

APPENDIX B

Soakaway Test Report

Bloom Bridge LLP

c/o
Hill Street Holdings

F.A.O. Lauren Bates

Our Ref: 15860/SA

16th November 2016

Dear Lauren

**RE: Results of Soakaway Testing and Geotechnical Ground Investigation at Phase 1A & 1B
Bicester Gate.**

We are writing in regards to the ground investigation and soakaway testing undertaken at the above site

Brief

Soils Limited were commissioned following the acceptance of fee proposal Q18062 Rev3, dated 15th November 2015, to undertake a ground investigation on the site to collect information on the underlying ground conditions in the form of trial holes and the collection of geotechnical samples.

Soakaway testing was also undertaken to determine the level of natural drainage present under the site on the site. These works were undertaken to aid in the future development of the site.

Standards

The site works, soil descriptions and geotechnical testing was undertaken in accordance with the following standards:

- BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design
- BS EN ISO 14688-1:2002+A1:2013 - Geotechnical investigation and testing - Identification and description
- BS EN ISO 14688-2:2004+A1:2013 - Geotechnical investigation and testing - Principles for a classification

The geotechnical laboratory testing was performed by GEO Site & Testing Services Ltd (GSTL) in accordance with the methods given in BS 1377:1990 Parts 1 to 8 and their UKAS accredited test methods.

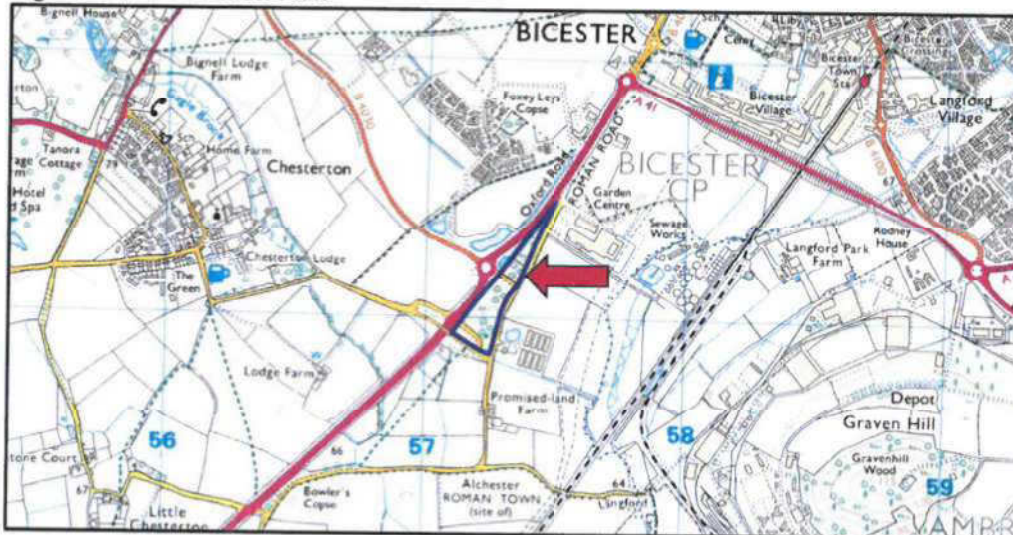
For the preparation of this report, the relevant BS code of practice was adopted for the geotechnical laboratory testing technical specifications, in the absence of the relevant Eurocode specifications (ref: ISO TS 17892).

General

The site was located on the A41 at OS Land Ranger Grid Reference of SP 573 211. At the time of reporting the site was open fields that sloped down towards to the east.

A site location plan is presented in Figure 1.

Figure 1: Site Location Plan



Proposed Development

It is understood that the site is to be developed into a 150 bed hotel and office buildings.

Ground Conditions

On the 27th October 2016 a total of 10 trial holes TP101 – TP107 (including soakaway test locations TP102A, TP103A and TP106A) were excavated on the site by a back acting excavator to depths ranging between 0.60m and 2.90m bgl. The maximum depths of trial holes have been included in Table 1.

All trial holes were scanned with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation to ensure the health and safety of the operatives.

Table 1 Final Depth of Trial Holes

Trial Hole	Depth (m bgl)	Trial Hole	Depth (m bgl)
TP101	2.10	TP104	2.50
TP102	0.80	TP105	2.70
TP102A	0.60	TP106	2.70
TP103	2.90	TP106A	1.50
TP103A	1.20	TP107	2.50

Note: Trial holes with 'A' signifies that they are soakaways

The approximate trial hole locations are shown on Figure 2.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the trial hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots, or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference should be made to the detailed records given within Appendix A, but for the purposes of discussion, the succession of conditions encountered in the trial holes in descending order can be summarised:

Topsoil
River Terrace Deposits
Kellaways Clay Member
Kellaways Sand Member

The ground conditions encountered are summarised in Table 2 below.

Table 2 – Summary of Ground Conditions Encountered

Strata	Depth Encountered (m bgl)		Typical Description
	Top	Base	
Topsoil	0.00	0.25 – 0.65	Dark brown slightly gravelly sandy SILT
River Terrace Deposits	0.25 – 0.65	0.80 – 2.10	Light yellow orange very sandy slightly GRAVEL Light yellow orange very sandy gravelly CLAY
Kellaways Clay Member	1.10 – 2.90	2.00 – 2.90 ¹	Dark grey blue black silty CLAY
Kellaways Sand Member	2.00 – 2.80	2.30 – 2.90 ¹	Dark blue grey SILTSTONE

Notes: ¹ encountered to base of trial hole

With the exception of soakaway trial pit TP102A, which encountered a ceramic field drain pipe at 0.60m bgl, no Made Ground was encountered.

Groundwater

Groundwater was encountered within all the trial holes at depths between 0.80m bgl to 2.90m bgl. When encountered, groundwater in TP103, TP104, TP105 and TP107 was observed to quickly fill the trial pits and rise to between 2.40m and 1.10m bgl. The details of the groundwater strikes are presented in Table 3 below.

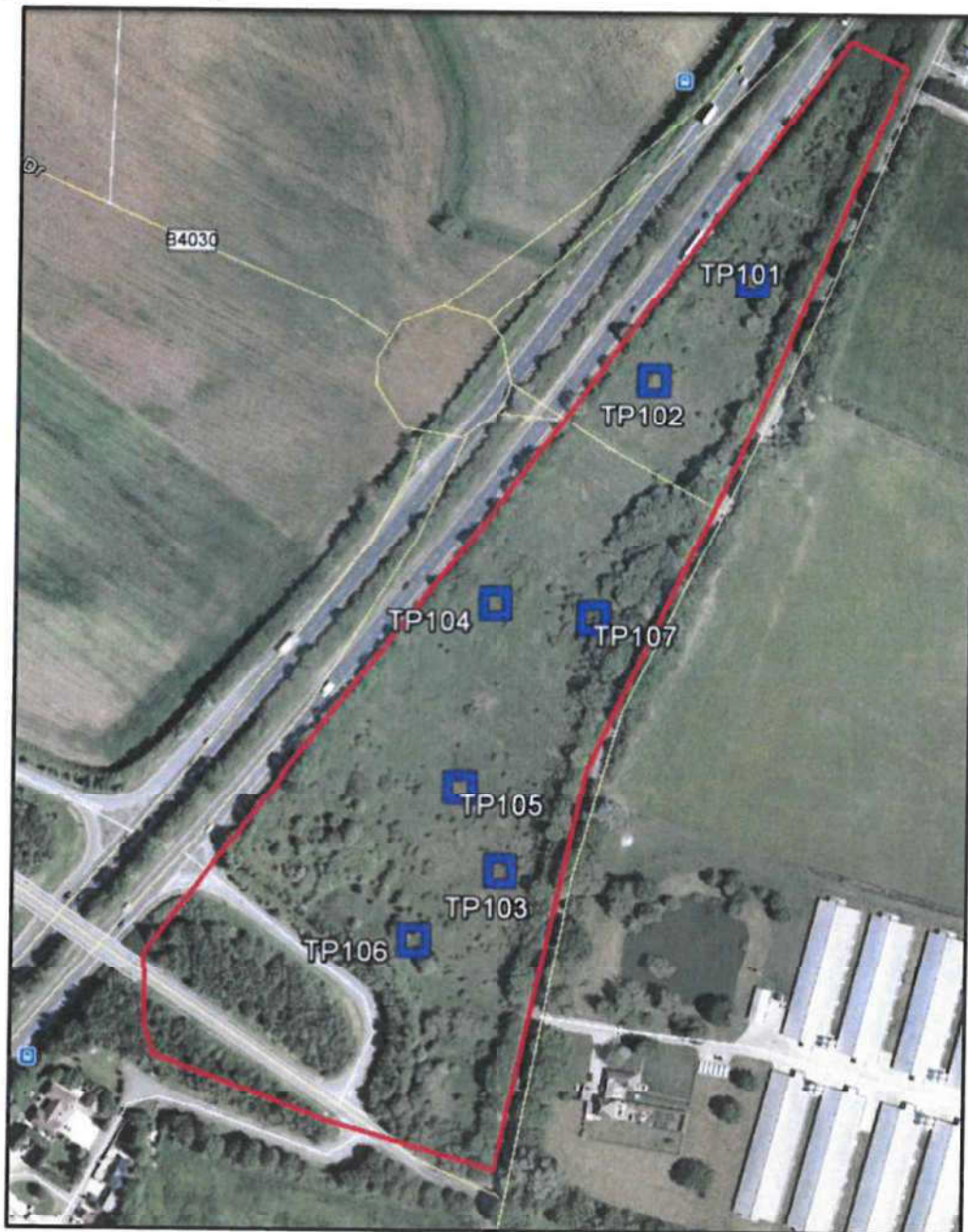
Table 3 – Groundwater Levels

Trial Hole	Groundwater Strike	
	Depth (m bgl)	Groundwater standing level after recorded time (m bgl)
TP101	2.10	Standing water at 2.10m
TP102	0.80	Standing water at 0.80
TP103	2.90	1.10m (after 2 hours)
TP104	2.30	2.20m (after 10 minutes)
TP105	2.70	2.40m (after 10 minutes)

Trial Hole	Groundwater Strike Depth (m bgl)	Groundwater standing level after recorded time (m bgl)
TP106	1.60	Standing water at 1.60m
TP107	2.50	2.40m (after 10 minutes)

The groundwater, with the exception of TP102 originated from the Kellaways Sand Member.

Figure 2: Trial Hole Layout Plan



Geotechnical Testing

A total of 4 samples from the cohesive soils of the Kellaways Clay Formation were submitted to the laboratories of GSTL for 4 Point liquid & Plastic Limit testing. The results of the analysis are presented in Appendix B of this letter and summarised in Table 4 below.

Table 4 – Results of Geotechnical Testing

Stratum	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Soil Classification	Volume Change Potential BRE
Kellaways Clay Formation	28 - 38	25 - 31	92 - 100	23.75 - 31	CI - CH	Medium
Notes: BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results) Soils Classification based on British Soil Classification System <i>The most common use of the term clay is to describe a soil that contains enough clay-sized material or clay minerals to exhibit cohesive properties. The fraction of clay-sized material required varies, but can be as low as 15%. Unless stated otherwise, this is the sense used in Digest 240. The term can be used to denote the clay minerals. These are specific, naturally occurring chemical compounds, predominately silicates. The term is often used as a particle size descriptor. Soil particles that have a nominal diameter of less than 2 µm are normally considered to be of clay size, but they are not necessarily clay minerals. Some clay minerals are larger than 2 µm and some particles, 'rock flour' for example, can be finer than 2 µm but are not clay minerals.</i> (The Atterberg Limit Tests were undertaken in accordance with BS 1377:Part 2:1990 Clauses 3.2, 4.3 and 5)						

Soakaway Testing

Soakaway tests were undertaken within TP102A, TP103A and TP106A. The tests comprised piping water via a water tanker into the open trial hole, the drop in water level over time was then recorded to give an indication of soakage potential.

BRE DG365:2016 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test is completed once 75% of the water present has drained away, in order to determine whether or not the underlying ground conditions may be suitable for surface water drainage.

To avoid encountering groundwater, the depth of these soakaway trial pits were advanced to depths above where groundwater had been observed in neighbouring trial pits - in this case TP102, TP103 and TP106. Due to the infiltration rates observed only one test was undertaken in each trial hole. The test in TP102 was voided as water in the trial pit was escaping into a field drain pipe that had been exposed as the water was emptied into the pit. Table 5 below details the depths of the soakaways and the corresponding strata. The results of the soakaway testing is presented in Appendix C of this letter report.

Table 5 – Summary of Soakaway Test Locations

Trial Hole	Depth of Soakaways (m bgl)	Strata	Infiltration Rate
TP102A	0.60	Gravel field drain	
TP103A	1.20	Sandy GRAVEL (River Terrace Deposits)	1.382 x10⁻⁵ m/sec¹
TP106A	1.50	Sandy GRAVEL (River Terrace Deposits)	4.499 x10⁻⁶ m/sec²
Notes:	¹ One test undertaken ² Results of an extrapolated test		

Of the three soakaway trial holes undertaken, only one soakaway test (TP103A) drained sufficiently to calculate an infiltration rate. TP106 did not finish however it was possible to extrapolate and infiltration rate from the data collected. The test completed in TP103A produced a calculated infiltration rate of **1.382 x10⁻⁵ m/sec** for the unsaturated sandy GRAVELS of the River Terrace Deposits at a depth of 1.20m. Extrapolation of the test in TP106A produced an infiltration rate of **4.499 x10⁻⁶ m/sec**. As the tests were not conducted a further two times it has not been possible to provide an infiltration rate in full compliance accordance with the BRE standard.

Conclusions

The ground investigation encountered Topsoil over superficial River Terrace Deposits. The River Terrace Deposits overlie the Kellaways Clay and Sand Member. Groundwater was encountered at depths of between 0.80m and 2.90m bgl.

Geotechnical sampling undertaken recorded the cohesive soils of the Kellaways Clay Formation to have medium volume change potential.

Three trial pit soakaways TP102A, TP103A and TP106A were undertaken on site. The results of the single soakaway test completed in TP103A and the extrapolated test in TP106A indicated an infiltration rates of between **1.382 x10⁻⁵ m/sec** and **4.499 x10⁻⁶ m/sec** in the shallow sandy GRAVEL of the River Terrace Deposits in the south of the site. Providing that the gravel band encountered in TP103A is laterally continuous across the site and at a suitably shallow depth then it is possible that this stratum will provide suitable infiltration for a SUDS system. It is however, recommended that further testing is undertaken to identify the extent and depth of the gravel band across the site. The infiltration rates provided in this letter report should be used with caution until further testing is undertaken. If no further testing is undertaken, then the more conservative value of **4.499 x10⁻⁶ m/sec** should be adopted.

The following attachments make up the remainder of this letter report.

Appendix A – Trial Hole Logs

Appendix B – Geotechnical Analysis

Appendix C - Soakaway Results

Should you have any further questions please do not hesitate to contact the undersigned.

Yours Sincerely

A handwritten signature in blue ink, appearing to read 'J. Hucklesby', is positioned above the printed name.

J. Hucklesby BEng (Hons)
Geo environmental Engineer
JSH@soilslimited.co.uk

Appendix A – Trial Hole Logs

Trial Pit Log

Trial Pit No.

TP101

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Hole Type

Location: Bicester Gateway

Plant:

TP

Support:

Scale

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

1:25

Dates: 27/10/2016

Level:

Co-ords:

Logged By
CF

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D					Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.60	D		0.45			Light yellow orange very sandy slightly clayey fine to medium flint GRAVEL. Sand is fine to coarse.	
	0.90	D		0.80			Dark blue grey silty CLAY. Frequent shell fragments	1
	1.50	D					Dark blue grey SILTSTONE.	2
	2.00	D		2.00				
	2.10	D		2.10			End of Pit at 2.10m	
								3
								4
								5

General Remarks:

Roots observed to 0.50m bgl. Groundwater encountered at 2.10m bgl and rising.

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR
Tel: 01737 814221 Email: admin@soilslimited.co.uk

Trial Pit Log

Trial Pit No.

TP102

Sheet 1 of 1

Project Name: Phase 1a & 1B		Project No.: 15860		Method:		Hole Type	
Location: Bicester Gateway				Plant:		TP	
Client: Hill Street Holdings Ltd		Trial Pit Length: m		Trial Pit Width: m		Scale	
Dates: 27/10/2016		Level:		Co-ords:		1:25	
						Logged By	
						CF	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D		0.25			Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.50	D					Light yellow orange very sandy slightly clayey fine to medium flint GRAVEL. Sand is fine to coarse.	
				0.80			End of Pit at 0.80m	
								1
								2
								3
								4
								5

General Remarks:

Roots observed to 0.50m bgl. First hole had ground water at 0.80 so back filled and dug a shallower pit next to it.

Groundwater Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR
Tel: 01737 814221 Email: admin@soilslimited.co.uk

Trial Pit Log

Trial Pit No.

TP102A

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Location: Bicester Gateway

Plant:

Support:

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

Dates: 27/10/2016

Level:

Co-ords:

Hole Type
TP

Scale

1:25

Logged By

Water
Strike

Samples & In Situ Testing

Depth

Type

Results

Depth
(m)Level
(m)

Legend

Stratum Description

Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets

Light yellow orange very sandy slightly clayey fine to medium flint GRAVEL. Sand is fine to coarse.

End of Pit at 0.60m

General Remarks:

Roots observed to 0.50m bgl. Field drain encountered during soakaway testing

Groundwater Remarks:

Sample Type

D: Disturbed

B: Bulk

J: Jar

W: Water

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR
Tel: 01737 814221 Email: admin@soilslimited.co.uk

Trial Pit Log

Trial Pit No.

TP103

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Plant:

Support:

Hole Type

TP

Scale

1:25

Logged By

CF

Dates: 27/10/2016

Level:

Co-ords:

Water
Strike

Samples & In Situ Testing

Depth

Level

(m)

(m)

Legend

Stratum Description

Depth

Type

Results

Depth

Level

(m)

(m)

Legend

Stratum Description

0.30

D

0.40

0.40

0.40

0.40

0.40

Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets

0.60

D

0.60

0.60

0.60

0.60

0.60

Light yellow orange very sandy slightly clayey fine to medium flint GRAVEL. Sand is fine to coarse.

0.90

D

0.90

0.90

0.90

0.90

0.90

Dark blue grey silty CLAY. Frequent shell fragments

1.50

D

1.50

1.50

1.50

1.50

1.50

2.00

D

2.00

2.00

2.00

2.00

2.00

2.50

D

2.50

2.50

2.50

2.50

2.50

2.90

D

2.90

2.90

2.90

2.90

2.90

Dark blue grey SILTSTONE.

End of Pit at 2.90m

General Remarks:

Roots observed to 0.50m bgl. Groundwater encountered at 2.9m bgl, standing at 1.10m bgl after 2 hours.

Groundwater Remarks:

Sample Type

D: Disturbed

B: Bulk

J: Jar

W: Water

Trial Pit Log

Trial Pit No.

TP104

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Hole Type

Location: Bicester Gateway

Plant:

TP

Support:

Scale

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

1:25

Dates: 27/10/2016

Level:

Co-ords:

Logged By
CF

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	D		0.40			Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.60	D					Light yellow orange very sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium made up of flint. Frequent rootlets, becoming less gravelly and less sandy with depth	
	0.90	D		1.20			Dark blue grey silty CLAY. Frequent shell fragments	1
	1.50	D					Dark blue grey SILTSTONE.	2
	2.00	D		2.20			Dark blue grey SILTSTONE.	
	2.50	D		2.50			End of Pit at 2.50m	3
								4
								5

General Remarks:

Roots observed to 1.20m bgl. Groundwater encountered at 2.30m bgl, standing at 2.20m bgl after 10 minutes.

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Hole Type

Location: Bicester Gateway

Plant:

TP

Support:

Scale

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

1:25

Dates: 27/10/2016

Level:

Co-ords:

Logged By

CF

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	D		0.40			Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.60	D					Light yellow orange very sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium made up of flint. Frequent rootlets... becoming less gravelly and less sandy with depth	
	0.90	D						
	1.50	D						
	2.00	D		2.10			Dark blue grey silty CLAY Frequent shell fragments	
	2.50	D		2.60 2.70			Dark blue grey SILTSTONE.	
							End of Pit at 2.70m	

General Remarks:

Roots observed to 2.10m bgl. Groundwater encountered at 2.70m bgl, standing at 2.40m bgl after 10 minutes.

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:

Project Name: Phase 1a & 1B		Project No.: 15860	Method:	Hole Type TP
Location: Bicester Gateway			Plant:	
Client: Hill Street Holdings Ltd		Trial Pit Length: m	Trial Pit Width: m	Scale 1:25
Dates: 27/10/2016	Level:	Co-ords:		Logged By CF

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D					Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.60	D		0.65				
	0.90	D					Light yellow orange very sandy slightly clayey fine to medium flint GRAVEL. Sand is fine to coarse.	
	1.50	D		1.60				
	2.00	D					Dark blue grey CLAYEY SILT. Frequent shell fragments	
	2.50	D		2.70				
							End of Pit at 2.70m	

General Remarks:

Roots observed to 0.50m bgl. Groundwater encountered at 1.60m bgl.

Groundwater Remarks:

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

**Soils Limited**

Newton House, Cross Road, Tadworth KT20 5SR
Tel: 01737 814221 Email: admin@soilslimited.co.uk

Trial Pit Log

Trial Pit No.

TP106A

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Location: Bicester Gateway

Plant:

Support:

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

Dates: 27/10/2016

Level:

Co-ords:

Hole Type
TP

Scale

1:25

Logged By

Water
Strike

Samples & In Situ Testing

Depth

Type

Results

Depth
(m)Level
(m)

Legend

Stratum Description

Dark brown slightly gravelly sandy SILT. Sand is fine to coarse,
gravel is fine to medium, made up of flint. Frequent rootlets

Light yellow orange very sandy slightly clayey fine to medium flint
GRAVEL. Sand is fine to coarse.

End of Pit at 1.60m

General Remarks:

Roots observed to 0.50m bgl. Groundwater encountered at 1.60m bgl.

Sample Type

D: Disturbed

B: Bulk

J: Jar

W: Water

Groundwater Remarks:

Trial Pit Log

Trial Pit No.

TP107

Sheet 1 of 1

Project Name: Phase 1a & 1B

Project No.: 15860

Method:

Hole Type

Location: Bicester Gateway

Plant:

TP

Support:

Scale

Client: Hill Street Holdings Ltd

Trial Pit Length: m

Trial Pit Width: m

1:25

Dates: 27/10/2016

Level:

Co-ords:

Logged By
CF

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	D		0.40			Dark brown slightly gravelly sandy SILT. Sand is fine to coarse, gravel is fine to medium, made up of flint. Frequent rootlets	
	0.60	D					Light yellow orange very sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium made up of flint. Frequent rootlets becoming less gravelly and less sandy with depth	
	0.90	D		1.00			Dark blue grey silty CLAY. Frequent shell fragments	1
	1.50	D						
	2.00	D						2
	2.50	D		2.40 2.50			Dark blue grey silty CLAY.	
							End of Pit at 2.50m	
								3
								4
								5

General Remarks:

Roots observed to 1.00m bgl. Groundwater encountered at 2.50m bgl, standing at 2.40m bgl after 10 minutes.

Sample Type

D: Disturbed
B: Bulk
J: Jar
W: Water

Groundwater Remarks:

Appendix B – Geotechnical Analysis



Laboratory Report



GEO Site & Testing Services Ltd

Contract Number: 32973

Client's Reference: **15860**

Report Date: **08-11-2016**

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

Contract Title: **1a and 1b Gateway Bicester**
For the attention of: **James Hucklesby**

Date Received: **02-11-2016**
Date Commenced: **02-11-2016**
Date Completed: **08-11-2016**

Test Description

4 Point Liquid & Plastic Limit (LL/PL)

1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS

Qty

4

Moisture Content

1377 : 1990 Part 2 : 3.2 - * UKAS

4

Disposal of Samples on Project

1

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

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

Client ref:	15860
Location:	1a & 1b Gateway Bicester
Contract Number:	32973

[illegible]

Note: Results on this table are in summary format and may not meet the requirements of the relevant standards, additional information is held by the laboratory



For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 8.11.16

End

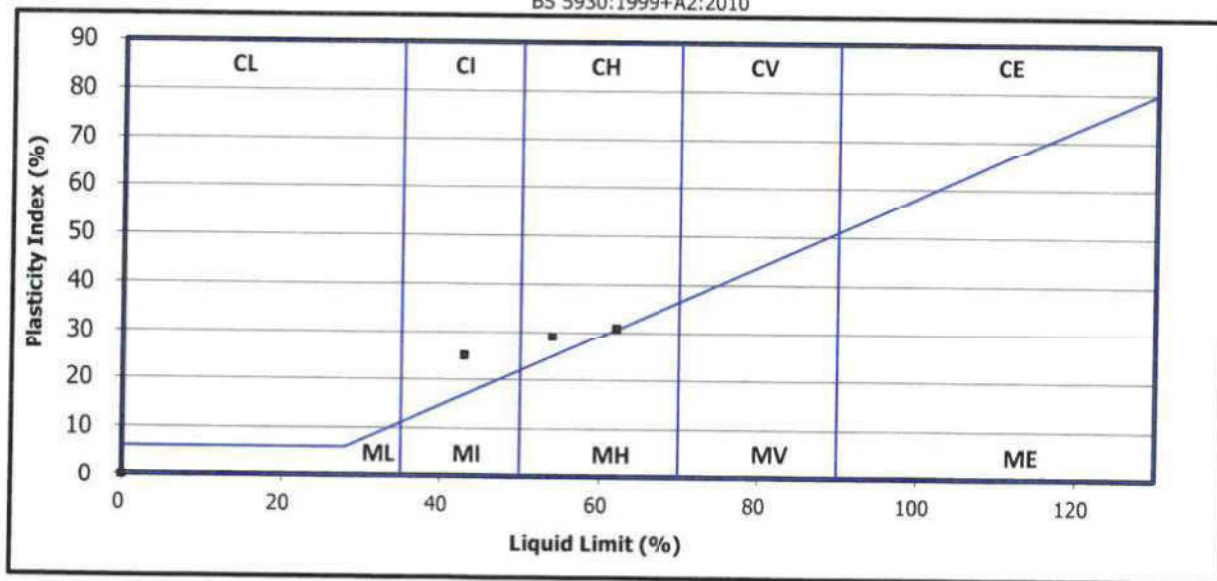


**Test Report: Method of the Determination of the plastic limit and plasticity index
BS 1377 : Part 2 : 1990 Method 5**

Client ref: 15860
Location: 1a & 1b Gateway Bicester
Contract Number: 32973

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
TP101	S/B	2.00	38	62	31	31	100	CH High Plasticity
TP103	S/B	1.50	8.2		NP		50	
TP105	S/B	2.50	25	43	18	25	95	CI Intermediate Plasticity
TP107	S/B	2.50	28	54	25	29	92	CH High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved
PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.
BS 5930:1999+A2:2010



GSTL
GEO SITE & TESTING SERVICES LTD

For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)
Date: 8.11.16

Emma Sharp



Appendix C - Soakaway Results

Soakaway Calculations

Soakaway Test No.	TP103
Contract:	Phase 1a & 1b Bicester Gateway
Contract No.	15860

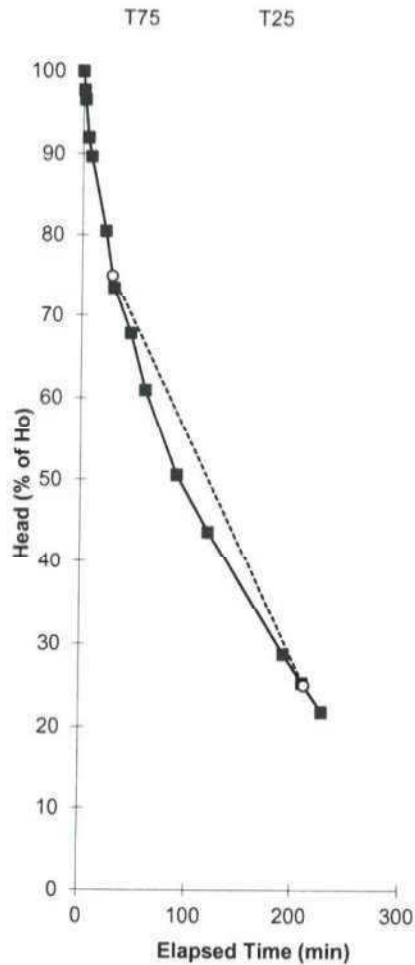
Field Test

Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.20 m
Width of Pit	0.60 m
Length of Pit	2.10 m
Depth of Pit Soaked	0.87 m
ap50	3.609 m ²
V _{p75-25}	0.5481 m ³
t ₇₅₋₂₅	183.2 min
water used	1.0962 m ³
f	1.382E-05 m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.33	0	100	0.87
0.35	1.0	98	0.85
0.36	2.0	97	0.84
0.40	5.0	92	0.80
0.42	8.0	90	0.78
0.50	22.0	80	0.70
0.56	30.0	74	0.64
0.61	46.0	68	0.59
0.67	60.0	61	0.53
0.76	90.0	51	0.44
0.82	120.0	44	0.38
0.95	192.0	29	0.25
0.98	210.0	25	0.22
1.01	228.0	22	0.19



T75	28.333	75
T25	211.500	25
T75-25	183.167	Derived from Best Fit

Comments

SOILS LIMITED

Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

Telephone: 01737 814 221
Facsimile: 01737 812 557

Soakaway Calculations

Soakaway Test No.	TP106
Contract:	Phase 1a & 1b Bicester Gateway
Contract No.	15860

Field Test

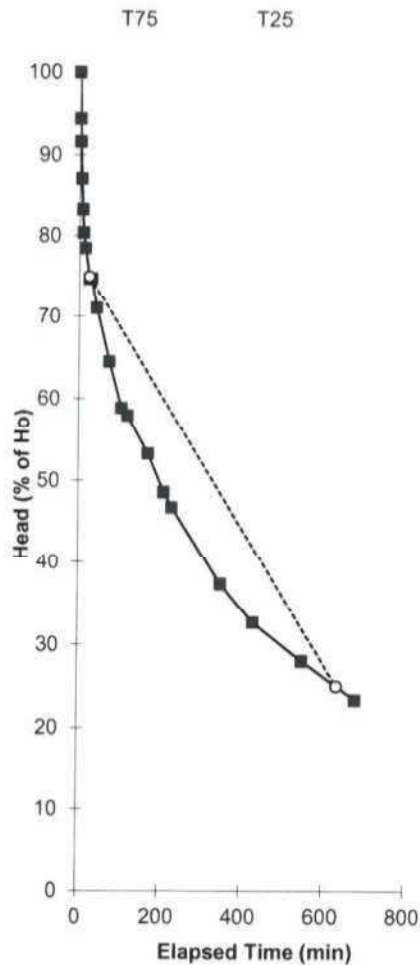
Trial Pit Log (include details of groundwater):
See trial Pit record

Depth of Pit	1.50 m
Width of Pit	0.60 m
Length of Pit	2.30 m
Depth of Pit Soaked	1.07 m
ap50	4.483 m ²
V _{p75-25}	0.7383 m ³
t ₇₅₋₂₅	610.1 min
water used	1.4766 m ³
f	4.499E-06 m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
0.43	0	100	1.07
0.49	1.0	94	1.01
0.52	2.0	92	0.98
0.57	5.0	87	0.93
0.61	8.0	83	0.89
0.64	10.0	80	0.86
0.66	15.0	79	0.84
0.70	25.0	75	0.80
0.7	30.0	75	0.80
0.74	43.0	71	0.76
0.81	75.0	64	0.69
0.87	105.0	59	0.63
0.88	120.0	58	0.62
0.93	171.0	53	0.57
0.98	210.0	49	0.52
1.00	230.0	47	0.50
1.10	350.0	37	0.40
1.15	430.0	33	0.35
1.20	550.0	28	0.30
1.25	680.0	23	0.25

T75	24.375	75
T25	634.500	25
T75-25	610.125	Derived from Best Fit



Comments

Extrapolated from 230 mins in order to calculate an indicative infiltration rate

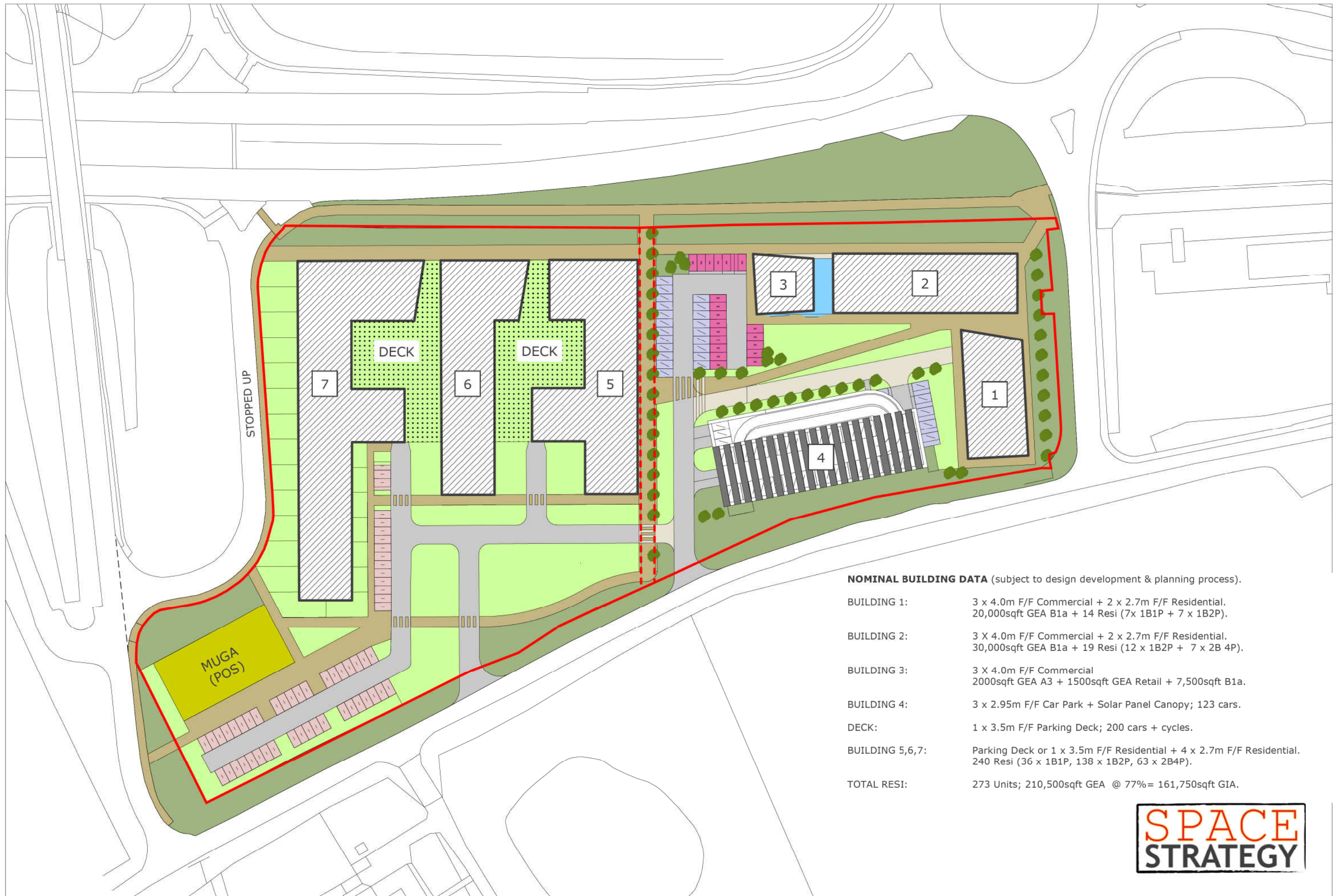
SOILS LIMITED

Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

Telephone: 01737 814 221
Facsimile: 01737 812 557

APPENDIX C

Indicative Layout Drawing



NOMINAL BUILDING DATA (subject to design development & planning process).

BUILDING 1:	3 x 4.0m F/F Commercial + 2 x 2.7m F/F Residential. 20,000sqft GEA B1a + 14 Resi (7x 1B1P + 7 x 1B2P).
BUILDING 2:	3 X 4.0m F/F Commercial + 2 x 2.7m F/F Residential. 30,000sqft GEA B1a + 19 Resi (12 x 1B2P + 7 x 2B 4P).
BUILDING 3:	3 X 4.0m F/F Commercial 2000sqft GEA A3 + 1500sqft GEA Retail + 7,500sqft B1a.
BUILDING 4:	3 x 2.95m F/F Car Park + Solar Panel Canopy; 123 cars.
DECK:	1 x 3.5m F/F Parking Deck; 200 cars + cycles.
BUILDING 5,6,7:	Parking Deck or 1 x 3.5m F/F Residential + 4 x 2.7m F/F Residential. 240 Resi (36 x 1B1P, 138 x 1B2P, 63 x 2B4P).
TOTAL RESI:	273 Units; 210,500sqft GEA @ 77%= 161,750sqft GIA.