional crushed rock	Brown silty, slightly gravelly clay	Light brown silty, sandy, gravelly clay	Brown silty, sandy gravel	Brown silty, slightly gravelly clay	Brown silty, slightly gravelly clay
Determinant	**Units**						
Sedimentation was pretreated	-	No	-	-	-	-	-

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

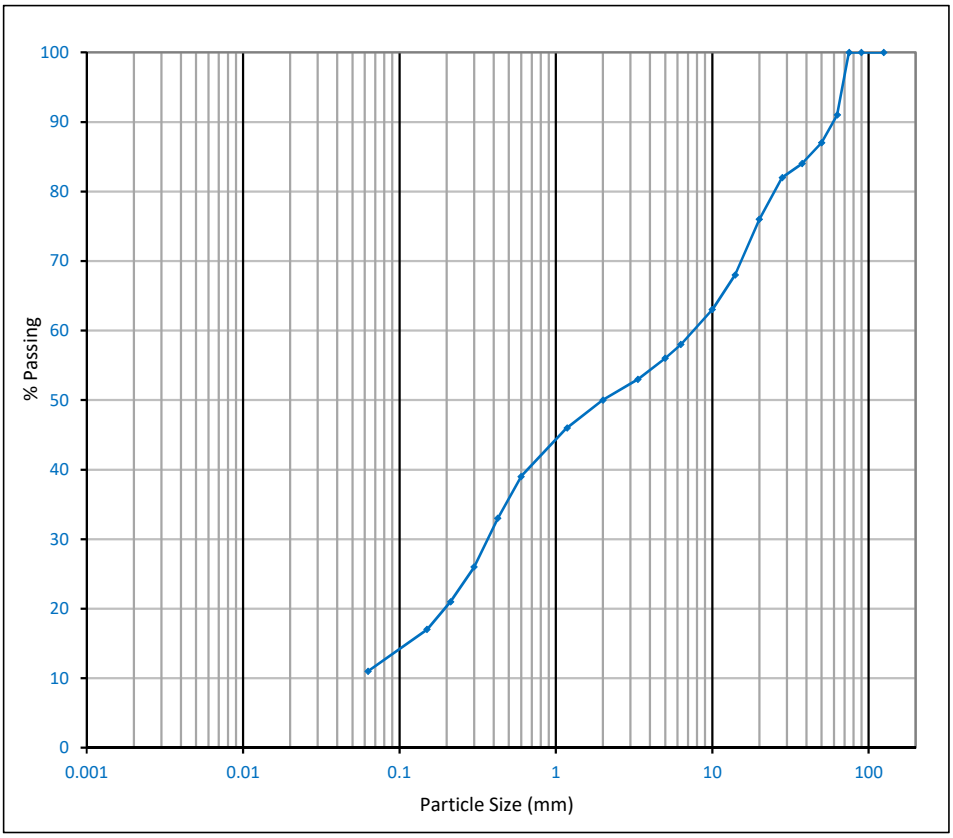
G19179-C/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**78390**

Client Sample ID	-
Client Sample Location	WS12
Client Sample Type	B
Client Sample Number	3
Depth - Top (m)	0.60
Depth - Bottom (m)	0.80
Date of Sampling	02/11/20
Sample type	Disturbed
Sample Description	Brown silty, gravelly, clayey sand



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	91	9
50	87	Gravel
37.5	84	
28	82	
20	76	
14	68	
10	63	
6.3	58	
5	56	
3.35	53	38
2	50	Sand
1.18	46	
0.6	39	
0.425	33	
0.3	26	
0.212	21	
0.15	17	
0.063	11	42
		Fines 11

NOTES :

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

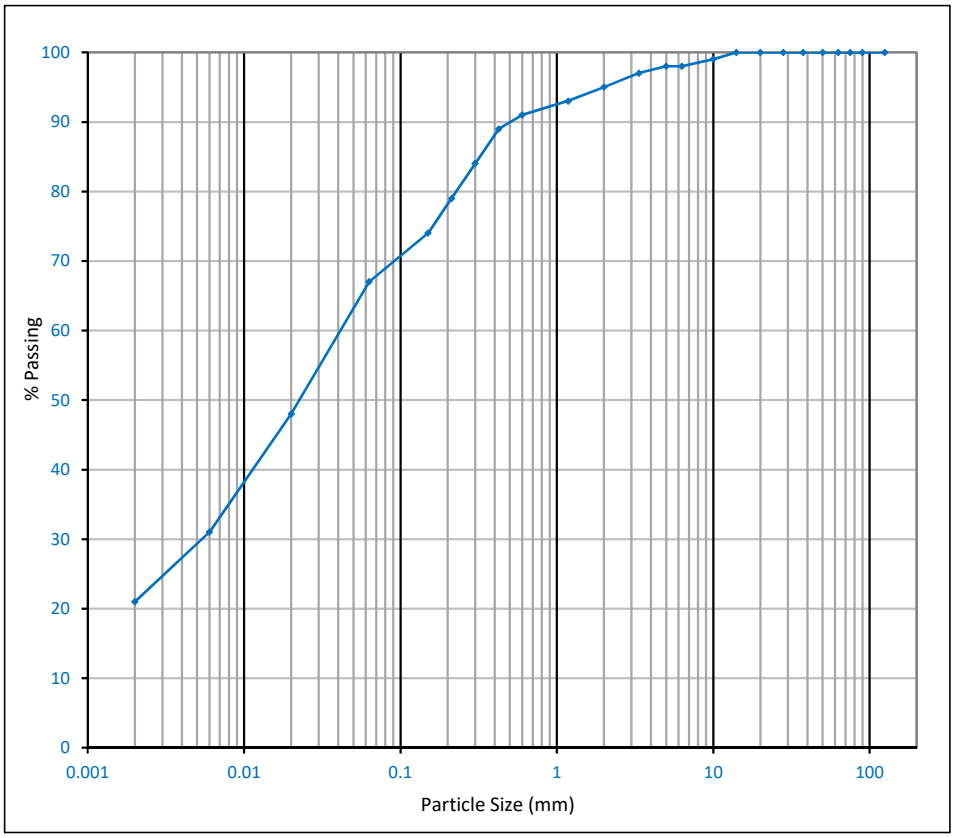
G19179-C/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**78392**

Client Sample ID	-
Client Sample Location	WS12
Client Sample Type	D
Client Sample Number	12
Depth - Top (m)	4.50
Depth - Bottom (m)	4.80
Date of Sampling	02/11/20
Sample type	Disturbed
Sample Description	Dark brown, gravelly clay with occasional crushed rock



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	99	
6.3	98	
5	98	
3.35	97	3
2	95	Sand
1.18	93	
0.6	91	
0.425	89	
0.3	84	
0.212	79	
0.15	74	
0.063	67	30
0.02	48	Silt
0.006	31	
0.002	21	46
		Clay 21

NOTES :

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

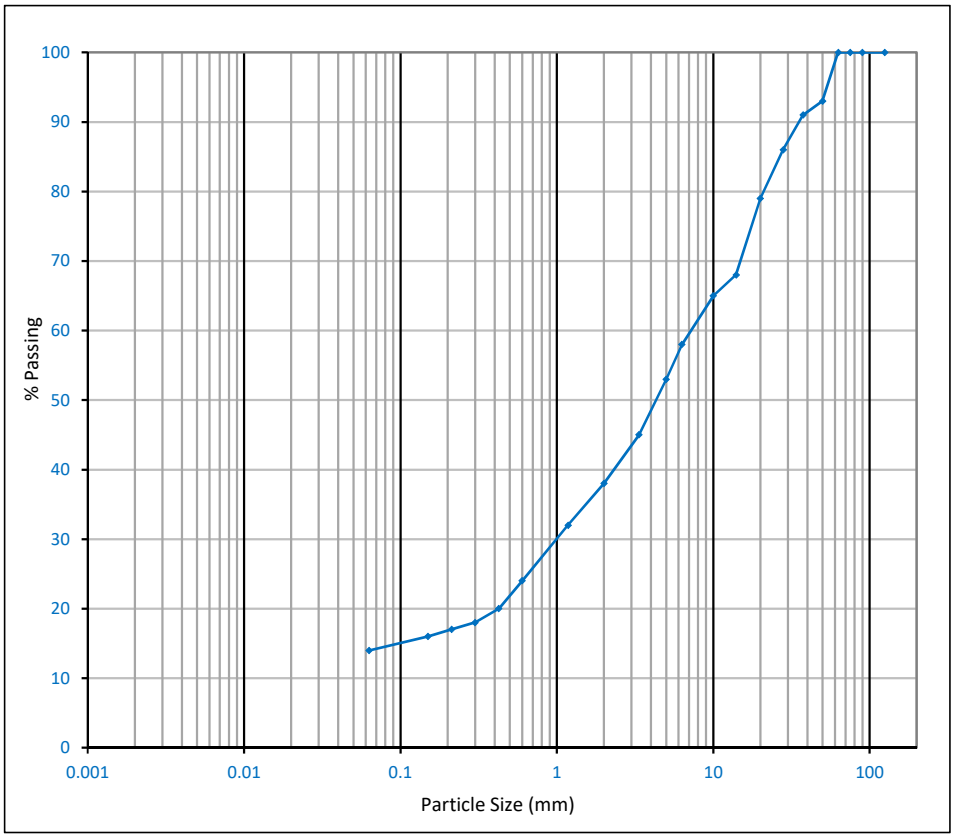
G19179-C/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**78394**

Client Sample ID	-
Client Sample Location	WS13
Client Sample Type	B
Client Sample Number	4
Depth - Top (m)	1.10
Depth - Bottom (m)	2.00
Date of Sampling	02/11/20
Sample type	Disturbed
Sample Description	Light brown silty, sandy, gravelly clay



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	93	Gravel
37.5	91	
28	86	
20	79	
14	68	
10	65	
6.3	58	
5	53	
3.35	45	55
2	38	Sand
1.18	32	
0.6	24	
0.425	20	
0.3	18	
0.212	17	
0.15	16	
0.063	14	31
		Fines 14

NOTES :

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

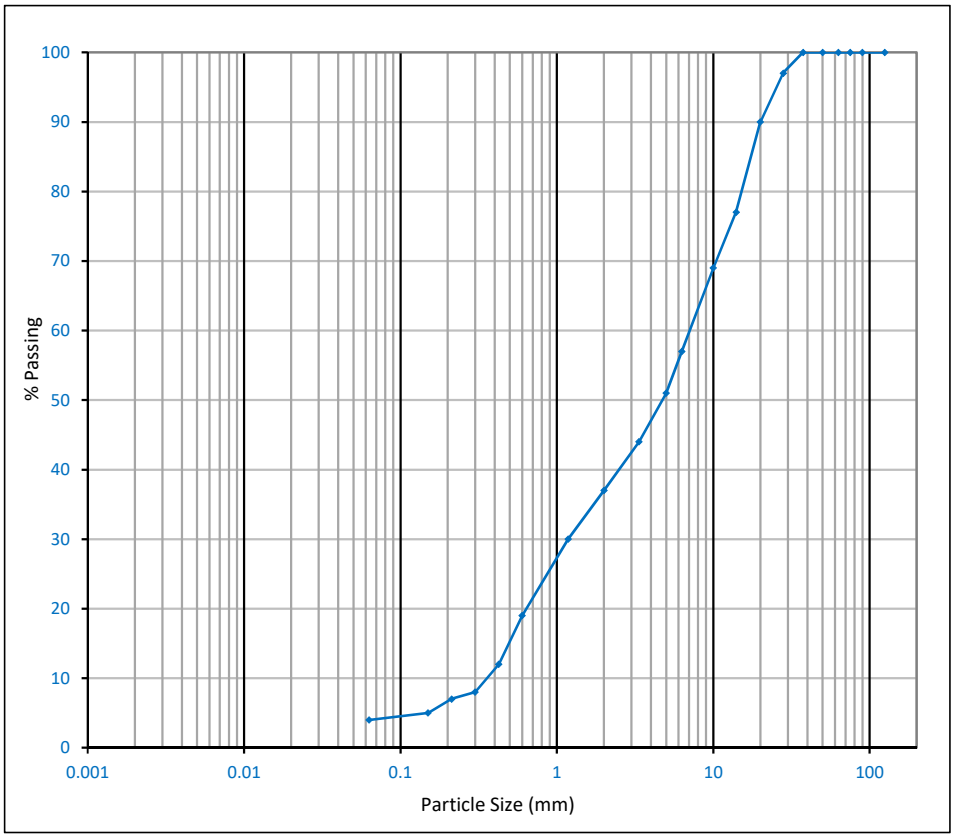
G19179-C/002 - Amendment A

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**78395**

Client Sample ID	-
Client Sample Location	WS13
Client Sample Type	B
Client Sample Number	7
Depth - Top (m)	3.00
Depth - Bottom (m)	3.70
Date of Sampling	02/11/20
Sample type	Disturbed
Sample Description	Brown silty, sandy gravel



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	97	
20	90	
14	77	
10	69	
6.3	57	
5	51	
3.35	44	56
2	37	Sand
1.18	30	
0.6	19	
0.425	12	
0.3	8	
0.212	7	
0.15	5	
0.063	4	40
		Fines 4

NOTES :

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

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

Analytical Test Report: G19179-D/002

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	15/04/2020
Your Order Number:	G19179-D	Testing Instruction Received:	15/04/2020
Report Issue Number:	1	Sample Tested:	15/04 to 04/05/2020
Samples Analysed:	5 soil samples	Report issued:	04/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-D\[G19179-D-002.XLSX]Cover Sheet

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

G19179-D/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			87033	87034	87035	87036	87037
Client Sample ID			-	-	-	-	-
Client Sample Location			BH1R	BH1R	BH1R	BH2R	BH2R
Client Sample Type			D	D	D	D	D
Client Sample Number			1	4	7	3	9
Depth - Top (m)			7.50	9.30	10.83	9.40	11.50
Depth - Bottom (m)			7.50	10.00	11.00	9.80	11.95
Date of Sampling			25/03/2020	25/03/2020	25/03/2020	25/03/2020	25/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown grey clayey silt	Brown grey clayey silt	Brown silty clay	Grey clayey silt	Brown silty clay
Determinant	**Specification**	**Units**					
Moisture Content		(%)	22	25	37	17	25
Moisture Content Prep		-	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)

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

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

Analytical Test Report: G19179-E/002

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-E	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	09/04 to 20/05/2020
Samples Analysed:	5 soil samples	Report issued:	21/05/2020

Signed

Lee Harbottle
GCM operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Particle Size Distribution Sedimentation

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.4 sedimentation by pipette method.

The samples were not treated in accordance with cl.9.4.6.1.

1377 Determination of Undrained Shear Strength in Triaxial Compression

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS 1377: Part 7: 1990 clause 9, multi stage loading & SHW Series 600 cl 633.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-E\[G19179-E-002.XLSX]Cover Sheet

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

G19179-E/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86792	86794	86795	86796
Client Sample ID			-	-	-	-
Client Sample Location			BH7R	BH7R	BH7R	BH7R
Client Sample Type			D	D	D	D
Client Sample Number			5	8	14	18
Depth - Top (m)			1.50	2.45	6.50	10.00
Depth - Bottom (m)			1.60	2.50	7.50	10.45
Date of Sampling			17/03/2020	17/03/2020	17/03/2020	17/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty sandy gravelly clay	Brown silty clay	Brown grey silty clay with siltstone	Brown slightly gravelly clayey silt
Determinant	**Specification**	**Units**				
Moisture Content		(%)	-	21	16	28
Moisture Content Prep		-	-	3.2.3.1 (fine)	3.2.3.3 (coarse)	3.2.3.3 (coarse)
BS Test Sieve (mm)						
125.0		(% Passing)	100	-	-	-
90.0		(% Passing)	100	-	-	-
75.0		(% Passing)	100	-	-	-
63.0		(% Passing)	100	-	-	-
50.0		(% Passing)	100	-	-	-
37.5		(% Passing)	100	-	-	-
28.0		(% Passing)	98	-	-	-
20.0		(% Passing)	91	-	-	-
14.0		(% Passing)	84	-	-	-
10.0		(% Passing)	80	-	-	-
6.3		(% Passing)	75	-	-	-
5.0		(% Passing)	70	-	-	-
3.35		(% Passing)	66	-	-	-
2.00		(% Passing)	60	-	-	-
1.18		(% Passing)	57	-	-	-
0.600		(% Passing)	51	-	-	-
0.425		(% Passing)	45	-	-	-
0.300		(% Passing)	40	-	-	-
0.212		(% Passing)	36	-	-	-
0.150		(% Passing)	33	-	-	-
0.063		(% Passing)	30	-	-	-
0.02		(% Passing)	20	-	-	-
0.006		(% Passing)	9	-	-	-
0.002		(% Passing)	5	-	-	-
PSD test Method		-	9.2 Wet Sieve	-	-	-
Sedimentation was pretreated		-	No	-	-	-

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

G19179-E/002

Project Reference - Boulton Moor Derby

Analytical Test Results -
Triaxial (Multi Stage)

NC Reference		**86793**
Client Sample ID		-
Client Sample Location		BH7R
Client Sample Type		UT
Client Sample Number		7
Depth - Top (m)		2.00
Depth - Bottom (m)		2.50
Date of Sampling		17/03/2020
Sample type		Undisturbed
Sample Description		Brown silty clay
Determinant	**Units**	
Preperation Method		Undisturbed
Orientation within original sample		Vertical
Depth within original sample	mm	10
Initial Properties		
Sample height	mm	208
Sample width	mm	103
Moisture content	%	21
Bulk density	Mg/m^3	2.03
Dry density	Mg/m^3	1.68
Rate of strain	%/min	0.43
Type of membrane	-	Latex
Membrane thickness	mm	0.34
Test Data		
Cell pressure	kPa	50
Maximum deviator stress	kPa	98.7
Membrane correction	kPa	0.9
Corrected maximum deviator stress	kPa	98
Cumulative strain at failure	%	7
Mode of failure	-	intermediate
Shear strength (c_u)	**kPa**	**49**
Cell pressure	kPa	100
Maximum deviator stress	kPa	142
Membrane correction	kPa	0.9
Corrected maximum deviator stress	kPa	141
Cumulative strain at failure	%	9
Mode of failure	-	intermediate
Shear strength (c_u)	**kPa**	**70**
Cell pressure	kPa	150
Maximum deviator stress	kPa	178
Membrane correction	kPa	0.9
Corrected maximum deviator stress	kPa	177
Cumulative strain at failure	%	11
Mode of failure	-	intermediate
Shear strength (c_u)	**kPa**	**89**

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

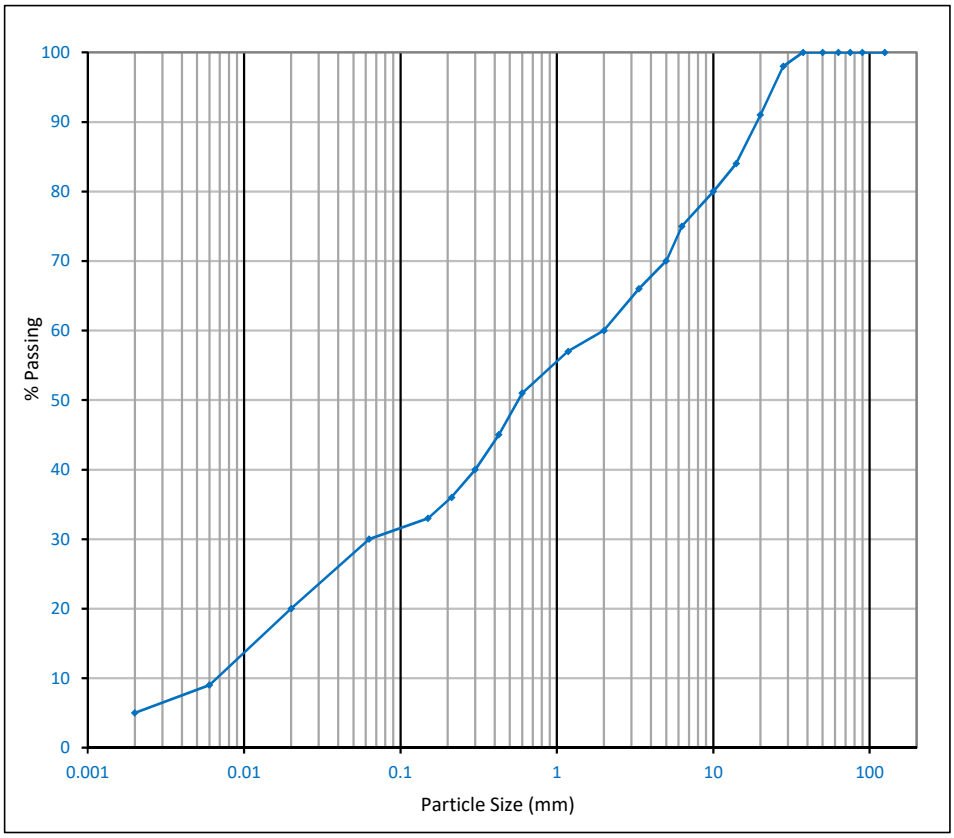
G19179-E/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86792**

Client Sample ID	-
Client Sample Location	BH7R
Client Sample Type	D
Client Sample Number	5
Depth - Top (m)	1.50
Depth - Bottom (m)	1.60
Date of Sampling	17/03/2020
Sample type	Disturbed
Sample Description	Brown silty sandy gravelly clay



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	98	
20	91	
14	84	
10	80	
6.3	75	
5	70	
3.35	66	34
2	60	Sand
1.18	57	
0.6	51	
0.425	45	
0.3	40	
0.212	36	
0.15	33	
0.063	30	36
0.02	20	Silt
0.006	9	
0.002	5	25
		Clay 5

NOTES :

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

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

Analytical Test Report: G19179-F/002-Interim

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-F	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	09/04 to 07/05/2020
Samples Analysed:	16 soil samples	Report issued:	13/05/2020

Signed

Lee Harbottle
GCM operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Determination of Undrained Shear Strength in Triaxial Compression

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS 1377: Part 7: 1990 clause 9, multi stage loading.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-F\[G19179-F-002.XLSX]Cover Sheet

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

G19179-F/002-Interim

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86807	86808	86810	86812	86813	86814
Client Sample ID			-	-	-	-	-	-
Client Sample Location			BH3	BH3	BH3	BH3	BH4	BH4
Client Sample Type			B	B	D	B	B	B
Client Sample Number			4	5	10	14	7	10
Depth - Top (m)			0.80	1.20	3.50	5.50	1.20	2.30
Depth - Bottom (m)			1.00	1.50	4.00	6.00	2.00	2.70
Date of Sampling			23/02/2020	23/02/2020	23/02/2020	23/02/2020	23/02/2020	23/02/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown gravelly silty clay	Brown slightly gravelly silty clay	Brown slightly sandy silt	Brown silty clay	Brown slightly silty clay	Brown silty slightly clayey gravelly sand
Determinant	**Specification**	**Units**						
Moisture Content		(%)	12	22	24	31	16	-
Moisture Content Prep		-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)	-
Fines passing 425µm test sieve		(%)	-	91	100	-	82	-
Liquid Limit		(%)	-	47	27	-	39	-
Plastic Limit		(%)	-	27	Non Plastic	-	16	-
Plasticity Index		(%)	-	20	Non Plastic	-	23	-
PI preparation		-	-	from its natural state	from its natural state	-	from its natural state	-
PI Test Method			-	clause 4.4 (one point)	clause 4.4 (one point)	-	clause 4.4 (one point)	-
Linear Shrinkage		(%)	-	-	2.6	-	-	-
BS Test Sieve (mm)								
125.0		(% Passing)	-	-	-	-	-	100
90.0		(% Passing)	-	-	-	-	-	100
75.0		(% Passing)	-	-	-	-	-	100
63.0		(% Passing)	-	-	-	-	-	100
50.0		(% Passing)	-	-	-	-	-	100
37.5		(% Passing)	-	-	-	-	-	98
28.0		(% Passing)	-	-	-	-	-	97
20.0		(% Passing)	-	-	-	-	-	86
14.0		(% Passing)	-	-	-	-	-	73
10.0		(% Passing)	-	-	-	-	-	64
6.3		(% Passing)	-	-	-	-	-	54
5.0		(% Passing)	-	-	-	-	-	49
3.35		(% Passing)	-	-	-	-	-	44
2.00		(% Passing)	-	-	-	-	-	38
1.18		(% Passing)	-	-	-	-	-	34
0.600		(% Passing)	-	-	-	-	-	25
0.425		(% Passing)	-	-	-	-	-	19
0.300		(% Passing)	-	-	-	-	-	16
0.212		(% Passing)	-	-	-	-	-	14
0.150		(% Passing)	-	-	-	-	-	13
0.063		(% Passing)	-	-	-	-	-	12
PSD test Method		-	-	-	-	-	-	9.2 Wet Sieve

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

G19179-F/002-Interim

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86815	86816	86817	86820	86821
Client Sample ID			-	-	-	-	-
Client Sample Location			BH4	BH8	BH8	BH8	BH8
Client Sample Type			D	D	B	D	B
Client Sample Number			14	6	8	17	21
Depth - Top (m)			3.70	1.60	3.20	7.00	9.00
Depth - Bottom (m)			4.00	2.00	4.00	7.50	9.50
Date of Sampling			23/02/2020	23/02/2020	23/02/2020	23/02/2020	23/02/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty clay	Brown silty gravelly clayey sand	Brown slightly gravelly slightly silty clay with occasional chalk	Brown slightly gravelly slightly sandy silt	Brown slightly silty clay
Determinant	**Specification**	**Units**					
Moisture Content		(%)	21	-	14	13	29
Moisture Content Prep		-	3.2.3.1 (fine)	-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.1 (fine)
Fines passing 425µm test sieve		(%)	-	-	97	94	-
Liquid Limit		(%)	-	-	32	24	-
Plastic Limit		(%)	-	-	14	Non Plastic	-
Plasticity Index		(%)	-	-	18	Non Plastic	-
PI preparation		-	-	-	from its natural state	from its natural state	-
PI Test Method			-	-	clause 4.4 (one point)	clause 4.4 (one point)	-
Linear Shrinkage		(%)	-	-	-	6.9	-
BS Test Sieve (mm)							
125.0		(% Passing)	-	100	-	-	-
90.0		(% Passing)	-	100	-	-	-
75.0		(% Passing)	-	100	-	-	-
63.0		(% Passing)	-	100	-	-	-
50.0		(% Passing)	-	100	-	-	-
37.5		(% Passing)	-	100	-	-	-
28.0		(% Passing)	-	100	-	-	-
20.0		(% Passing)	-	100	-	-	-
14.0		(% Passing)	-	95	-	-	-
10.0		(% Passing)	-	89	-	-	-
6.3		(% Passing)	-	80	-	-	-
5.0		(% Passing)	-	74	-	-	-
3.35		(% Passing)	-	64	-	-	-
2.00		(% Passing)	-	57	-	-	-
1.18		(% Passing)	-	51	-	-	-
0.600		(% Passing)	-	44	-	-	-
0.425		(% Passing)	-	38	-	-	-
0.300		(% Passing)	-	31	-	-	-
0.212		(% Passing)	-	25	-	-	-
0.150		(% Passing)	-	21	-	-	-
0.063		(% Passing)	-	17	-	-	-
PSD test Method		-	-	9.2 Wet Sieve	-	-	-

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

G19179-F/002-Interim

Project Reference - Boulton Moor Derby

Analytical Test Results -
Triaxial (Multi Stage)

NC Reference		86809	86811	86818	86819	86822
Client Sample ID		-	-	-	-	-
Client Sample Location		BH3	BH3	BH8	BH8	BH8
Client Sample Type		UT	UT	UT	UT	UT
Client Sample Number		8	12	9	15	22
Depth - Top (m)		3.00	5.00	4.00	6.50	9.50
Depth - Bottom (m)		3.45	5.45	4.45	6.95	10.00
Date of Sampling		23/02/2020	23/02/2020	23/02/2020	23/02/2020	23/02/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silt	Brown slightly sandy silt	Brown silty clay	Brown silty clay	Brown silty clay
Determinant	**Units**					
Preperation Method		Undisturbed	Undisturbed	Undisturbed	Undisturbed	Undisturbed
Orientation within original sample		Vertical	Vertical	Vertical	Vertical	Vertical
Depth within original sample	mm	200	100	100	100	100
Initial Properties						
Sample height	mm	208	193	208	208	208
Sample width	mm	103	103	103	103	103
Moisture content	%	19	26	16	14	14
Bulk density	Mg/m^3	2.09	2.03	2.21	2.26	2.22
Dry density	Mg/m^3	1.76	1.61	1.91	1.98	1.95
Rate of strain	%/min	0.74	0.90	0.71	0.69	0.69
Type of membrane	-	Latex	Latex	Latex	Latex	Latex
Membrane thickness	mm	0.34	0.34	0.34	0.34	0.34
Test Data						
Cell pressure	kPa	60	100	75	100	150
Maximum deviator stress	kPa	314	69.1	325	395	430
Membrane correction	kPa	0.6	0.9	0.9	0.3	0.6
Corrected maximum deviator stress	kPa	313	68	324	394	429
Cumulative strain at failure	%	9	10	14	6	7
Mode of failure	-	intermediate	plastic	plastic	plastic	brittle
Shear strength (c_u)	**kPa**	**157**	**34**	**162**	**197**	**215**
Cell pressure	kPa	120	150	150	160	200
Maximum deviator stress	kPa	373	75.0	359	499	434
Membrane correction	kPa	0.6	0.9	0.9	0.3	0.6
Corrected maximum deviator stress	kPa	373	74	358	499	433
Cumulative strain at failure	%	11	14	16	8	7
Mode of failure	-	intermediate	plastic	plastic	plastic	brittle
Shear strength (c_u)	**kPa**	**186**	**37**	**179**	**250**	**217**
Cell pressure	kPa	180	200	225		250
Maximum deviator stress	kPa	470	82.3	379		445
Membrane correction	kPa	0.6	0.9	0.9		0.6
Corrected maximum deviator stress	kPa	469	81	378	Failed at second pressure	445
Cumulative strain at failure	%	13	22	18		10
Mode of failure	-	intermediate	plastic	plastic		brittle
Shear strength (c_u)	**kPa**	**235**	**41**	**189**		**222**

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

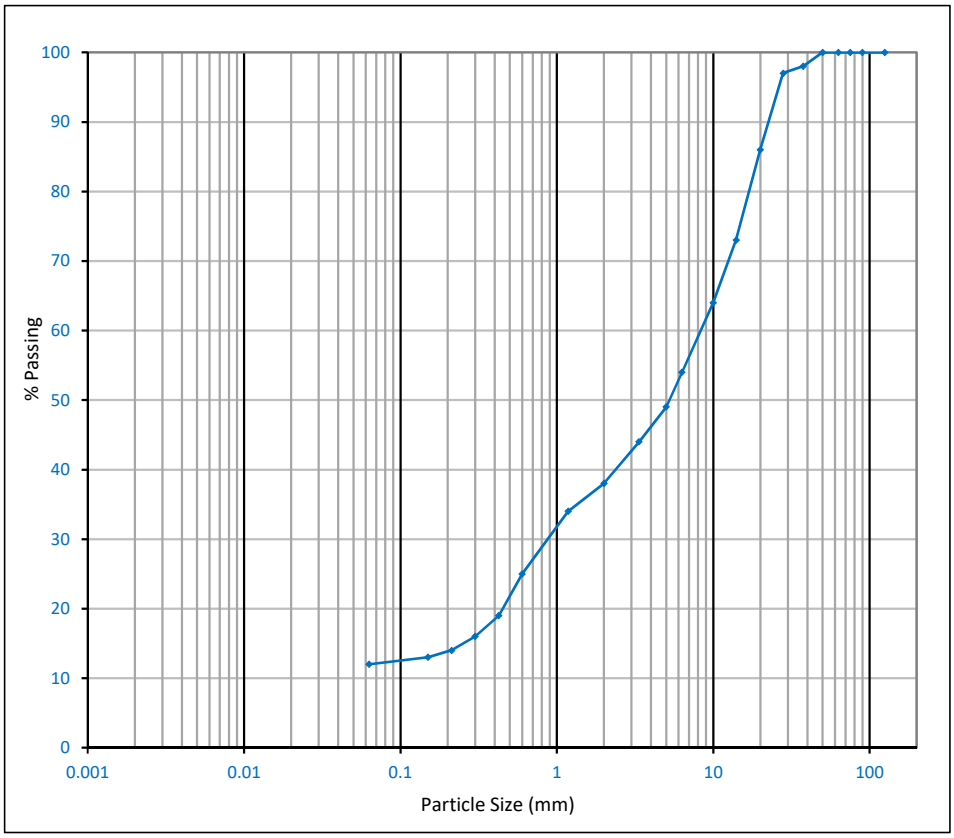
G19179-F/002-Interim

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86814**

Client Sample ID	-
Client Sample Location	BH4
Client Sample Type	B
Client Sample Number	10
Depth - Top (m)	2.30
Depth - Bottom (m)	2.70
Date of Sampling	23/02/2020
Sample type	Disturbed
Sample Description	Brown silty slightly clayey gravelly sand



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	98	
28	97	
20	86	
14	73	
10	64	
6.3	54	
5	49	
3.35	44	56
2	38	Sand
1.18	34	
0.6	25	
0.425	19	
0.3	16	
0.212	14	
0.15	13	
0.063	12	32
		Fines 12

NOTES :

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

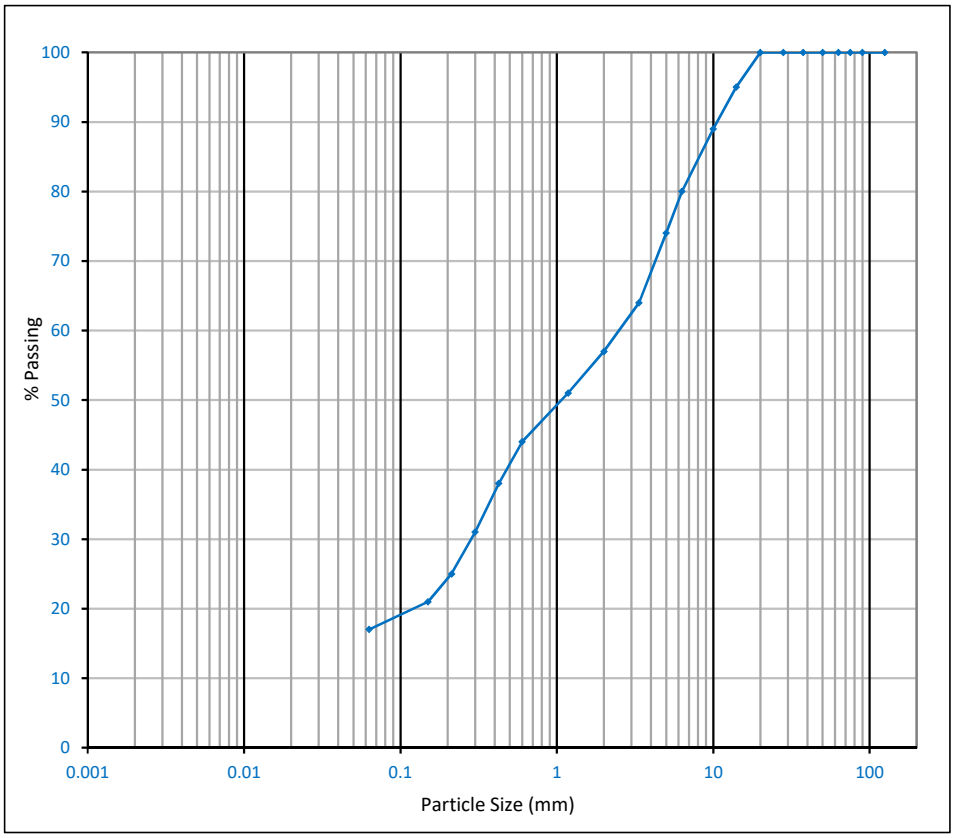
G19179-F/002-Interim

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86816**

Client Sample ID	-
Client Sample Location	BH8
Client Sample Type	D
Client Sample Number	6
Depth - Top (m)	1.60
Depth - Bottom (m)	2.00
Date of Sampling	23/02/2020
Sample type	Disturbed
Sample Description	Brown silty gravelly clayey sand



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	95	
10	89	
6.3	80	
5	74	
3.35	64	36
2	57	Sand
1.18	51	
0.6	44	
0.425	38	
0.3	31	
0.212	25	
0.15	21	
0.063	17	47
		Fines 17

NOTES :

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

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

Analytical Test Report: G19179-G/002

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-G	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	09/04 to 20/05/2020
Samples Analysed:	16 soil samples	Report issued:	21/05/2020

Signed

Lee Harbottle
GCM operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Particle Size Distribution Sedimentation

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.4 sedimentation by pipette method.

The samples were/were not treated in accordance with cl.9.4.6.1.

1377 Determination of Undrained Shear Strength in Triaxial Compression

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS 1377: Part 7: 1990 clause 8, single stage loading.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-G\[G19179-G-002.XLSX]Cover Sheet

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

G19179-G/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86827	86828	86829	86832	86833	86835
Client Sample ID			-	-	-	-	-	-
Client Sample Location			BH9	BH9	BH9	BH9	BH9	BH10
Client Sample Type			B	B	B	D	D	B
Client Sample Number			2	3	10	17	20	2
Depth - Top (m)			0.30	0.90	3.60	6.95	9.00	0.30
Depth - Bottom (m)			0.50	1.10	4.00	7.00	9.10	0.50
Date of Sampling			19/03/2020	19/03/2020	19/03/2020	19/03/2020	19/03/2020	19/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty gravelly sand	Brown silty clayey gravelly sand	Brown silty clay with occasional chalk	Brown slightly gravelly slightly silty clay with occasional chalk	Brown slightly gravelly slightly silty clay with chalk	Brown slightly silty sand with occasional organic matter
Determinant	**Specification**	**Units**						
Moisture Content		(%)	-	11	16	16	12	9.9
Moisture Content Prep		-	-	3.2.3.3 (coarse)	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.3 (coarse)
Fines passing 425µm test sieve		(%)	-	-	85	-	90	-
Liquid Limit		(%)	-	-	28	-	29	-
Plastic Limit		(%)	-	-	13	-	13	-
Plasticity Index		(%)	-	-	15	-	16	-
PI preparation		-	-	-	from its natural state	-	from its natural state	-
PI Test Method			-	-	clause 4.4 (one point)	-	clause 4.4 (one point)	-
BS Test Sieve (mm)								
125.0		(% Passing)	100	100	100	-	-	100
90.0		(% Passing)	100	100	100	-	-	100
75.0		(% Passing)	100	100	100	-	-	100
63.0		(% Passing)	100	100	100	-	-	100
50.0		(% Passing)	100	100	100	-	-	100
37.5		(% Passing)	97	96	100	-	-	92
28.0		(% Passing)	87	91	100	-	-	87
20.0		(% Passing)	79	82	100	-	-	79
14.0		(% Passing)	73	75	100	-	-	74
10.0		(% Passing)	67	68	97	-	-	69
6.3		(% Passing)	59	62	96	-	-	64
5.0		(% Passing)	58	60	96	-	-	61
3.35		(% Passing)	57	57	94	-	-	57
2.00		(% Passing)	55	53	92	-	-	54
1.18		(% Passing)	52	50	90	-	-	49
0.600		(% Passing)	44	41	87	-	-	39
0.425		(% Passing)	34	33	85	-	-	31
0.300		(% Passing)	26	26	80	-	-	23
0.212		(% Passing)	21	22	72	-	-	18
0.150		(% Passing)	17	18	65	-	-	13
0.063		(% Passing)	10	12	55	-	-	6
0.02		(% Passing)	-	-	42	-	-	-
0.006		(% Passing)	-	-	33	-	-	-
0.002		(% Passing)	-	-	26	-	-	-
PSD test Method		-	9.2 Wet Sieve	9.2 Wet Sieve	9.2 Wet Sieve	-	-	9.2 Wet Sieve
Sedimentation was pretreated		-	-	-	No	-	-	-

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

G19179-G/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86836	86838	86840	86841	86842
Client Sample ID			-	-	-	-	-
Client Sample Location			BH10	BH10	BH10	BH10	BH10
Client Sample Type			B	D	UT	B	B
Client Sample Number			11	16	21	25	30
Depth - Top (m)			3.50	6.00	9.50	11.10	14.00
Depth - Bottom (m)			4.00	6.10	9.95	11.50	14.50
Date of Sampling			19/03/2020	19/03/2020	19/03/2020	19/03/2020	19/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown slightly gravelly slightly silty clay with occasional chalk	Brown slightly gravelly slightly silty clay with occasional chalk	Brown silty clay	Brown slightly gravelly slightly silty clay	Brown slightly gravelly slightly silty clay
Determinant	**Specification**	**Units**					
Moisture Content		(%)	17	12	13	15	12
Moisture Content Prep		-	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.2 (medium)
Fines passing 425µm test sieve		(%)	21	-	100	-	-
Liquid Limit		(%)	29	-	31	-	-
Plastic Limit		(%)	13	-	18	-	-
Plasticity Index		(%)	16	-	13	-	-
PI preparation		-	from its natural state	-	from its natural state	-	-
PI Test Method			clause 4.4 (one point)	-	clause 4.4 (one point)	-	-
BS Test Sieve (mm)							
125.0		(% Passing)	-	-	-	-	-
90.0		(% Passing)	-	-	-	-	-
75.0		(% Passing)	-	-	-	-	-
63.0		(% Passing)	-	-	-	-	-
50.0		(% Passing)	-	-	-	-	-
37.5		(% Passing)	-	-	-	-	-
28.0		(% Passing)	-	-	-	-	-
20.0		(% Passing)	-	-	-	-	-
14.0		(% Passing)	-	-	-	-	-
10.0		(% Passing)	-	-	-	-	-
6.3		(% Passing)	-	-	-	-	-
5.0		(% Passing)	-	-	-	-	-
3.35		(% Passing)	-	-	-	-	-
2.00		(% Passing)	-	-	-	-	-
1.18		(% Passing)	-	-	-	-	-
0.600		(% Passing)	-	-	-	-	-
0.425		(% Passing)	-	-	-	-	-
0.300		(% Passing)	-	-	-	-	-
0.212		(% Passing)	-	-	-	-	-
0.150		(% Passing)	-	-	-	-	-
0.063		(% Passing)	-	-	-	-	-
0.02		(% Passing)	-	-	-	-	-
0.006		(% Passing)	-	-	-	-	-
0.002		(% Passing)	-	-	-	-	-
PSD test Method		-	-	-	-	-	-
Sedimentation was pretreated		-	-	-	-	-	-

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

G19179-G/002

Project Reference - Boulton Moor Derby

Analytical Test Results -
Triaxial (Multi Stage)

NC Reference		86830	86831	86834	86837	86839	86840
Client Sample ID		-	-	-	-	-	-
Client Sample Location		BH9	BH9	BH9	BH10	BH10	BH10
Client Sample Type		UT	UT	UT	UT	UT	UT
Client Sample Number		11	16	21	12	17	21
Depth - Top (m)		4.00	6.50	9.50	4.00	6.50	9.50
Depth - Bottom (m)		4.45	6.95	9.95	4.45	6.95	9.95
Date of Sampling		19/03/2020	19/03/2020	19/03/2020	19/03/2020	19/03/2020	19/03/2020
Sample type		Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description		Brown silty clay with occasional siltstone	Brown silty clay with occasional chalk	Brown silty clay	Brown silty clay with occasional chalk	Brown silty clay with occasional chalk	Brown silty clay
Determinant	**Units**						
Preperation Method		Undisturbed	Undisturbed	Undisturbed	Undisturbed	Undisturbed	Undisturbed
Orientation within original sample		Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
Depth within original sample	mm	30	30	30	30	120	200
Initial Properties							
Sample height	mm	208	208	208	208	208	208
Sample width	mm	103	103	103	103	103	103
Moisture content	%	11	13	16	12	17	13
Bulk density	Mg/m^3	2.32	2.31	2.26	2.33	2.32	2.28
Dry density	Mg/m^3	2.09	2.04	1.95	2.08	1.99	2.01
Rate of strain	%/min	0.66	0.64	0.59	0.70	0.72	0.70
Type of membrane	-	Latex	Latex	Latex	Latex	Latex	Latex
Membrane thickness	mm	0.34	0.34	0.34	0.34	0.34	0.34
Test Data							
Cell pressure	kPa	75	100	150	75	100	150
Maximum deviator stress	kPa	515	515	519	441	489	506
Membrane correction	kPa	0.3	0.9	0.3	0.6	0.6	0.3
Corrected maximum deviator stress	kPa	515	514	519	441	489	506
Cumulative strain at failure	%	5	5	4	9.6	10	7
Mode of failure	-	plastic	plastic	plastic	plastic	plastic	plastic
Shear strength (c_u)	**kPa**	**257**	**257**	**259**	**220**	**244**	**253**
Cell pressure	kPa				150		
Maximum deviator stress	kPa				451		
Membrane correction	kPa				0.6		
Corrected maximum deviator stress	kPa				451		
Cumulative strain at failure	%				10.6		
Mode of failure	-				plastic		
Shear strength (c_u)	**kPa**	Failed at first pressure	Failed at first pressure	Failed at first pressure	**225**	Failed at first pressure	Failed at first pressure
Cell pressure	kPa				225		
Maximum deviator stress	kPa				464		
Membrane correction	kPa				0.6		
Corrected maximum deviator stress	kPa				463		
Cumulative strain at failure	%				12.5		
Mode of failure	-				plastic		
Shear strength (c_u)	**kPa**				**232**		

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

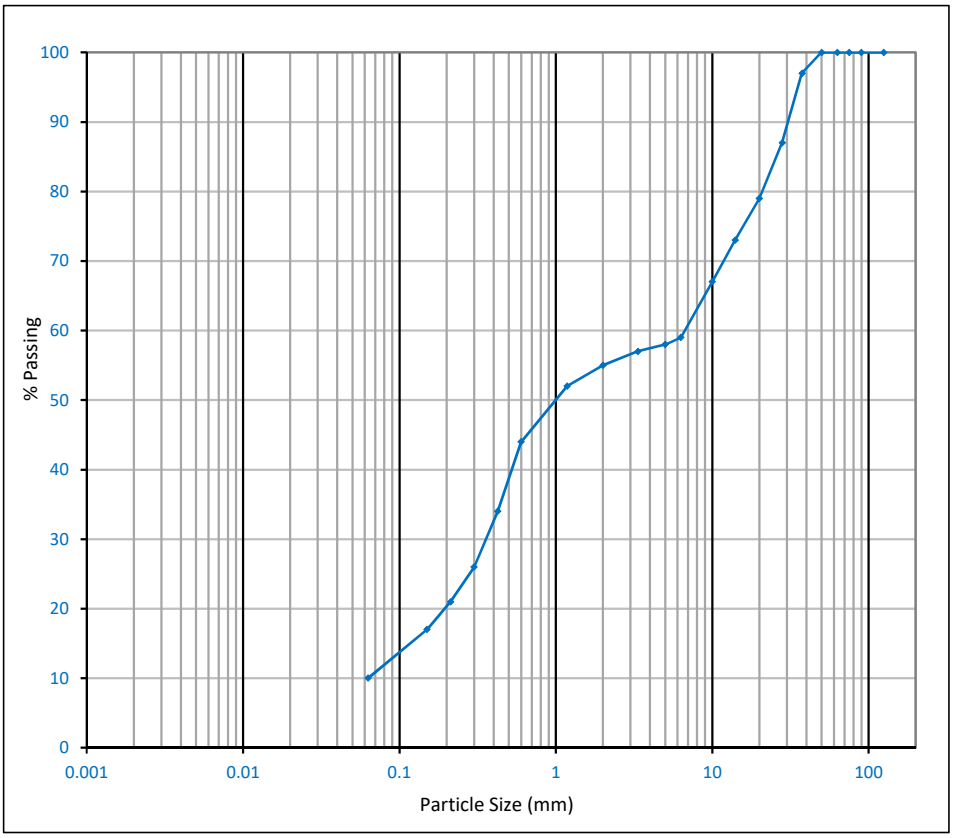
G19179-G/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86827**

Client Sample ID	-
Client Sample Location	BH9
Client Sample Type	B
Client Sample Number	2
Depth - Top (m)	0.30
Depth - Bottom (m)	0.50
Date of Sampling	19/03/2020
Sample type	Disturbed
Sample Description	Brown silty gravelly sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	97	
28	87	
20	79	
14	73	
10	67	
6.3	59	
5	58	
3.35	57	43
2	55	Sand
1.18	52	
0.6	44	
0.425	34	
0.3	26	
0.212	21	
0.15	17	
0.063	10	47
		Fines 10

NOTES :

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

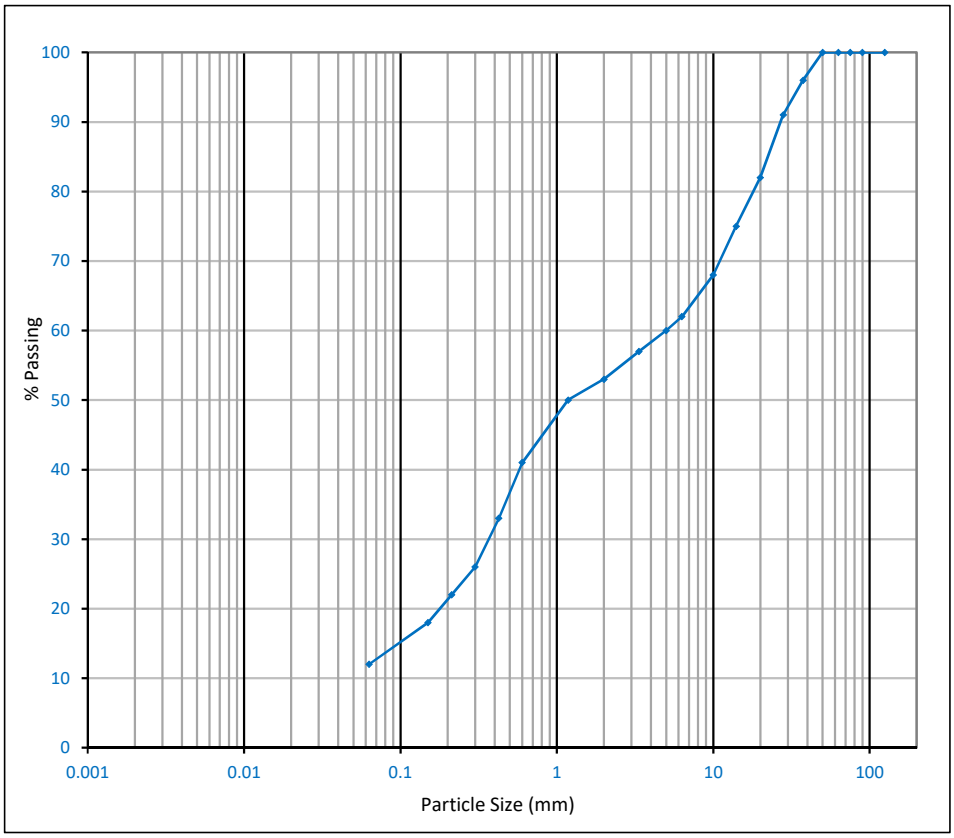
G19179-G/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86828**

Client Sample ID	-
Client Sample Location	BH9
Client Sample Type	B
Client Sample Number	3
Depth - Top (m)	0.90
Depth - Bottom (m)	1.10
Date of Sampling	19/03/2020
Sample type	Disturbed
Sample Description	Brown silty clayey gravelly sand



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	96	
28	91	
20	82	
14	75	
10	68	
6.3	62	
5	60	
3.35	57	43
2	53	Sand
1.18	50	
0.6	41	
0.425	33	
0.3	26	
0.212	22	
0.15	18	
0.063	12	45
		Fines 12

NOTES :

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

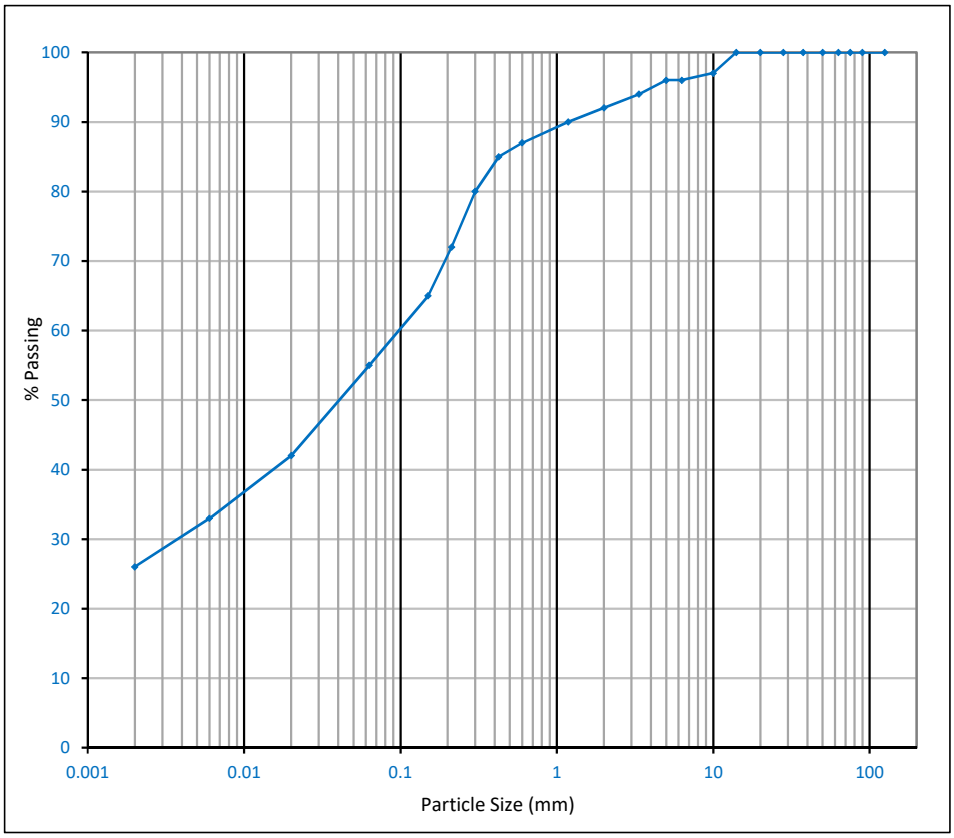
G19179-G/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86829**

Client Sample ID	-
Client Sample Location	BH9
Client Sample Type	B
Client Sample Number	10
Depth - Top (m)	3.60
Depth - Bottom (m)	4.00
Date of Sampling	19/03/2020
Sample type	Disturbed
Sample Description	Brown silty clay with occasional chalk



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	100	
20	100	
14	100	
10	97	
6.3	96	
5	96	
3.35	94	6
2	92	Sand
1.18	90	
0.6	87	
0.425	85	
0.3	80	
0.212	72	
0.15	65	
0.063	55	39
0.02	42	Silt
0.006	33	
0.002	26	29
		Clay 26

NOTES :

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

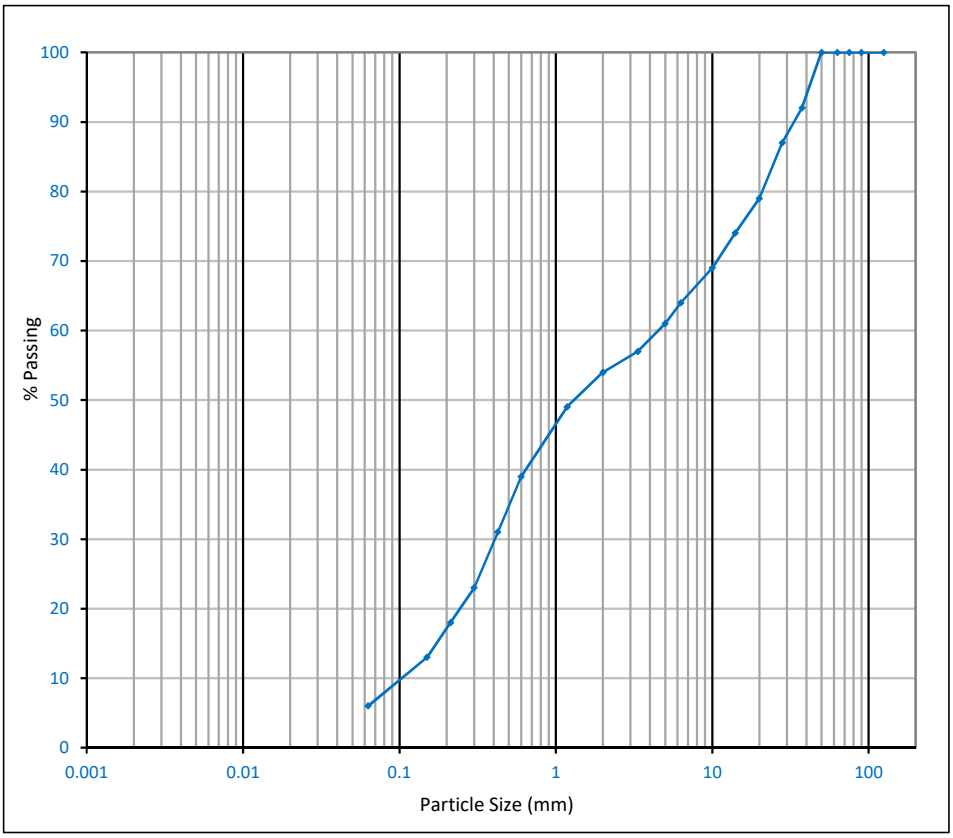
G19179-G/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86835**

Client Sample ID	-
Client Sample Location	BH10
Client Sample Type	B
Client Sample Number	2
Depth - Top (m)	0.30
Depth - Bottom (m)	0.50
Date of Sampling	19/03/2020
Sample type	Disturbed
Sample Description	Brown slightly silty sand with occasional organic matter



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	92	
28	87	
20	79	
14	74	
10	69	
6.3	64	
5	61	
3.35	57	43
2	54	Sand
1.18	49	
0.6	39	
0.425	31	
0.3	23	
0.212	18	
0.15	13	
0.063	6	51
		Fines 6

NOTES :

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

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

Analytical Test Report: G19179-H/002

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	15/04/2020
Your Order Number:	G19179-H	Testing Instruction Received:	15/04/2020
Report Issue Number:	1	Sample Tested:	15/04 to 19/05/2020
Samples Analysed:	10 soil samples	Report issued:	21/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

1377 Particle Size Distribution Sedimentation

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.4 sedimentation by pipette method.

The samples were not treated in accordance with cl.9.4.6.1.

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-H\[G19179-H-002.XLSX]Cover Sheet

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

G19179-H/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			87023	87024	87025	87026	87027	87028
Client Sample ID			-	-	-	-	-	-
Client Sample Location			WS1	WS1	WS1	WS1	WS2	WS2
Client Sample Type			B	D	D	D	D	D
Client Sample Number			4	6	12	17	6	11
Depth - Top (m)			0.80	1.10	2.50	4.00	1.20	3.30
Depth - Bottom (m)			1.00	1.20	3.00	5.00	1.50	3.70
Date of Sampling			23/03/2020	23/03/2020	23/03/2020	23/03/2020	23/03/2020	23/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty sandy gravelly clay	Brown gravelly silty clay	Brown sandy silt	Brown silty clay	Grey brown silty clay	Brown slightly gravelly sandy silt
Determinant	**Specification**	**Units**						
Moisture Content		(%)	-	15	21	17	25	23
Moisture Content Prep		-	-	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)
Fines passing 425µm test sieve		(%)	-	-	100	-	100	89
Liquid Limit		(%)	-	-	29	-	36	28
Plastic Limit		(%)	-	-	Non Plastic	-	23	Non Plastic
Plasticity Index		(%)	-	-	Non Plastic	-	13	Non Plastic
PI preparation		-	-	-	from its natural state	-	from its natural state	from its natural state
PI Test Method			-	-	clause 4.4 (one point)	-	clause 4.4 (one point)	clause 4.4 (one point)
Linear Shrinkage		(%)	-	-	2.9	-	-	2.5
BS Test Sieve (mm)								
125.0		(% Passing)	100	-	-	-	-	-
90.0		(% Passing)	100	-	-	-	-	-
75.0		(% Passing)	100	-	-	-	-	-
63.0		(% Passing)	100	-	-	-	-	-
50.0		(% Passing)	100	-	-	-	-	-
37.5		(% Passing)	100	-	-	-	-	-
28.0		(% Passing)	90	-	-	-	-	-
20.0		(% Passing)	77	-	-	-	-	-
14.0		(% Passing)	73	-	-	-	-	-
10.0		(% Passing)	68	-	-	-	-	-
6.3		(% Passing)	62	-	-	-	-	-
5.0		(% Passing)	60	-	-	-	-	-
3.35		(% Passing)	57	-	-	-	-	-
2.00		(% Passing)	54	-	-	-	-	-
1.18		(% Passing)	51	-	-	-	-	-
0.600		(% Passing)	47	-	-	-	-	-
0.425		(% Passing)	43	-	-	-	-	-
0.300		(% Passing)	38	-	-	-	-	-
0.212		(% Passing)	32	-	-	-	-	-
0.150		(% Passing)	27	-	-	-	-	-
0.063		(% Passing)	19	-	-	-	-	-
0.02		(% Passing)	-	-	-	-	-	-
0.006		(% Passing)	-	-	-	-	-	-
0.002		(% Passing)	-	-	-	-	-	-
PSD test Method		-	9.2 Wet Sieve	-	-	-	-	-
Sedimentation was pretreated		-	-	-	-	-	-	-

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

G19179-H/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			87029	87030	87031	87032
Client Sample ID			-	-	-	-
Client Sample Location			WS2	WS3	WS3	WS3
Client Sample Type			D	B	D	D
Client Sample Number			14	6	12	14
Depth - Top (m)			4.00	1.20	3.40	4.00
Depth - Bottom (m)			5.00	1.80	3.65	4.45
Date of Sampling			23/03/2020	23/03/2020	23/03/2020	23/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty clay	Brown silty slightly sandy gravelly clay	Brown slightly gravelly silty clay	Brown slightly silty clay
Determinant	**Specification**	**Units**				
Moisture Content		(%)	30	12	17	18
Moisture Content Prep		-	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.2 (medium)	3.2.3.1 (fine)
Fines passing 425µm test sieve		(%)	-	-	85	-
Liquid Limit		(%)	-	-	29	-
Plastic Limit		(%)	-	-	18	-
Plasticity Index		(%)	-	-	11	-
PI preparation		-	-	-	from its natural state	-
PI Test Method			-	-	clause 4.4 (one point)	-
Linear Shrinkage		(%)	-	-	-	-
BS Test Sieve (mm)						
125.0		(% Passing)	-	100		
90.0		(% Passing)	-	100		
75.0		(% Passing)	-	100		
63.0		(% Passing)	-	100		
50.0		(% Passing)	-	100		
37.5		(% Passing)	-	100		
28.0		(% Passing)	-	98		
20.0		(% Passing)	-	91		
14.0		(% Passing)	-	85		
10.0		(% Passing)	-	80		
6.3		(% Passing)	-	74		
5.0		(% Passing)	-	71		
3.35		(% Passing)	-	67		
2.00		(% Passing)	-	61		
1.18		(% Passing)	-	57		
0.600		(% Passing)	-	50		
0.425		(% Passing)	-	45		
0.300		(% Passing)	-	40		
0.212		(% Passing)	-	36		
0.150		(% Passing)	-	33		
0.063		(% Passing)	-	30		
0.02		(% Passing)	-	23		
0.006		(% Passing)	-	19		
0.002		(% Passing)	-	14		
PSD test Method		-	-	9.2 Wet Sieve		
Sedimentation was pretreated		-	-	No		

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

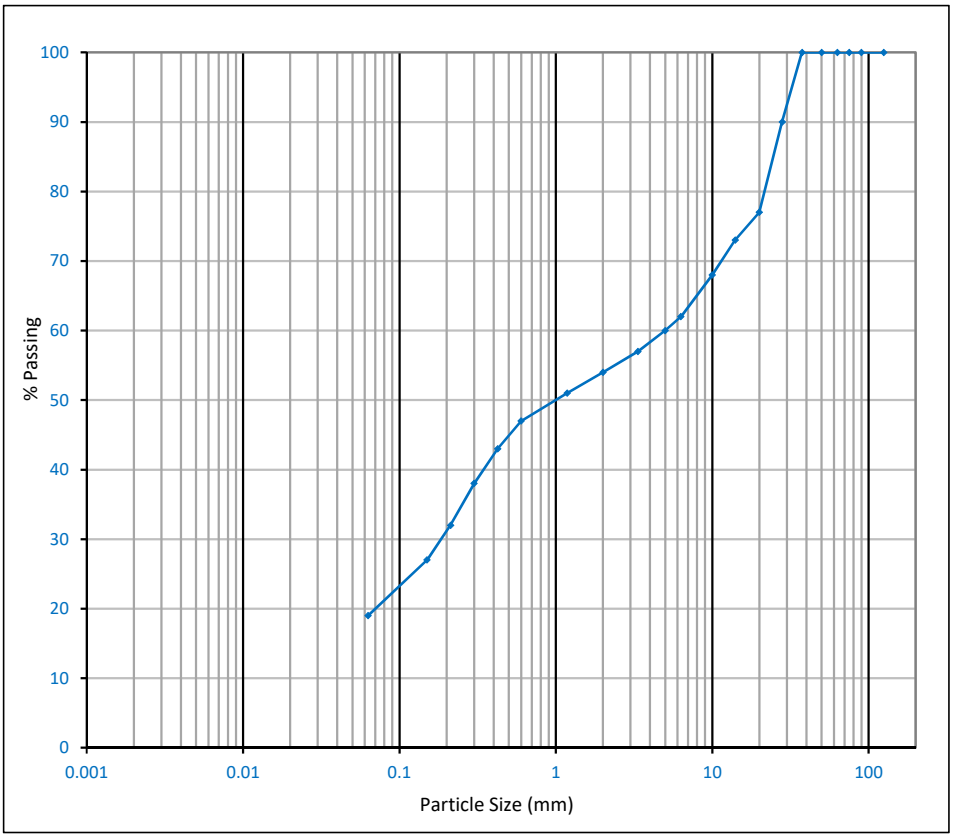
G19179-H/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**87023**

Client Sample ID	-
Client Sample Location	WS1
Client Sample Type	B
Client Sample Number	4
Depth - Top (m)	0.80
Depth - Bottom (m)	1.00
Date of Sampling	23/03/2020
Sample type	Disturbed
Sample Description	Brown silty sandy gravelly clay



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	90	
20	77	
14	73	
10	68	
6.3	62	
5	60	
3.35	57	43
2	54	Sand
1.18	51	
0.6	47	
0.425	43	
0.3	38	
0.212	32	
0.15	27	
0.063	19	38
		Fines 19

NOTES :

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

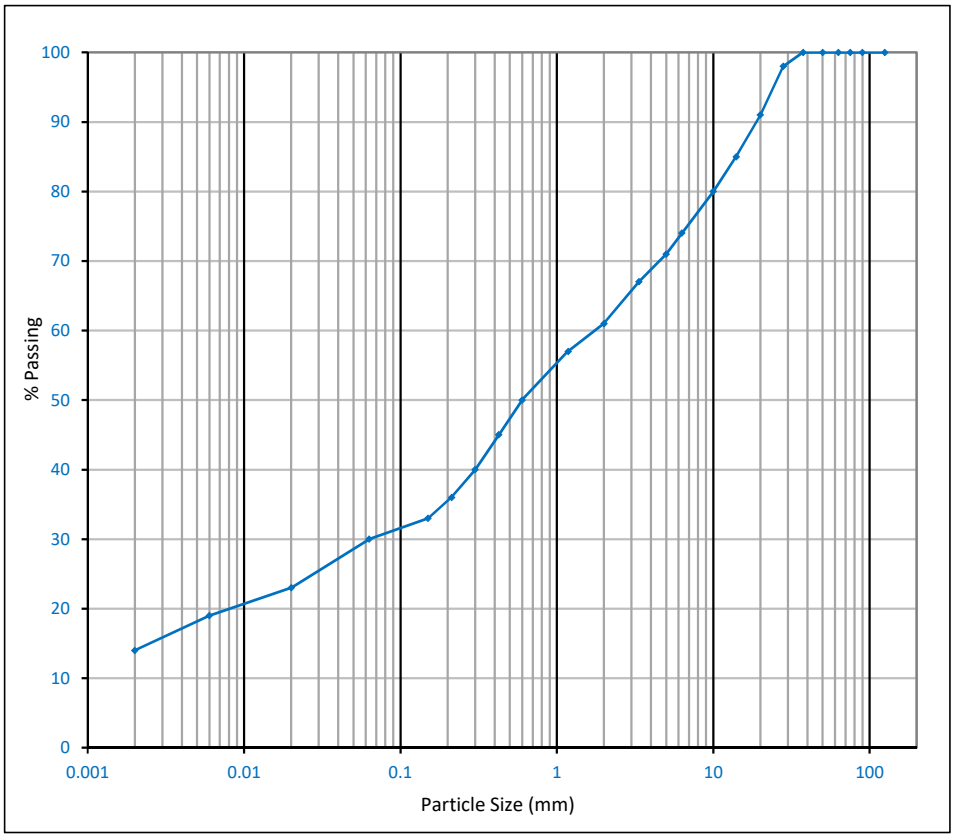
G19179-H/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**87030**

Client Sample ID	-
Client Sample Location	WS3
Client Sample Type	B
Client Sample Number	6
Depth - Top (m)	1.20
Depth - Bottom (m)	1.80
Date of Sampling	23/03/2020
Sample type	Disturbed
Sample Description	Brown silty slightly sandy gravelly clay



Specification:

Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	98	
20	91	
14	85	
10	80	
6.3	74	
5	71	
3.35	67	33
2	61	Sand
1.18	57	
0.6	50	
0.425	45	
0.3	40	
0.212	36	
0.15	33	
0.063	30	37
0.02	23	Silt
0.006	19	
0.002	14	16
		Clay 14

NOTES :

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

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

Analytical Test Report: G19179-I/002

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-I	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	09/04 to 07/05/2020
Samples Analysed:	7 soil samples	Report issued:	13/05/2020

Signed

Lee Harbottle
GCM Operations Manager
Nicholls Colton Group

Notes:

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied.

Samples were supplied by customer, results apply to the samples as received.

1377 Plasticity Index

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990

1377 Moisture Content

Sample preparation was in accordance with BS1377:Part 1:2016.

Moisture content testing was in accordance with BS1377 : Part 2 :1990

1377 Particle Size Distribution

Sample preparation was in accordance with BS1377:Part 1:2016.

Testing was in accordance with BS1377:Part 2:1990 clause 9.2 wet sieving method

Accreditation Key

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 27/11/2019

Owned by Emily Blissett - Commercial Reporting Supervisor
Authorised by Lee Harbottle - GCM Operations Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-I\[G19179-I-002.XLSX]Soil

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

G19179-I/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			86848	86849	86850	86851	86852	86853
Client Sample ID			-	-	-	-	-	-
Client Sample Location			WS4	WS4	WS4	WS4	WS10	WS10
Client Sample Type			B	B	D	D	D	D
Client Sample Number			2	4	7	11	8	12
Depth - Top (m)			0.20	0.80	1.70	3.70	2.00	4.00
Depth - Bottom (m)			0.50	1.00	2.00	4.00	3.00	5.00
Date of Sampling			24/03/2020	24/03/2020	24/03/2020	24/03/2020	24/03/2020	24/03/2020
Sample type			Disturbed	Disturbed	Disturbed	Disturbed	Disturbed	Disturbed
Sample Description			Brown silty gravelly slightly clayey sand	Brown slightly gravelly silty clay with occasional organic matter	Brown slightly silty clay	Brown slightly silty clay	Brown silty sandy gravel	Brown clayey silt
Determinant	**Specification**	**Units**						
Moisture Content		(%)	-	20	24	23	13	22
Moisture Content Prep		-	-	3.2.3.2 (medium)	3.2.3.1 (fine)	3.2.3.1 (fine)	3.2.3.2 (medium)	3.2.3.1 (fine)
Fines passing 425µm test sieve		(%)	-	88	-	-	-	100
Liquid Limit		(%)	-	52	-	-	-	38
Plastic Limit		(%)	-	26	-	-	-	Non Plastic
Plasticity Index		(%)	-	26	-	-	-	Non Plastic
PI preparation		-	-	from its natural state	-	-	-	from its natural state
PI Test Method			-	clause 4.4 (one point)	-	-	-	clause 4.4 (one point)
Linear Shrinkage		(%)	-	-	-	-	-	4.1
BS Test Sieve (mm)								
125.0		(% Passing)	100	-	-	-	100	-
90.0		(% Passing)	100	-	-	-	100	-
75.0		(% Passing)	100	-	-	-	100	-
63.0		(% Passing)	100	-	-	-	100	-
50.0		(% Passing)	100	-	-	-	100	-
37.5		(% Passing)	98	-	-	-	100	-
28.0		(% Passing)	92	-	-	-	97	-
20.0		(% Passing)	83	-	-	-	88	-
14.0		(% Passing)	76	-	-	-	82	-
10.0		(% Passing)	69	-	-	-	77	-
6.3		(% Passing)	62	-	-	-	71	-
5.0		(% Passing)	58	-	-	-	66	-
3.35		(% Passing)	54	-	-	-	62	-
2.00		(% Passing)	49	-	-	-	57	-
1.18		(% Passing)	46	-	-	-	53	-
0.600		(% Passing)	42	-	-	-	44	-
0.425		(% Passing)	38	-	-	-	37	-
0.300		(% Passing)	35	-	-	-	31	-
0.212		(% Passing)	33	-	-	-	27	-
0.150		(% Passing)	32	-	-	-	23	-
0.063		(% Passing)	31	-	-	-	17	-
PSD test Method		-	9.2 Wet Sieve	-	-	-	9.2 Wet Sieve	-

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

G19179-I/002

Project Reference - Boulton Moor Derby

Analytical Test Results - Soil

NC Reference			**86854**
Client Sample ID			-
Client Sample Location			WS10
Client Sample Type			D
Client Sample Number			15
Depth - Top (m)			5.50
Depth - Bottom (m)			6.00
Date of Sampling			24/03/2020
Sample type			Disturbed
Sample Description			Brown slightly silty clay
Determinant	**Specification**	**Units**	
Moisture Content		(%)	30
Moisture Content Prep		-	3.2.3.1 (fine)
Fines passing 425µm test sieve		(%)	-
Liquid Limit		(%)	-
Plastic Limit		(%)	-
Plasticity Index		(%)	-
PI preparation		-	-
PI Test Method			-
Linear Shrinkage		(%)	-
BS Test Sieve (mm)			
125.0		(% Passing)	-
90.0		(% Passing)	-
75.0		(% Passing)	-
63.0		(% Passing)	-
50.0		(% Passing)	-
37.5		(% Passing)	-
28.0		(% Passing)	-
20.0		(% Passing)	-
14.0		(% Passing)	-
10.0		(% Passing)	-
6.3		(% Passing)	-
5.0		(% Passing)	-
3.35		(% Passing)	-
2.00		(% Passing)	-
1.18		(% Passing)	-
0.600		(% Passing)	-
0.425		(% Passing)	-
0.300		(% Passing)	-
0.212		(% Passing)	-
0.150		(% Passing)	-
0.063		(% Passing)	-
PSD test Method		-	-

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

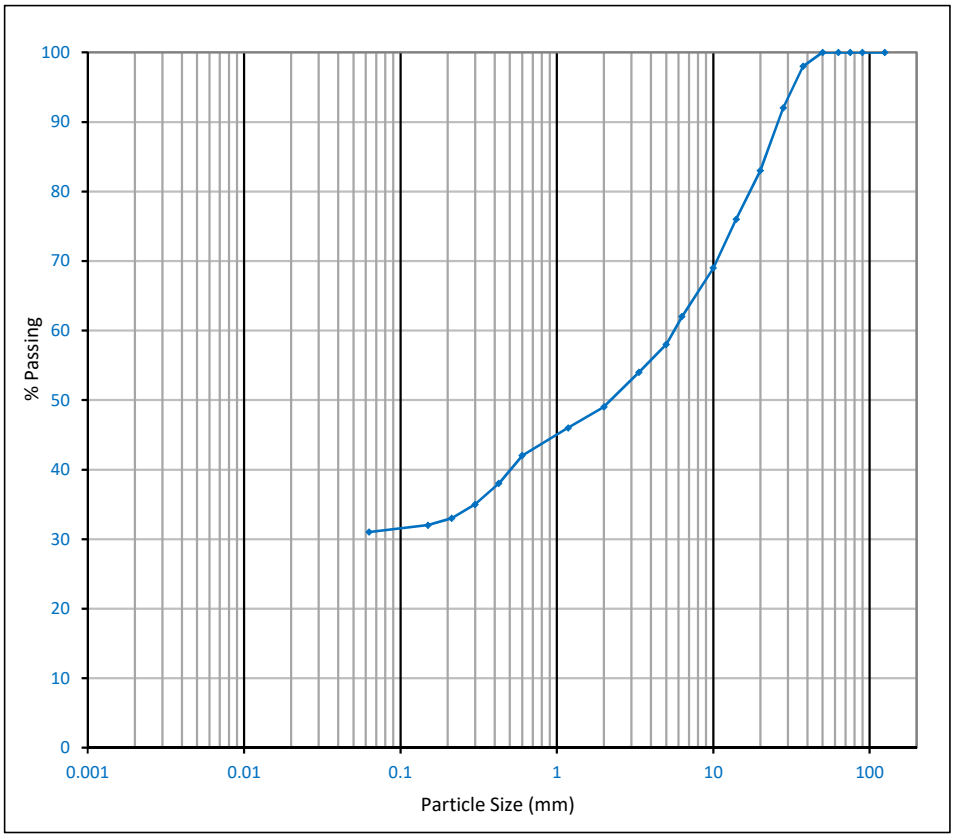
G19179-I/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86848**

Client Sample ID	-
Client Sample Location	WS4
Client Sample Type	B
Client Sample Number	2
Depth - Top (m)	0.20
Depth - Bottom (m)	0.50
Date of Sampling	24/03/2020
Sample type	Disturbed
Sample Description	Brown silty gravelly slightly clayey sand



Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	98	
28	92	
20	83	
14	76	
10	69	
6.3	62	
5	58	
3.35	54	46
2	49	Sand
1.18	46	
0.6	42	
0.425	38	
0.3	35	
0.212	33	
0.15	32	
0.063	31	23
		Fines 31

NOTES :

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

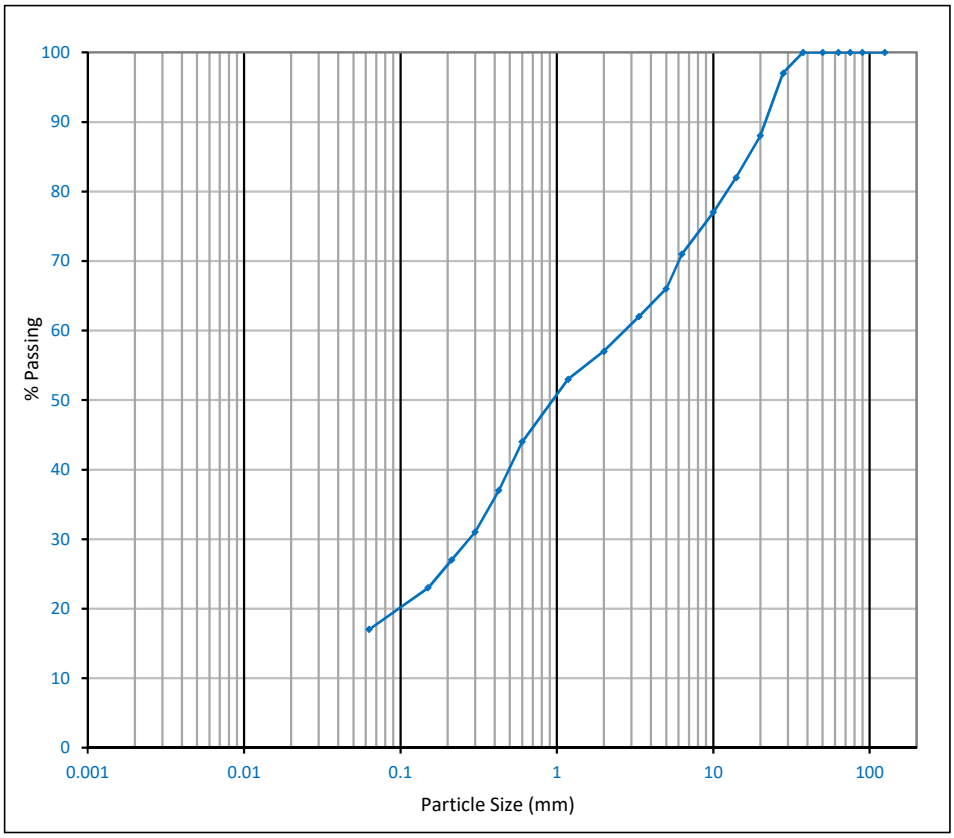
G19179-I/002

Project Reference - Boulton Moor Derby

Material Analysis Results

NC Reference	**86852**

Client Sample ID	-
Client Sample Location	WS10
Client Sample Type	D
Client Sample Number	8
Depth - Top (m)	2.00
Depth - Bottom (m)	3.00
Date of Sampling	24/03/2020
Sample type	Disturbed
Sample Description	Brown silty sandy gravel

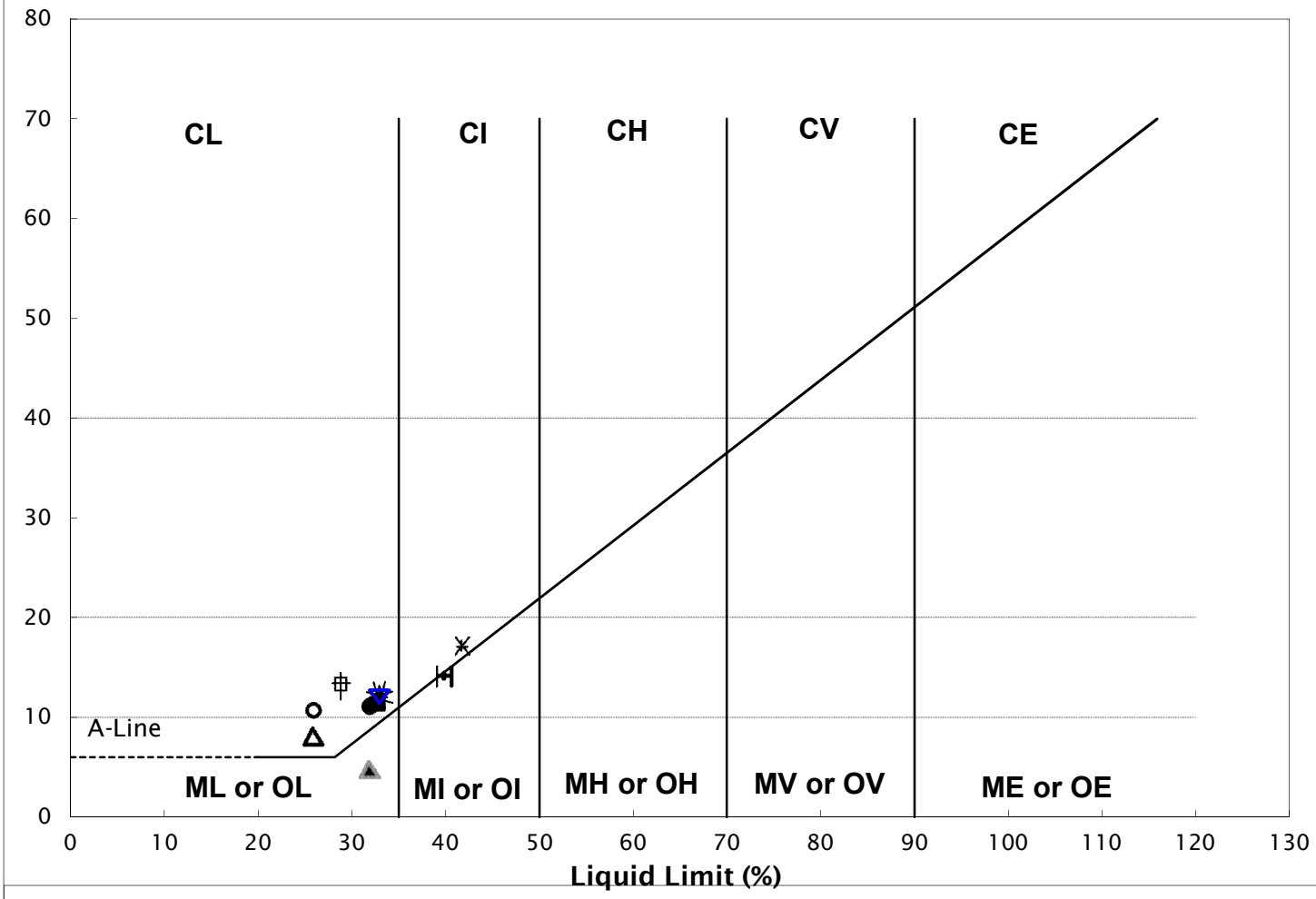


Sieve Size (mm)	Passing (%)	
125	100	Cobbles
90	100	
75	100	
63	100	0
50	100	Gravel
37.5	100	
28	97	
20	88	
14	82	
10	77	
6.3	71	
5	66	
3.35	62	38
2	57	Sand
1.18	53	
0.6	44	
0.425	37	
0.3	31	
0.212	27	
0.15	23	
0.063	17	45
		Fines 17

NOTES :

CASAGRANDE PLASTICITY CHART

Plasticity Index on Solid Geology Soils Test Orders G19179A-G19179-B



LEGENDS

A B C D E F G H I J K

CASAGRANDE CLASSIFICATION

The fine grained soils are divided into the following groups and further subdivided on the basis of Liquid Limits:

SOIL GROUPS

C Inorganic clays (these plot *above* the A-Line)

M Inorganic silts (these plot *below* the A-Line)

O Organic silts and clays (these plot *below* the A-Line)

PLASTICITY SUB-GROUPS

L **Low :** less than 35%
I **Intermediate** : 35% to 50%
H **High :** 50% to 70%
V **Very high :** 70% to 90%
E **Extremely high :** more than 90%

SHRINKAGE POTENTIAL

NHBC 'Building Near Trees' Chapter 4.2
classifies shrinkable soils as having more than 35% fine particles (silt and clay) and further subdivides such soils into four categories of heave and shrinkage potential based on Plasticity Index:

HIGH PI > 40 **MEDIUM** PI = 20 - 40 **LOW** PI = 10 - 20 **NON-SHRINKABLE** PI < 10

Remarks: Samples WS8 D10 3.60m-4.00m, WS9 D12 5.00m-5.50m & BH2 D8 5.85m tested as non-plastic. and linear shrinklage values used to calculate plasticity index using 2.13 x L.S.

Project : Boulton Moor, Derby.

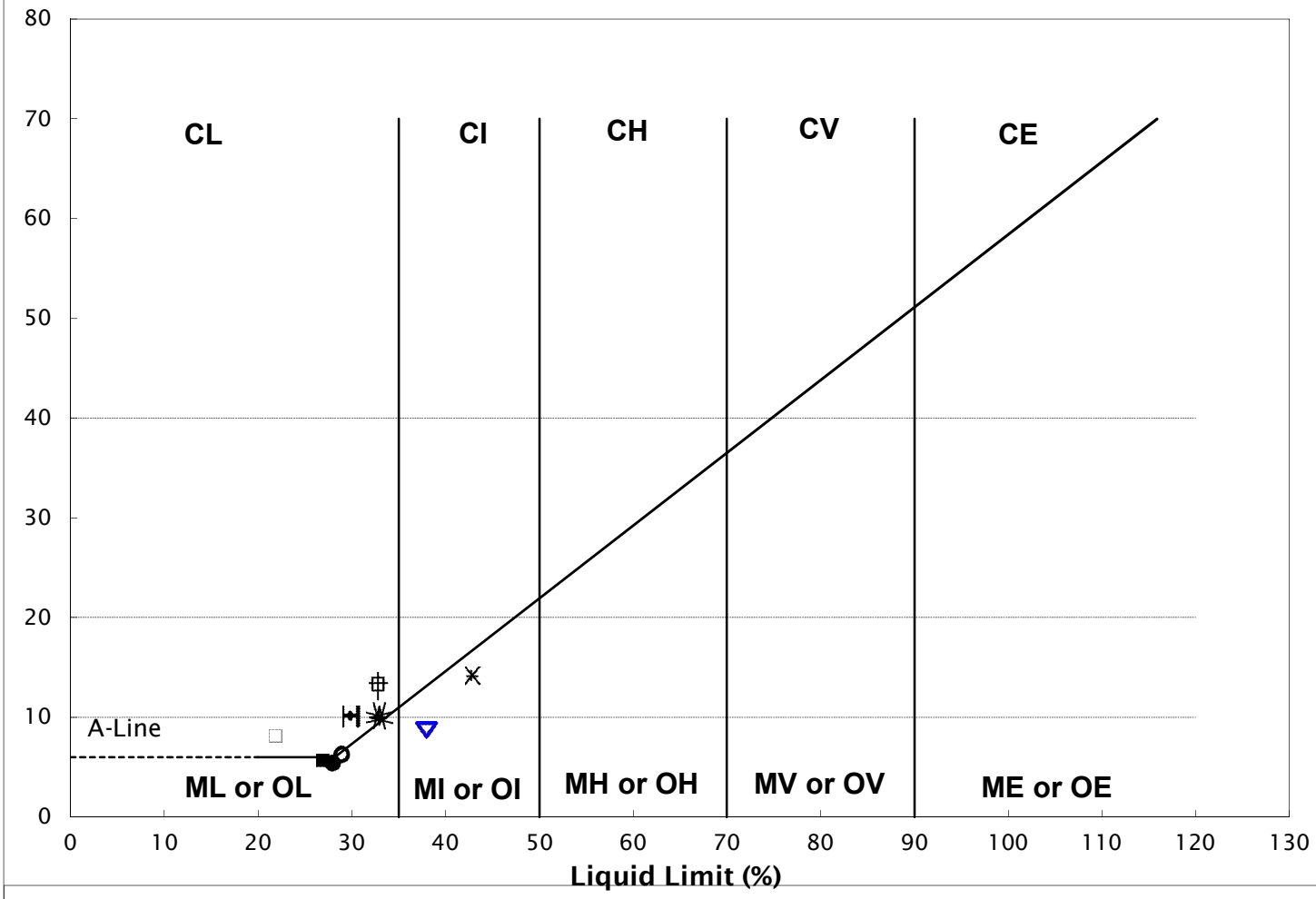
Client : Persimmon Homes.

Project No.
G19179

NICHOLLS COLTON GROUP

CASAGRANDE PLASTICITY CHART

Plasticity Index on Solid Geology Soils Test Orders G19179-B, F , H & I



LEGENDS

A B C D E F G H I J K

CASAGRANDE CLASSIFICATION

The fine grained soils are divided into the following groups and further subdivided on the basis of Liquid Limits:

SOIL GROUPS

C Inorganic clays (these plot *above* the A-Line)

M Inorganic silts (these plot *below* the A-Line)

O Organic silts and clays (these plot *below* the A-Line)

PLASTICITY SUB-GROUPS

L **Low :** less than 35%
I **Intermediate** : 35% to 50%
H **High :** 50% to 70%
V **Very high :** 70% to 90%
E **Extremely high :** more than 90%

SHRINKAGE POTENTIAL

NHBC 'Building Near Trees' Chapter 4.2
classifies shrinkable soils as having more than 35% fine particles (silt and clay) and further subdivides such soils into four categories of heave and shrinkage potential based on Plasticity Index:

HIGH PI > 40 **MEDIUM** PI = 20 - 40 **LOW** PI = 10 - 20 **NON-SHRINKABLE** PI < 10

Remarks: Samples BH3 D10 3.50m-4.00m, WS1 D12 2.50m-3.00m , WS2 D11 3.30m-3.70m & WS10 D12 4.00m-5.00m tested as non-plastic. and linear shrinklage values used to calculate plasticity index using 2.13 x L.S.

Project : Boulton Moor, Derby.

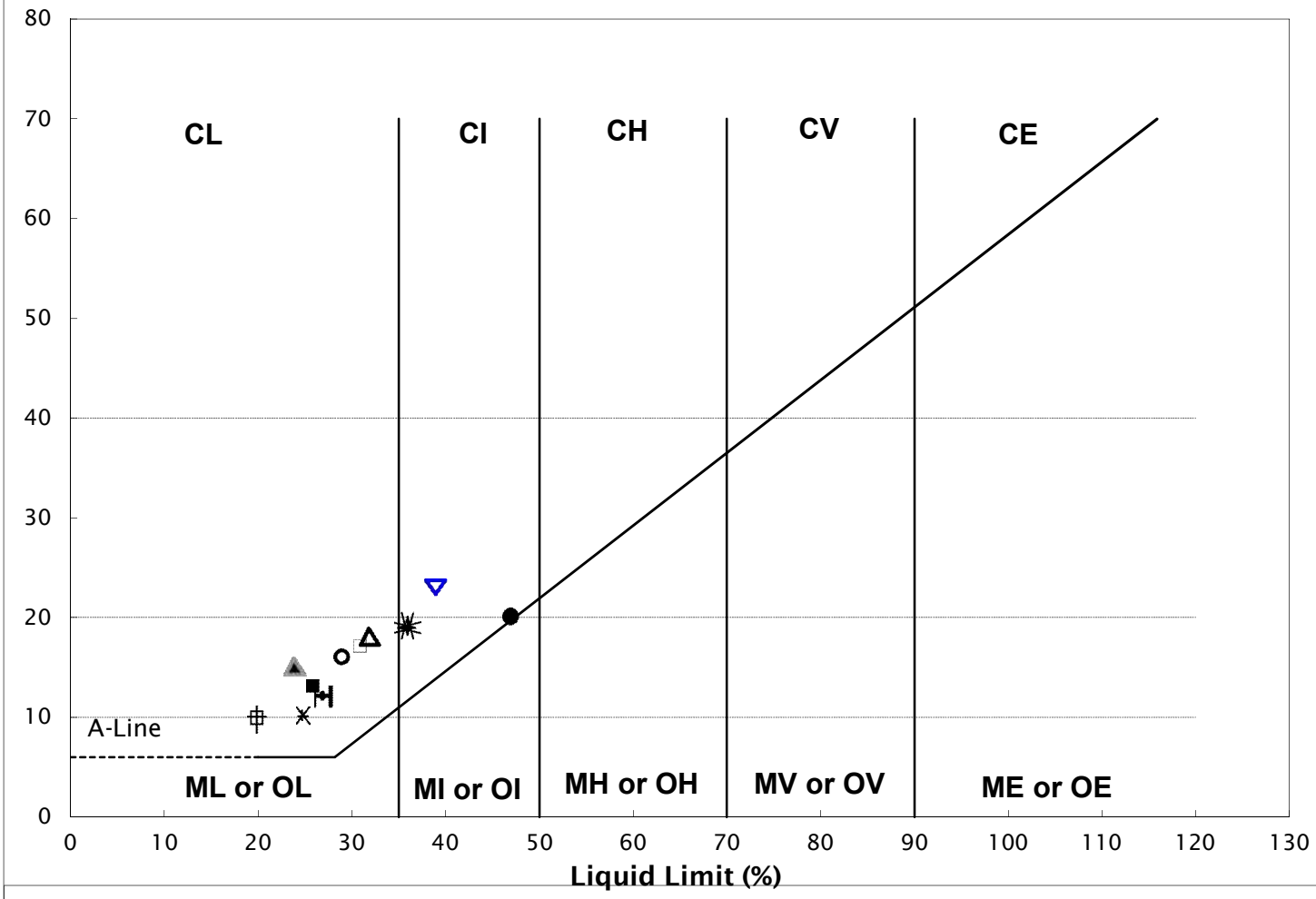
Client : Persimmon Homes.

Project No.
G19179

NICHOLLS COLTON GROUP

CASAGRANDE PLASTICITY CHART

Plasticity Index on Superficial Deposits & Made Ground Test Orders G19179-B, C & D.



LEGENDS

A B C D E F G H I J K

CASAGRANDE CLASSIFICATION

The fine grained soils are divided into the following groups and further subdivided on the basis of Liquid Limits:

SOIL GROUPS

C Inorganic clays (these plot *above* the A-Line)

M Inorganic silts (these plot *below* the A-Line)

O Organic silts and clays (these plot *below* the A-Line)

PLASTICITY SUB-GROUPS

L **Low :** less than 35%
I **Intermediate** : 35% to 50%
H **High :** 50% to 70%
V **Very high :** 70% to 90%
E **Extremely high :** more than 90%

SHRINKAGE POTENTIAL

NHBC 'Building Near Trees' Chapter 4.2
classifies shrinkable soils as having more than 35% fine particles (silt and clay) and further subdivides such soils into four categories of heave and shrinkage potential based on Plasticity Index:

HIGH PI > 40 **MEDIUM** PI = 20 - 40 **LOW** PI = 10 - 20 **NON-SHRINKABLE** PI < 10

Remarks: Samples taken from borehole WS11 (D11 3.00m to 4.00m) and BH8 (D17 7.00-7.50m proved to be non plastic PI calculated from LS X 2.13. Sample from BH4 B7 1.20m-2.00m comprises made ground..

Project : Boulton Moor, Derby.

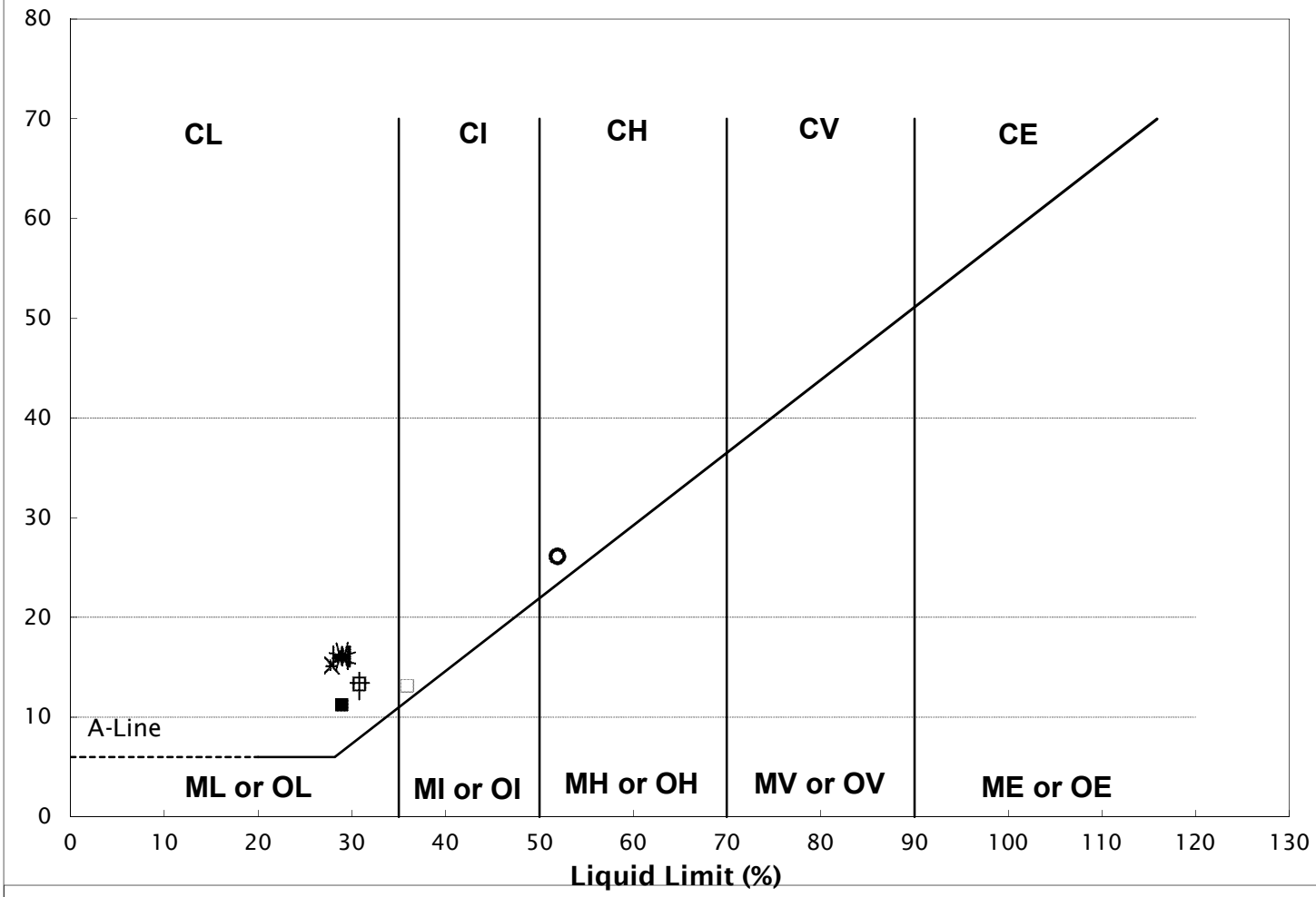
Client : Persimmon Homes.

Project No.
G19179

NICHOLLS COLTON GROUP

CASAGRANDE PLASTICITY CHART

Plasticity Index on Superficial Deposits & Made Ground Test Orders G19179-G, H & I



LEGENDS

A B C D E F G H I J K

CASAGRANDE CLASSIFICATION

The fine grained soils are divided into the following groups and further subdivided on the basis of Liquid Limits:

SOIL GROUPS

C Inorganic clays (these plot *above* the A-Line)

M Inorganic silts (these plot *below* the A-Line)

O Organic silts and clays (these plot *below* the A-Line)

PLASTICITY SUB-GROUPS

L **Low :** less than 35%
I **Intermediate** : 35% to 50%
H **High :** 50% to 70%
V **Very high :** 70% to 90%
E **Extremely high :** more than 90%

SHRINKAGE POTENTIAL

NHBC 'Building Near Trees' Chapter 4.2
classifies shrinkable soils as having more than 35% fine particles (silt and clay) and further subdivides such soils into four categories of heave and shrinkage potential based on Plasticity Index:

HIGH PI > 40 **MEDIUM** PI = 20 - 40 **LOW** PI = 10 - 20 **NON-SHRINKABLE** PI < 10

Remarks: Samples taken from borehole WS11(D11 3.00m to 4.00m) and BH8 (D17 7.00-7.50m) proved to be non plastic PI calculated from LS X 2.13. Sample from BH4 B7 1.20m-2.00m comprises made ground..

Project : Boulton Moor, Derby.

Client : Persimmon Homes.

Project No.
G19179

NICHOLLS COLTON GROUP

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006 In-house Technical Procedure TP35

DETERMINATION OF POINT LOAD STRENGTH ON ROCK

Sample details				Point Load test												
Borehole Ref.	Sample Ref.	Depth (m)	Description	D. Tested	Test type & Direction		Sample width W (mm)	Platen separation (mm)		Water Content (%)	Equiv. Diameter D_e (mm)	Failure Load P (kN)	I_s P/De² (MPa)	Correction Factor F	Point Load Index $I_{s(50)}$ (MPa)
								Start D	End D'						
BH2R	C1	12.75 - 12.84	Very weak thinly laminated dark brown SILTSTONE. Highly weathered.	22/04/20	D	Pl	84.5	85.1	83.3		84.2	0.15	0.02	1.26	0.03*
BH2R	C3	13.50 - 13.59	Weak to very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.	22/04/20	D	Pl	85.1	84.7	83.6		84.1	0.28	0.04	1.26	0.05*
BH2R	C4	14.35 - 14.50	Weak to very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.	22/04/20	D	Pl	85.4	85.3	81.4		83.3	2.18	0.31	1.26	0.39
BH2R	C5	14.85 - 15.05	Weak to very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.	22/04/20	D	Pl	85.6	86.1	84.1		85.1	1.01	0.14	1.27	0.18*
BH2R	C7	15.40 - 15.67	Weak thinly laminated grey fine grained SANDSTONE. Moderately weathered.	22/04/20	D	Pl	85.6	84.5	82.0		83.2	2.19	0.32	1.26	0.4
BH2R	C8	15.80 - 15.94	Weak thinly laminated grey fine grained SANDSTONE. Moderately weathered.	22/04/20	D	Pl	85.6	86.1	81.4		83.7	2.21	0.31	1.26	0.39

(*) Sample failed on weakness

Test type and direction: **D** - Diametral **A** - Axial **B** - Block **L** - Irregular lump **Pd** - Perpendicular to planes of weakness **R** - Random or unknown orientation **Pl** - Parallel to planes of weakness

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

GEOLABS

UKAS TESTING 1002

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Sample details						Density		Uniaxial Compression Test (LF0879C (1000kN) compression frame used)							
Borehole Ref.	Sample Ref.	Depth (m)	Description	MC (%)	Degree of Saturation (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Mean after prep. Diameter (mm)	Mean after prep. Height (mm)	H/D Ratio	Load at Failure (kN)	UCS (MPa) 3 sig. fig.	Failure Sketch	D. Tested	Remarks
BH1R	C1	13.30 - 13.50	Very weak thinly laminated grey fine grained SANDSTONE. Moderately weathered.	15	100	2.23	1.94	86.30	193.60	2.2	16.2	2.77		22/04/20	
BH1R	C2	14.74 - 15.00	Very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.	13	97.2	2.24	1.98	85.00	190.10	2.2	22.7	4		22/04/20	
BH2R	C2	13.20 - 13.49	Very weak thinly laminated greenish grey and dark brown SILTSTONE. Moderately to highly weathered.	21	100	2.16	1.79	86.30	246.20	2.9	12.1	2.07		22/04/20	
BH2R	C6	15.15 - 15.40	Very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.	5.5	82.3	2.41	2.29	86.80	218.40	2.5	80.2	13.6		22/04/20	

Note: The dimensional requirements of flatness (<0.02 mm), perpendicularity (<0.05 / 50 mm) and straightness (0.3 mm deviation) are not met. Specific Gravity used for Degree of Saturation is assumed unless specified by the client.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

GEOLABS

UKAS TESTING 1502

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

UNCONFINED COMPRESSIVE STRENGTH

Borehole Ref.:	BH1R
Sample Ref.:	C1
Depth (m):	13.30 - 13.50

Description:
Very weak thinly laminated grey fine grained SANDSTONE. Moderately weathered.

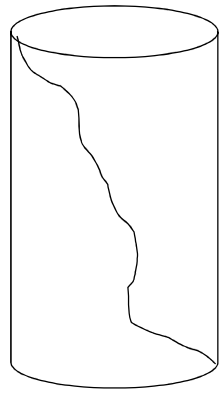
LF0879C (1000kN) compression frame used

Diameter	86.30 mm
Height	193.60 mm
Bulk Density	2.23 Mg/m³
Dry Density	1.94 Mg/m³
Water Content	15 %

Degree of Saturation: 100 % Specific Gravity: 2.7 Mg/m³ (Assumed)

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Horizontal: n/a
Angle of shear plane/Horizontal: 65°

Date tested: 22/04/2020

Test results

Unconfined Compressive Strength	2.77 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Sample type	**C**

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are not met.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

GEOLABS

UKAS

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

UNCONFINED COMPRESSIVE STRENGTH

Borehole Ref.:	BH1R
Sample Ref.:	C2
Depth (m):	14.74 - 15.00

Description:
Very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.

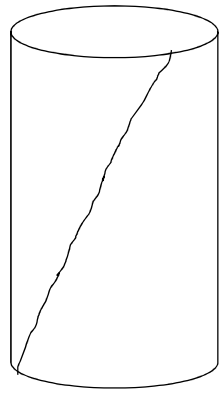
LF0879C (1000kN) compression frame used

Diameter	85.00 mm
Height	190.10 mm
Bulk Density	2.24 Mg/m³
Dry Density	1.98 Mg/m³
Water Content	13 %

Degree of Saturation: 97.2 % Specific Gravity: 2.7 Mg/m³ (Assumed)

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Horizontal: n/a
Angle of shear plane/Horizontal: 110º

Date tested: 22/04/2020

Test results

Unconfined Compressive Strength	4 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Sample type	**C**

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are not met.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

UNCONFINED COMPRESSIVE STRENGTH

Borehole Ref.:	BH2R
Sample Ref.:	C2
Depth (m):	13.20 - 13.49

Description:
Very weak thinly laminated greenish grey and dark brown SILTSTONE.
Moderately to highly weathered.

LF0879C (1000kN) compression frame used

Diameter	86.30 mm
Height	246.20 mm
Bulk Density	2.16 Mg/m³
Dry Density	1.79 Mg/m³
Water Content	21 %

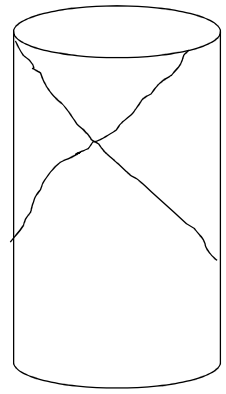
Degree of Saturation: 100 % Specific Gravity: 2.7 Mg/m³ (Assumed)

Test results

Unconfined Compressive Strength	2.07 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Failure Sketch

Mode of failure: Double shear



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Horizontal: n/a
Angle of shear plane/Horizontal: 65°

Sample type	**C**

Date tested: 22/04/2020

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are not met.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

UNCONFINED COMPRESSIVE STRENGTH

Borehole Ref.:	BH2R
Sample Ref.:	C6
Depth (m):	15.15 - 15.40

Description:
Very weak thinly laminated greenish grey and dark brown fine grained SANDSTONE. Moderately weathered.

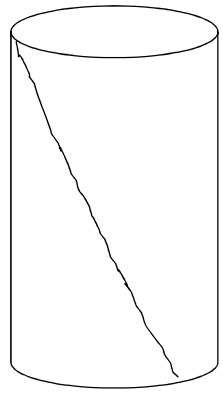
LF0879C (1000kN) compression frame used

Diameter	86.80 mm
Height	218.40 mm
Bulk Density	2.41 Mg/m³
Dry Density	2.29 Mg/m³
Water Content	5.5 %

Degree of Saturation: 82.3 % Specific Gravity: 2.7 Mg/m³ (Assumed)

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Horizontal: n/a
Angle of shear plane/Horizontal: 60°

Date tested: 22/04/2020

Test results

Unconfined Compressive Strength	13.6 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Sample type	**C**

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are not met.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 01/05/2020

Project Number:

GEO / 30971

Project Name:

BOULTON MOOR, DERBY
G19179

APPENDIX G

Laboratory Test Results - Chemical

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

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

Analytical Test Report: G19179-A/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	22/01/2020
Your Order Number:	G19179-A	Testing Instruction Received:	22/01/2020
Report Issue Number:	1	Sample Tested:	22/01 to 30/01/2020
Samples Analysed:	14 soil samples	Report issued:	03/02/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-A\[G19179-A-001.xlsx]BRE Suite

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

G19179-A/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			71880	71881	71882	71883	71884	71885	71886
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			WS5	WS5	WS5	WS6	WS6	WS6	WS7
Client Sample Type			E	D	SD	E	D	D	E
Client Sample Number			1	11	14	1	8	14	1
Depth - Top (m)			0.20	3.00	5.00	0.20	3.50	6.50	0.10
Depth - Bottom (m)			0.30	4.00	5.36	0.20	4.00	7.00	0.10
Date of Sampling			12/12/2019	13/12/2019	13/12/2019	12/12/2019	12/12/2019	12/12/2019	10/12/2019
Time of Sampling			pm	am	am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate	(mg/l)	u	< 10	< 10	< 10	< 10	21	23	< 10
Acid Soluble Sulphate	(%)	u	-	0.12	0.07	-	0.09	0.10	-
Total Sulphur	(%)	u	-	0.02	< 0.01	-	0.02	0.02	-
pH Value	pH Units	MCERTS	7.1	8.6	8.7	7.5	8.7	8.5	7.3

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

G19179-A/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			71887	71888	71889	71890	71891	71892	71893
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			WS7	WS8	WS8	WS8	WS9	WS9	WS9
Client Sample Type			D	E	SD	SD	E	D	SD
Client Sample Number			11	1	13	16	1	8	13
Depth - Top (m)			4.70	0.20	5.00	7.00	0.20	3.50	5.50
Depth - Bottom (m)			5.00	0.20	5.45	7.45	0.20	4.00	5.92
Date of Sampling			10/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019
Time of Sampling			am	am	am	am	am	am	pm
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate	(mg/l)	u	21	< 10	24	36	< 10	15	81
Acid Soluble Sulphate	(%)	u	0.09	-	0.07	0.15	-	0.10	0.12
Total Sulphur	(%)	u	0.02	-	0.01	0.04	-	0.02	0.03
pH Value	pH Units	MCERTS	8.6	7.2	8.4	8.5	7.7	8.9	9.1

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

G19179-A/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
71880	-	WS5	E	1	Brown slightly sandy slightly gravelly clay with rare rootlets	81
71881	-	WS5	D	11	Reddish brown slightly gravelly silty clay	100
71882	-	WS5	SD	14	Reddish brown slightly gravelly silty clay	100
71883	-	WS6	E	1	Brown slightly sandy slightly gravelly silty clay with rare rootlets	78
71884	-	WS6	D	8	Reddish brown slightly gravelly silty clay	82
71885	-	WS6	D	14	Reddish brown slightly gravelly silty clay	100
71886	-	WS7	E	1	Brown slightly gravelly sandy silty clay with frequent rootlets	83
71887	-	WS7	D	11	Reddish brown slightly gravelly clay	100
71888	-	WS8	E	1	Brown slightly sandy slightly gravelly silty clay with rare rootlets	78
71889	-	WS8	SD	13	Reddish brown slightly sandy silty clay	82
71890	-	WS8	SD	16	Reddish brown slightly sandy silty clay	82
71891	-	WS9	E	1	Brown slightly sandy slightly gravelly silty clay with rare rootlets	76
71892	-	WS9	D	8	Reddish brown slightly sandy silty clay	100
71893	-	WS9	SD	13	Reddish brown slightly sandy silty clay	96

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

G19179-A/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-B/001

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	05/02/2020
Your Order Number:	G19179-B	Testing Instruction Received:	05/02/2020
Report Issue Number:	1	Sample Tested:	05/02 to 19/02/2020
Samples Analysed:	14 soil samples	Report issued:	19/02/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-B\[G19179-B-001.xlsx]Cover Sheet

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

G19179-B/001

Project Reference - Boulton Moor Derby

Analytical Test Results - BRE Suite

NC Reference			73750	73751	73752	73753	73754	73755	73757
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			BH1	BH1	BH1	BH2	BH2	BH5	BH5
Client Sample Type			D	D	D	D	D	E	D
Client Sample Number			6	10	12	6	9	1	13
Depth - Top (m)			3.00	6.50	8.00	4.00	6.40	0.10	7.00
Depth - Bottom (m)			3.00	6.50	8.00	4.00	6.40	0.10	7.00
Date of Sampling			12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Time of Sampling			am	pm	pm	am	pm	am	am
Sample Matrix			Clay	Clay	Sand	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate	(mg/l)	u	17	17	20	14	20	< 10	30
Acid Soluble Sulphate	(%)	u	0.08	-	0.10	-	0.12	-	0.11
Total Sulphur	(%)	u	0.02	-	0.03	-	0.03	-	0.03
pH Value	pH Units	MCERTS	8.5	8.5	8.4	8.6	8.4	6.6	8.3

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

G19179-B/001

Project Reference - Boulton Moor Derby

Analytical Test Results - BRE Suite

NC Reference			73759	73760	73761	73762	73763
Client Sample ID			-	-	-	-	-
Client Sample Location			BH6	TT1	TT1	TT2	TT2
Client Sample Type			D	D	D	D	D
Client Sample Number			13	5	6	4	5
Depth - Top (m)			6.30	2.50	3.30	2.00	2.30
Depth - Bottom (m)			6.30	2.50	3.30	2.00	2.30
Date of Sampling			12/12/2020	12/12/2020	12/12/2020	12/12/2020	12/12/2020
Time of Sampling			am	am	am	pm	pm
Sample Matrix			Other	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**					
Water soluble sulphate	(mg/l)	u	24	34	17	< 10	27
Acid Soluble Sulphate	(%)	u	0.13	-	0.07	-	0.09
Total Sulphur	(%)	u	0.04	-	0.02	-	0.03
pH Value	pH Units	MCERTS	8.6	8.3	8.5	8.4	8.5

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

G19179-B/001

Project Reference - Boulton Moor Derby

Analytical Test Results - pH & Sulphate

NC Reference			**73756**	**73758**
Client Sample ID			-	-
Client Sample Location			BH5	BH6
Client Sample Type			W	W
Client Sample Number			5	4
Depth (m)			1.00	1.10
Date of Sampling			12/12/2020	12/12/2020
Time of Sampling			am	am
Sample Matrix			Water	Water
Determinant	**Units**	**Accreditation**		
pH	pH Units	u	7.5	7.5
Sulphate	(mg/l)	u	57	29

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

G19179-B/001

Project Reference - Boulton Moor Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
73750	-	BH1	D	6	Reddish brown slightly gravelly slightly silty sandy clay	64
73751	-	BH1	D	10	Reddish brown slightly gravelly sandy clay	67
73752	-	BH1	D	12	Brown very gravelly sand	40
73753	-	BH2	D	6	Brown gravelly slightly clayey sand with occasional organic matter	35
73754	-	BH2	D	9	Greyish brown slightly gravelly sandy clay	80
73755	-	BH5	E	1	Dark brown slightly gravelly slightly sandy silty clay with occasional rootlets organic matter	59
73757	-	BH5	D	13	Brown gravelly sandy clay	44
73759	-	BH6	D	13	Brown very sandy crushed rock	28
73760	-	TT1	D	5	Brown gravelly very sandy silty clay	60
73761	-	TT1	D	6	Reddish brown silty clay	83
73762	-	TT2	D	4	Greyish brown very silty sandy clay with rare organic matter	73
73763	-	TT2	D	5	Reddish brown slightly sandy silty clay	81

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

G19179-B/001

Project Reference - Boulton Moor Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP
Water	pH	As Received	BS 1377, Part 3, 1990
Water	Sulphate	As Received	In house method statement - MS - CL - Anions by Aquakem

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

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

Analytical Test Report: G19179-C/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	24/02/2020
Your Order Number:	G19179-C	Testing Instruction Received:	24/02/2020
Report Issue Number:	1	Sample Tested:	24/02 to 03/03/2020
Samples Analysed:	9 soil samples	Report issued:	04/03/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-C\[G19179-C-001.XLSX]Cover Sheet

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

G19179-C/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			78413	78414	78415	78416	78417	78418	78419
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			WS11	WS11	WS11	WS11	WS11	WS12	WS12
Client Sample Type			D	D	D	D	D	B	D
Client Sample Number			4	8	11	13	16	10	13
Depth - Top (m)			1.00	2.30	3.00	4.00	5.00	3.00	4.80
Depth - Bottom (m)			1.00	2.70	4.00	4.80	6.00	4.00	5.25
Date of Sampling			11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020	11/02/2020
Time of Sampling			AM	AM	AM	AM	AM	PM	PM
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate	(mg/l)	u	21	220	170	44	17	180	170
Acid Soluble Sulphate	(%)	u	-	-	-	-	0.03	-	-
Total Sulphur	(%)	u	-	-	-	-	0.01	-	-
pH Value	pH Units	MCERTS	7.7	8.2	8.4	8.4	8.7	8.4	8.4

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

G19179-C/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			78420	78421
Client Sample ID			-	-
Client Sample Location			WS12	WS13
Client Sample Type			D	SD
Client Sample Number			16	10
Depth - Top (m)			6.75	4.00
Depth - Bottom (m)			7.00	4.45
Date of Sampling			11/02/2020	11/02/2020
Time of Sampling			PM	AM
Sample Matrix			Clay	Clay
Determinant	**Units**	**Accreditation**		
Water soluble sulphate	(mg/l)	u	250	240
Acid Soluble Sulphate	(%)	u	0.11	-
Total Sulphur	(%)	u	0.07	-
pH Value	pH Units	MCERTS	8.8	8.7

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

G19179-C/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
78413	-	WS11	D	4	Orangish brown slightly silty very gravelly sandy clay	51
78414	-	WS11	D	8	Greyish brown slightly sandy slightly gravelly silty clay	78
78415	-	WS11	D	11	Greyish brown slightly silty slightly gravelly sandy clay	72
78416	-	WS11	D	13	Brown slightly silty slightly gravelly sandy clay	94
78417	-	WS11	D	16	Reddish brown slightly silty slightly gravelly sandy clay	97
78418	-	WS12	B	10	Greyish brown slightly sandy slightly gravelly silty clay	71
78419	-	WS12	D	13	Brown slightly silty slightly gravelly sandy clay	78
78420	-	WS12	D	16	Yellowish brown slightly silty very gravelly sandy clay	56
78421	-	WS13	SD	10	Brownish grey slightly sandy slightly gravelly silty clay	78

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

G19179-C/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-D/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	15/04/2020
Your Order Number:	G19179-D	Testing Instruction Received:	15/04/2020
Report Issue Number:	1	Sample Tested:	15/04 to 24/04/2020
Samples Analysed:	4 soil samples	Report issued:	24/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-D\[G19179-D-001.XLSX]BRE Suite

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

G19179-D/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			87013	87014	87015	87016
Client Sample ID			-	-	-	-
Client Sample Location			BH1R	BH1R	BH1R	BH2R
Client Sample Type			D	D	D	D
Client Sample Number			1	10	11	9
Depth - Top (m)			7.50	11.50	13.50	11.50
Depth - Bottom (m)			7.50	11.95	13.76	11.95
Date of Sampling			25/03/2020	25/03/2020	25/03/2020	18/03/2020
Time of Sampling			am	pm	pm	pm
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**				
Water soluble sulphate	(mg/l)	u	29	33	1400	60
Acid Soluble Sulphate	(%)	u	-	0.07	3.93	-
Total Sulphur	(%)	u	-	0.02	1.26	-
pH Value	pH Units	MCERTS	8.5	8.8	7.8	8.7

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

G19179-D/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
87013	-	BH1R	D	1	Mottled brown grey sandy silty clay	100
87014	-	BH1R	D	10	Mottled brown grey sandy silty clay	100
87015	-	BH1R	D	11	Mottled brown grey slightly sandy silty clay	100
87016		BH2R	D	9	Mottled brown grey sandy silty clay	100

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

G19179-D/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-E/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-E	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	10/04 to 23/04/2020
Samples Analysed:	4 soil samples	Report issued:	23/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-E\[G19179-E-001.XLSX]Cover Sheet

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

G19179-E/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			86788	86789	86790	86791
Client Sample ID			-	-	-	-
Client Sample Location			BH7R	BH7R	BH7R	BH7R
Client Sample Type			B	D	D	C
Client Sample Number			10	14	18	4
Depth - Top (m)			4.00	6.50	10.00	13.95
Depth - Bottom (m)			4.20	7.50	10.45	14.15
Date of Sampling			17/03/2020	24/03/2020	24/03/2020	24/03/2020
Time of Sampling			am	am	am	pm
Sample Matrix			Clay	Clay	Sand	Clay
Determinant	**Units**	**Accreditation**				
Water soluble sulphate	(mg/l)	u	250	57	82	2000
Acid Soluble Sulphate	(%)	u	-	-	0.13	-
Total Sulphur	(%)	u	-	-	0.04	-
pH Value	pH Units	MCERTS	8.5	8.9	8.5	8.6

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

G19179-E/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
86788	-	BH7R	B	10	Brown slightly sandy slightly gravelly clay	100
86789	-	BH7R	D	14	Mottled brown grey silty clay	100
86790	-	BH7R	D	18	Brown sand	100
86791	-	BH7R	C	4	Brown silty clay	100

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

G19179-E/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-F/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-F	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	10/04 to 23/04/2020
Samples Analysed:	10 soil samples	Report issued:	23/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-F\[G19179-F-001.XLSX]Cover Sheet

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

G19179-F/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			86797	86798	86799	86800	86801	86802	86803
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			BH3	BH3	BH3	BH3	BH4	BH4	BH4
Client Sample Type			D	D	B	D	B	D	D
Client Sample Number			6	10	14	15	7	14	17
Depth - Top (m)			1.80	3.50	5.50	6.50	1.20	3.70	5.70
Depth - Bottom (m)			2.00	4.00	6.00	6.94	2.00	4.00	6.00
Date of Sampling			23/02/2020	23/02/2020	23/02/2020	23/02/2020	19/03/2020	19/03/2020	20/03/2020
Time of Sampling			am	am	am	am	am	pm	am
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**							
Water soluble sulphate	(mg/l)	u	240	210	270	190	270	30	35
Acid Soluble Sulphate	(%)	u	-	-	-	0.11	-	-	-
Total Sulphur	(%)	u	-	-	-	0.03	-	-	-
pH Value	pH Units	MCERTS	8.2	8.5	8.6	8.8	7.5	8.8	8.9

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

G19179-F/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			86804	86805	86806
Client Sample ID			-	-	-
Client Sample Location			BH4	BH8	BH8
Client Sample Type			D	D	D
Client Sample Number			20	11	14
Depth - Top (m)			7.00	4.50	6.00
Depth - Bottom (m)			8.00	5.00	6.50
Date of Sampling			20/03/2020	18/03/2020	18/03/2020
Time of Sampling			am	am	am
Sample Matrix			Sand	Clay	Clay
Determinant	**Units**	**Accreditation**			
Water soluble sulphate	(mg/l)	u	120	250	310
Acid Soluble Sulphate	(%)	u	-	0.17	-
Total Sulphur	(%)	u	-	0.31	-
pH Value	pH Units	MCERTS	8.7	8.3	8.5

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

G19179-F/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
86797	-	BH3	D	6	Brown slightly sandy slightly gravelly clay	73
86798	-	BH3	D	10	Brown slightly sandy slightly gravelly silty clay	90
86799	-	BH3	B	14	Brown slightly sandy silty clay	100
86800	-	BH3	D	15	Brown silty clay	100
86801	-	BH4	B	7	Brown sandy slightly gravelly clay	62
86802	-	BH4	D	14	Brown slightly sandy silty clay	96
86803	-	BH4	D	17	Red sandy silt	100
86804	-	BH4	D	20	Brown very gravelly sand	56
86805	-	BH8	D	11	Brown slightly sandy slightly gravelly clay	98
86806	-	BH8	D	14	Brown slightly sandy slightly gravelly clay	100

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

G19179-F/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-G/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-G	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	10/04 to 21/04/2020
Samples Analysed:	4 soil samples	Report issued:	30/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

With the exception of Sulphate which is crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-G\[G19179-G-001.XLSX]BRE Suite

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

G19179-G/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - pH & Sulphate

NC Reference			86823	86824	86825	86826
Client Sample ID			-	-	-	-
Client Sample Location			BH9	BH9	BH10	BH10
Client Sample Type			D	D	D	B
Client Sample Number			12	18	13	25
Depth - Top (m)			4.50	8.00	4.45	11.10
Depth - Bottom (m)			4.60	8.38	4.50	11.50
Date of Sampling			19/03/2020	19/03/2020	20/03/2020	20/03/2020
Time of Sampling			am	am	am	pm
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**				
Water soluble sulphate	(mg/l)	u	420	400	230	610
pH Value	pH Units	MCERTS	8.2	8.4	8.5	8.6

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

G19179-G/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
86823	-	BH9	D	12	Brown slightly sandy slightly gravelly clay	89
86824	-	BH9	D	18	Brown slightly sandy slightly gravelly clay	94
86825	-	BH10	D	13	Brown slightly sandy slightly gravelly clay	98
86826	-	BH10	B	25	Brown slightly sandy slightly gravelly clay	96

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

G19179-G/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem

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

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

Analytical Test Report: G19179-H/001

Your Project Reference:	**Boulton Moor Derby**	Samples Received on:	15/04/2020
Your Order Number:	G19179-H	Testing Instruction Received:	15/04/2020
Report Issue Number:	1	Sample Tested:	15/04 to 24/04/2020
Samples Analysed:	6 soil samples	Report issued:	24/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-H\[G19179-H-001.XLSX]BRE Suite

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

G19179-H/001

Project Reference - Boulton Moor Derby

Analytical Test Results - BRE Suite

NC Reference			87017	87018	87019	87020	87021	87022
Client Sample ID			-	-	-	-	-	-
Client Sample Location			WS1	WS1	WS2	WS2	WS3	WS3
Client Sample Type			D	D	D	D	D	D
Client Sample Number			12	17	9	12	10	14
Depth - Top (m)			2.50	4.00	2.50	3.70	2.60	4.00
Depth - Bottom (m)			3.00	5.00	3.00	4.00	3.00	4.45
Date of Sampling			23/03/2020	23/03/2020	24/03/2020	24/03/2020	23/03/2020	23/03/2020
Time of Sampling			am	am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Sand	Clay
Determinant	**Units**	**Accreditation**						
Water soluble sulphate	(mg/l)	u	53	100	26	190	52	23
Acid Soluble Sulphate	(%)	u	-	-	0.07	-	-	-
Total Sulphur	(%)	u	-	-	0.02	-	-	-
pH Value	pH Units	MCERTS	8.7	8.6	8.7	8.4	8.4	8.7

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

G19179-H/001

Project Reference - Boulton Moor Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
87017	-	WS1	D	12	Brown sandy silty clay	100
87018	-	WS1	D	17	Brown slightly sandy silty clay	100
87019	-	WS2	D	9	Mottled grey brown very sandy silty clay	100
87020	-	WS2	D	12	Mottled grey brown slightly sandy silty clay	100
87021	-	WS3	D	10	Brown very gravelly sand	30
87022	-	WS3	D	14	Reddish brown sandy silty clay	94

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

G19179-H/001

Project Reference - Boulton Moor Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

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

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

Analytical Test Report: G19179-I/001

Your Project Reference:	**Boulton Moor, Derby**	Samples Received on:	10/04/2020
Your Order Number:	G19179-I	Testing Instruction Received:	09/04/2020
Report Issue Number:	1	Sample Tested:	10/04 to 23/04/2020
Samples Analysed:	5 soil samples	Report issued:	23/04/2020

Signed

Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

With the exception of Sulphate & Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**Yes**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
J:\Public\Projects\2020\LE3 - Geotechnical\G19\G19179-I\[G19179-I-001.XLSX]Cover Sheet

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

G19179-I/001

Project Reference - Boulton Moor, Derby

Analytical Test Results - BRE Suite

NC Reference			86843	86844	86845	86846	86847
Client Sample ID			-	-	-	-	-
Client Sample Location			WS4	WS4	WS10	WS10	WS10
Client Sample Type			D	D	D	D	D
Client Sample Number			5	13	11	12	16
Depth - Top (m)			1.20	4.70	4.00	4.00	6.00
Depth - Bottom (m)			1.65	5.00	4.45	5.00	6.45
Date of Sampling			24/03/2020	24/03/2020	24/03/2020	24/03/2020	24/03/2020
Time of Sampling			am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**					
Water soluble sulphate	(mg/l)	u	120	36	37	95	21
Acid Soluble Sulphate	(%)	u	-	-	0.10	-	-
Total Sulphur	(%)	u	-	-	0.03	-	-
pH Value	pH Units	MCERTS	8.5	8.8	8.8	8.8	8.8

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

G19179-I/001

Project Reference - Boulton Moor, Derby

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Passing 2mm test sieve (%)
86843	-	WS4	D	5	Brown slightly sandy slightly gravelly clay	85
86844	-	WS4	D	13	Brown slightly sandy clay	100
86845	-	WS10	D	11	Mottled grey brown slightly sandy clay	100
86846	-	WS10	D	12	Mottled grey brown slightly sandy clay	100
86847	-	WS10	D	16	Brown slightly sandy clay	100

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

G19179-I/001

Project Reference - Boulton Moor, Derby

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP

APPENDIX H

Gas & Groundwater Monitoring Results

MONITORING REPORT

SITE: Boulton Moor

GAS AND GROUNDWATER MONITORING RESULTS

Date		14/01/20	10/02/20	02/04/20	08/04/20		
Monitored By		RL	NB	AW	AW		
Time Start		08:18	12.20	9.02	9.15		
Gas Monitoring Unit		HIRE	GGAS105	GGAS105	GGAS105		
Unit Serial Number		G501374	G501285	G501285	G501285		
Dipmeter		6	6	5	5		
Weather		Dry	Wet & Windy	Sunny	Sunny		
Pressure Trend		Steady	Falling	Rising	Rising		
BH1	Time		08:18	12.20	9.42	9.59	
	Barometric Pressure (mb)		991	987	1011	1020	
	Relative Pressure (mb)		0.05	-0.64	0.02	0.00	
	Flow (l/hr)	Peak	0.0	0.0	0.0	0.0	
		Steady	0.0	0.0	0.0	0.0	
	Methane	Peak	0.0	0.0	0.0	0.0	
	(% v/v)	Steady	0.0	0.0	0.0	0.0	
	Methane	Peak	0.0	0.0	0.0	0.0	
	(% LEL)	Steady	0.0	0.0	0.0	0.0	
	Carbon	Peak	1.4	2.8	4.9	5.1	
	Dioxide (% v/v)	Steady	1.1	2.8	4.9	5.1	
	Oxygen	Min	17.4	16.4	11.2	10.9	
	(% v/v)	Steady	17.4	16.4	11.2	10.9	
	Hydrogen	Peak	0	0	0	0	
	Sulphide (ppm)	Steady	0	0	0	0	
	Carbon	Peak	0	0	0	0	
	Monoxide (ppm)	Steady	0	0	0	0	
	Groundwater Level (m bgl)		1.29	1.54	1.59	1.59	
	Pipe depth (m bgl)		6.93	6.90	6.82	6.82	
BH2	Time		09:09	13.30	9.02	9.15	
	Barometric Pressure (mb)		991	986	1010	1021	
	Relative Pressure (mb)		0.14	-4.57	0.07	0.04	
	Flow (l/hr)	Peak	0.0	0.0	0.0	0.0	
		Steady	0.0	0.0	0.0	0.0	
	Methane	Peak	0.0	0.0	0.0	0.0	
	(% v/v)	Steady	0.0	0.0	0.0	0.0	
	Methane	Peak	0.0	0.0	0.0	0.0	
	(% LEL)	Steady	0.0	0.0	0.0	0.0	
	Carbon	Peak	0.1	1.4	2.5	1.7	
	Dioxide (% v/v)	Steady	0.1	1.4	2.5	1.7	
	Oxygen	Min	20.0	14.7	10.6	20.4	
	(% v/v)	Steady	20.0	14.7	10.6	20.4	
	Hydrogen	Peak	1	0	0	0	
	Sulphide (ppm)	Steady	1	0	1	1	
	Carbon	Peak	0	2	0	0	
	Monoxide (ppm)	Steady	0	2	0	0	
	Groundwater Level (m bgl)		1.54	1.80	1.91	1.46	
	Pipe depth (m bgl)		5.63	5.50	5.43	5.43	

MONITORING REPORT

SITE: Boulton Moor

GAS AND GROUNDWATER MONITORING RESULTS

Date			14/01/20	10/02/20	02/04/20	08/04/20		
Monitored By			RL	NB	AW	AW		
Time Start			8.18	12.20	9.02	9.15		
Gas Monitoring Unit			HIRE	GGAS105	GGAS105	GGAS105		
Unit Serial Number			G501374	G501285	G501285	G501285		
Dipmeter			6	6	5	5		
Weather			Dry	Windy &	Sunny	Sunny		
Pressure Trend			Steady	Falling	Rising	Rising		
BH4	Time				9.12	9.27		
	Barometric Pressure (mb)				1011	1020		
	Relative Pressure (mb)				-0.07	-0.05		
	Flow (l/hr)	Peak			0.0	0.0		
		Steady			0.0	0.0		
	Methane	Peak	Not	Not	0.1	0.0		
	(% v/v)	Steady	Installed	Installed	0.1	0.0		
	Methane	Peak			2.0	0.0		
	(% LEL)	Steady			2.0	0.0		
	Carbon	Peak			1.1	1.3		
	Dioxide (% v/v)	Steady			1.1	1.3		
	Oxygen	Min			20.0	19.8		
	(% v/v)	Steady			20.0	19.8		
	Hydrogen	Peak			0	0		
	Sulphide (ppm)	Steady			1	0		
	Carbon	Peak			0	0		
	Monoxide (ppm)	Steady			1	0		
	Groundwater Level (m bgl)				1.34	1.33		
	Pipe depth (m bgl)				9.76	9.76		
BH8	Time				9.32	9.47		
	Barometric Pressure (mb)				1011	1020		
	Relative Pressure (mb)				0.05	0.00		
	Flow (l/hr)	Peak			0.0	0.0		
		Steady			0.0	0.0		
	Methane	Peak	Not	Not	0.0	0.0		
	(% v/v)	Steady	Installed	Installed	0.0	0.0		
	Methane	Peak			0.0	0.0		
	(% LEL)	Steady			0.0	0.0		
	Carbon	Peak			1.6	1.5		
	Dioxide (% v/v)	Steady			1.6	1.5		
	Oxygen	Min			20.2	20.1		
	(% v/v)	Steady			20.2	20.1		
	Hydrogen	Peak			0	0		
	Sulphide (ppm)	Steady			0	0		
	Carbon	Peak			0	0		
	Monoxide (ppm)	Steady			0	0		
	Groundwater Level (m bgl)				1.46	1.44		
	Pipe depth (m bgl)				10.11	10.11		

MONITORING REPORT

SITE: Boulton Moor

GAS AND GROUNDWATER MONITORING RESULTS

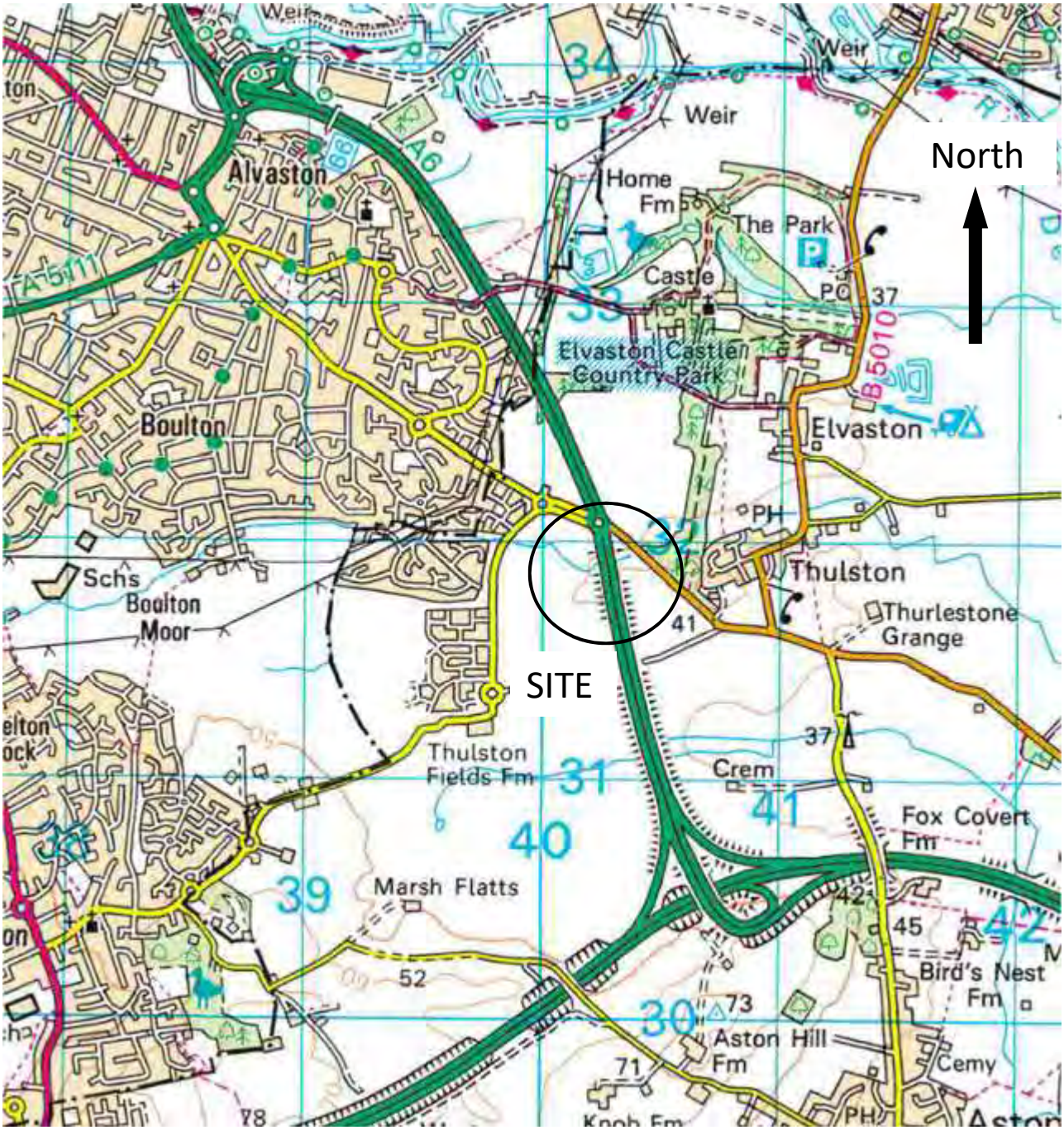
Date			14/01/20	10/02/20	02/04/20	08/04/20		
Monitored By			RL	NB	AW	AW		
Time Start			8.18	12.20	9.02	9.15		
Gas Monitoring Unit			HIRE	GGAS105	GGAS105	GGAS105		
Unit Serial Number			G501374	G501285	G501285	G501285		
Dipmeter			6	6	5	5		
Weather			Dry	Windy &	Sunny	Sunny		
Pressure Trend			Steady	Falling	Rising	Rising		
BH10	Time				12:57	02:52		
	Barometric Pressure (mb)				1010	1021		
	Relative Pressure (mb)				-0.1	0.0		
	Flow (l/hr)	Peak			0.0	0.0		
		Steady			0.0	0.0		
	Methane	Peak	Not	Not	0.0	0.0		
	(% v/v)	Steady	Installed	Installed	0.0	0.0		
	Methane	Peak			0.0	0.0		
	(% LEL)	Steady			0.0	0.0		
	Carbon	Peak			1.2	1.1		
	Dioxide (% v/v)	Steady			1.2	1.1		
	Oxygen	Min			20.3	20.1		
	(% v/v)	Steady			20.3	20.1		
	Hydrogen	Peak			0	0		
	Sulphide (ppm)	Steady			0	0		
	Carbon	Peak			0	0		
	Monoxide (ppm)	Steady			0	0		
	Groundwater Level (m bgl)				2.09	2.08		
	Pipe depth (m bgl)				14.99	14.99		
	Time							
	Barometric Pressure (mb)							
	Relative Pressure (mb)							
	Flow (l/hr)	Peak						
		Steady						
	Methane	Peak						
	(% v/v)	Steady						
	Methane	Peak						
	(% LEL)	Steady						
	Carbon	Peak						
	Dioxide (% v/v)	Steady						
	Oxygen	Min						
	(% v/v)	Steady						
	Hydrogen	Peak						
	Sulphide (ppm)	Steady						
	Carbon	Peak						
	Monoxide (ppm)	Steady						
	Groundwater Level (m bgl)							
	Pipe depth (m bgl)							

DRAWINGS

G19179-IR/01 Site Location Plan

G19179-IR/02 Exploratory Hole Location Plan Western Site Area

G19179-IR/03 Exploratory Hole Location Plan Eastern Site Area

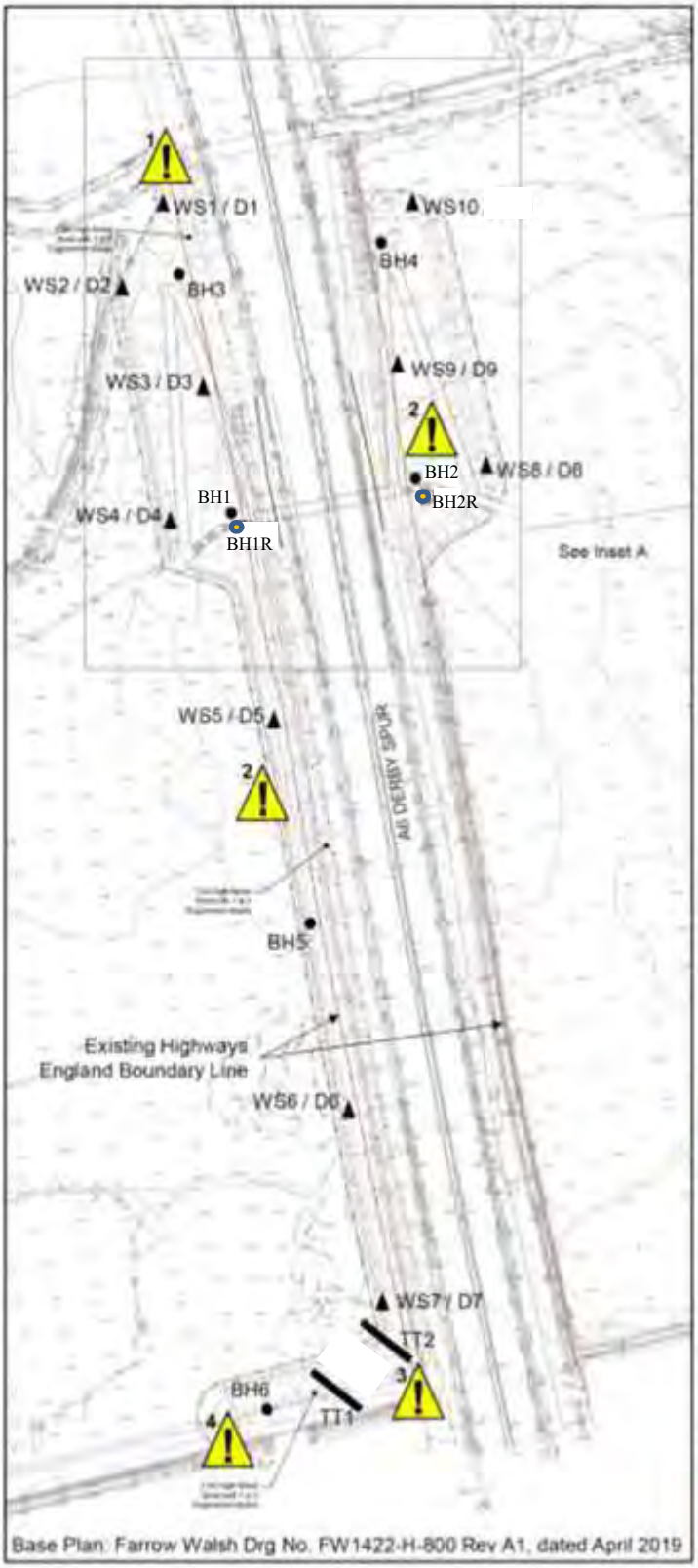


Based upon the Ordnance Survey 1:50000 Scale Landranger 128 Map with the permission of the Controller of Her Majesty's Stationery Office, © Crown copyright Nicholls Colton and Partners Ltd., 7-11 Harding Street, Leicester. Conventional Licence No. AL 100014431.

NICHOLLS COLTON GROUP	Client: Persimmon Homes.

Project:
Proposed Footbridge (Including access embankments) and Noise Bunds at Boulton Moor, Derby.

Drawing No:	Title:	Date:
G19179-IR-01	Site Location Plan	September 2020



Legend

- BH1 Cable percussive hole 1
- BH1R Rotary Borehole
- WS1 / D1 Windowless sample hole 1 with DPSH hole D1 adjacent
- TT1 Trial Trench 1

Ground Investigation Exploratory Hole Plan

Sketch No.: 00314/SK1 Rev B

Date: January 2020

Approximate Scale

0 100m

Residual Risks

1. Proximity of working area to Thulston Brook, which lies in a circa 2.5m deep ditch.
2. No work to be undertaken beyond the site boundary, including the A6 land.
3. Possibility of unrecorded gypsum workings or cavities at or very close to surface.
4. Fly tipping observed in area; possible contamination hazard(s).

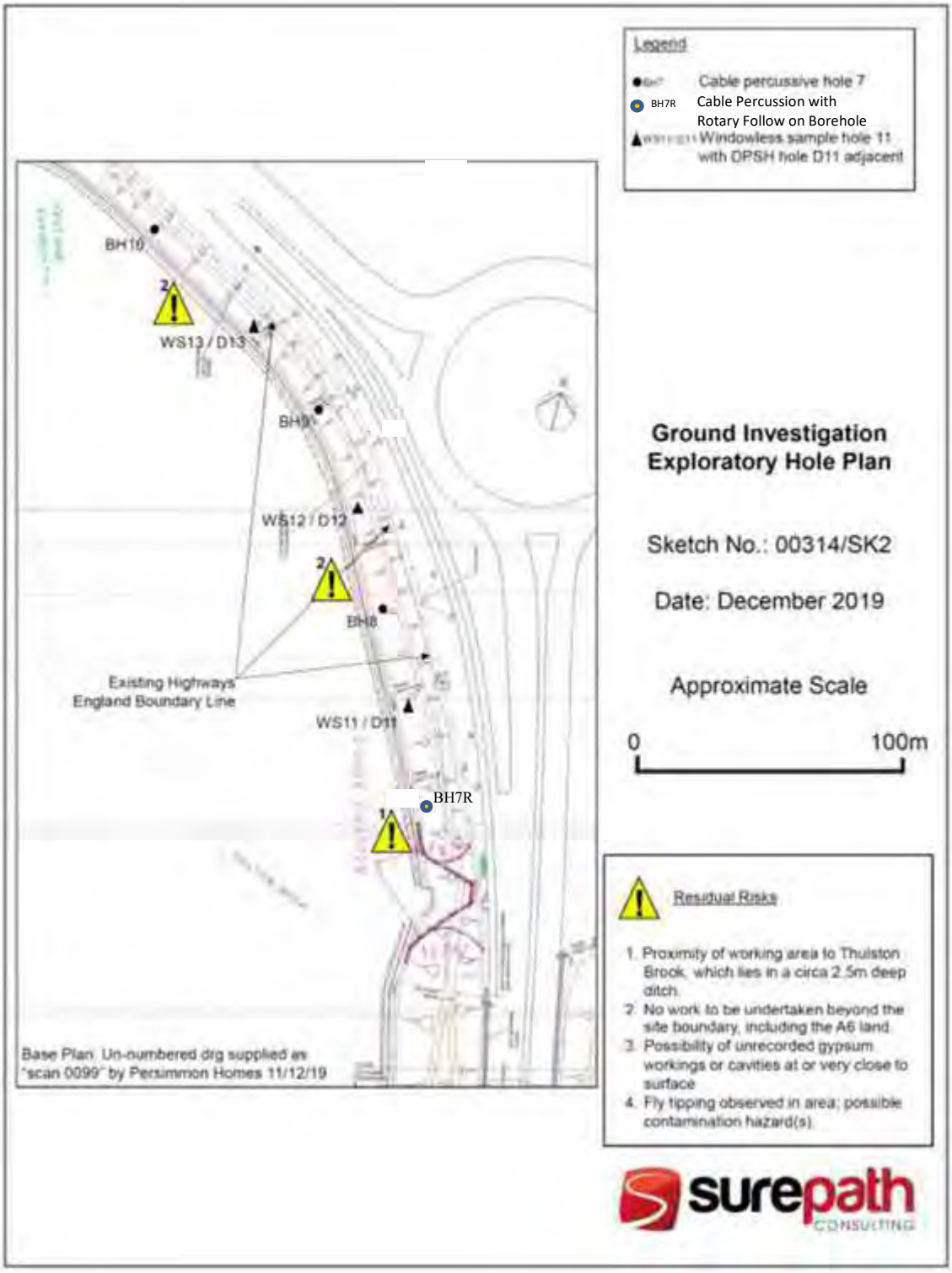
surepath CONSULTING

NICHOLLS COLTON GROUP

Client:
Persimmon Homes.

Project:
Boulton Moor, Derby.

Drawing No:	Title:	Date:
G19179-IR/02	Exploratory Hole Location Plan – Western Site Area.	September 2020



NICHOLLS COLTON GROUP	Client: Persimmon Homes.
Project: Boulton Moor, Derby.	

Drawing No: G19179-IR/03	Title: Exploratory Hole Location Plan – Eastern Site Area.	Date: September 2020

Inertia Consulting Limited

12 Stafford Street
Derby, DE1 1JG

01332 653 003
info@inertiaconsulting.co.uk
www.inertiaconsulting.co.uk