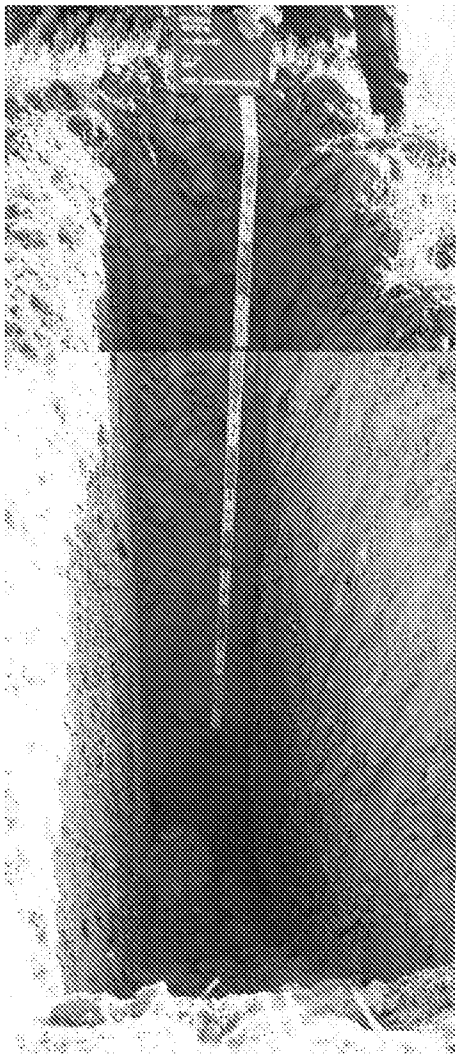
Trial Pit Photographs

TP10





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

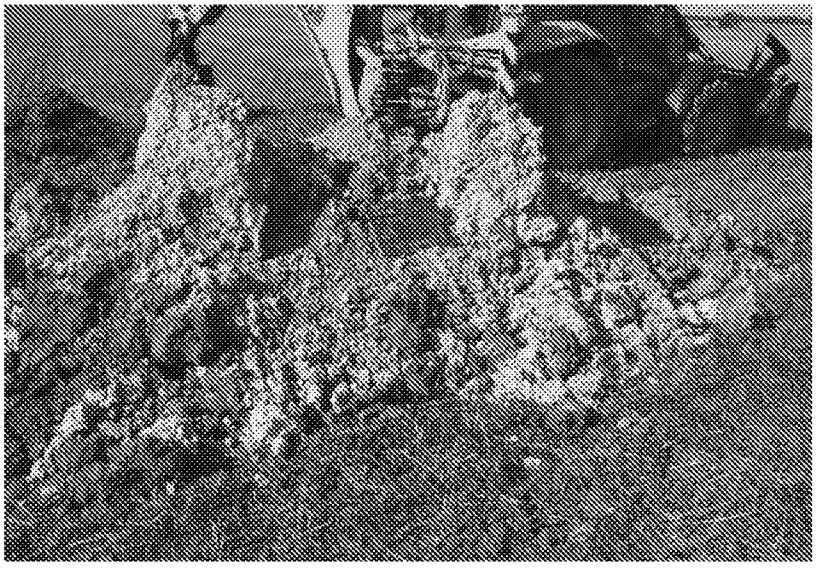
BRD

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP11





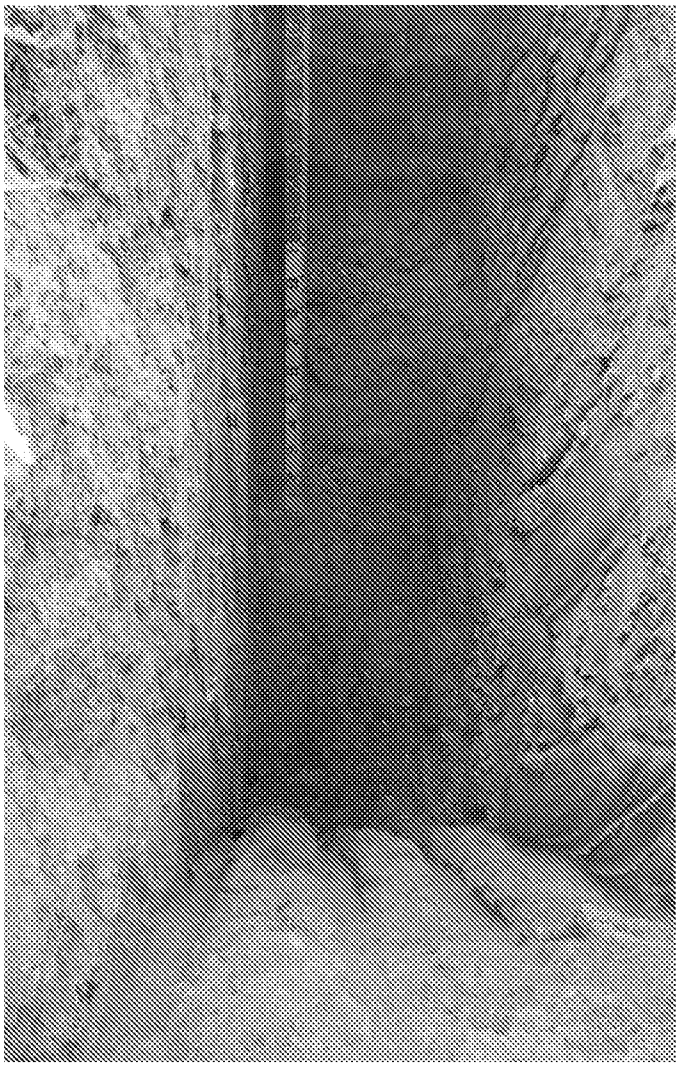
Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

BRD

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP12





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

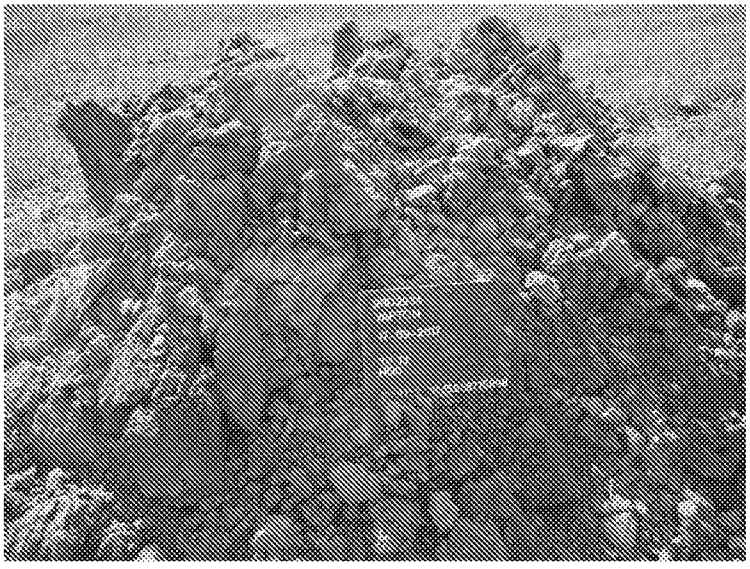
BRD

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP13





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

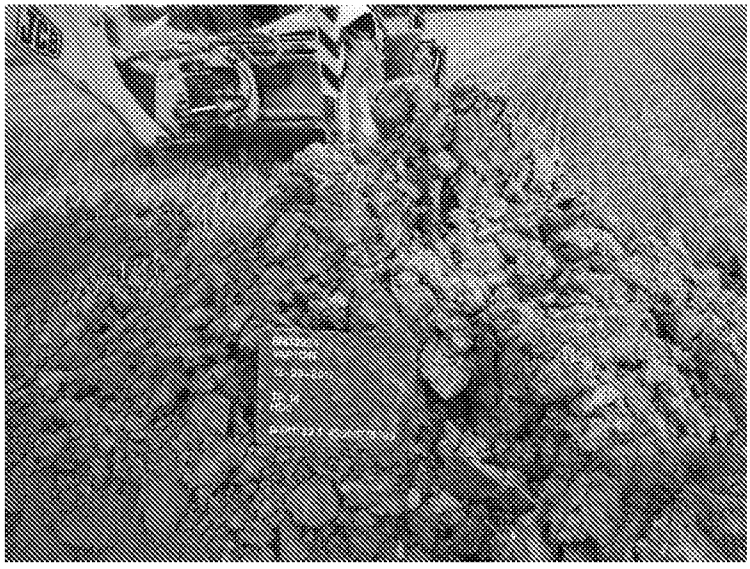
[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP14





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP15





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

BRD

[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP16





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

BRD

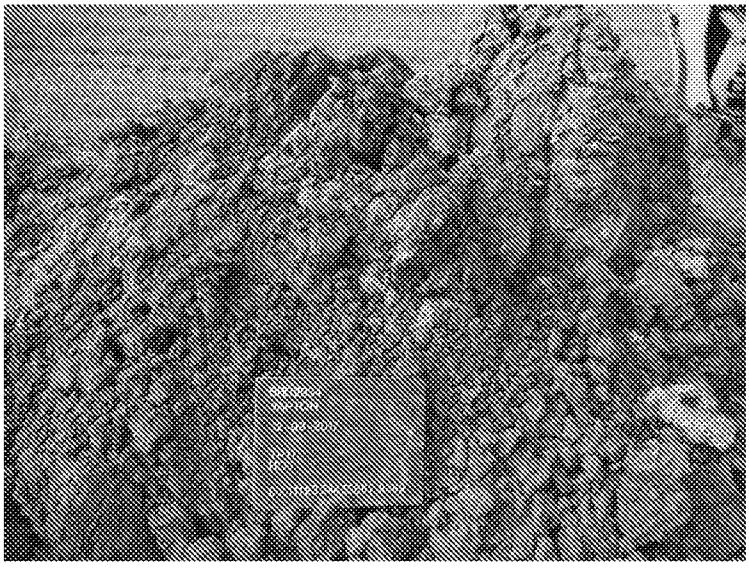
[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP17





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

BRD

[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

Trial Pit Photographs

TP18





Project Title:	Land at Drove Lane, Yapton
Client:	Trustees of the Langmead Pension Scheme
BRD Reference:	BRD2934-OP5-A
Date Issued:	October 2017

BRD

[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS01

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			TOPSOIL/MADE GROUND: Friable, brown, slightly humic silty clay.			MG	
				Stiff, orange brown, sandy gravelly silty CLAY. Gravel is fine and medium sized flint.	0.27 (5.23)		RIVER TERRACE DEPOSITS	
0.60	J2							
1.00	PEN 3.00/3.00/3.00 SPT kg/cm² D1	11 N		1.00 - 1.45 m: SPT: 4 for 150mm/2,3,3,3	1.0			
				Stiff, off-white, pale brown and orange brown sandy gravelly silty CLAY. Gravel is fine, subrounded chalk with flint.	1.45 (4.05)			
2.00	PEN 3.50/3.50/3.50 SPT kg/cm² D2	8 N		2.00 - 2.45 m: SPT: 4 for 150mm/2,2,2,2	2.0			
				White, off-white CHALK recovered as gravelly (20%) SILT. Gravel is fine, subangular with occasional chalk (CIRIA Chalk Grade Dm).	2.45 (3.05)		LNCF	
3.00	SPT D3	4 N		3.00 - 3.45 m: SPT: 1 for 150mm/1,1,1,1	3.0			
				3.60 m: Wet soils.				
4.00	SPT	4 N		4.00 - 4.45 m: SPT: 6 for 150mm/1,1,1,1 4.00 - 5.45 m: Installation backfilled with chalk.	4.0			
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seeepage at 3.60m bgl.
Ground levels estimated from Digital Terrain Survey LLP drawing DTS240417-7QOB Rev2, April 2014, "Site Survey".

Surface Elevation Level:
5.50

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS01

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
				Continued from 2.45m bgl: White, off-white CHALK recovered as gravelly (20%) SILT. Gravel is fine, subangular with occasional chalk (CIRIA Chalk Grade Dm).	5.0			
5.00	SPT	18 N		CHALK of silty GRAVEL recovered as off-white, white gravelly silt (CIRIA Chalk Grade Dc). 5.00 - 5.45 m: SPT: 6 for 150mm/3,4,4,7	5.00 (0.50)		LNCF	
					5.45 (0.05)			
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seeepage at 3.60m bgl.
Ground levels estimated from Digital Terrain Survey LLP drawing DTS240417-7QOB Rev2, April 2014, "Site Survey".

Surface Elevation Level:
5.50

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS02

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			MADE GROUND: Friable brown, slightly humic, slightly gravelly silty TOPSOIL. Gravel is fine to medium sized weathered low/unburnt coal ash.				
					0.50 (5.25)			
0.60	PEN 3.50/3.00/3.50 J2	kg/cm²		MADE GROUND: Firm, brown, slightly gravelly, slightly sandy silty clay. Gravel is coal with fine subangular flint and coarse subrounded flint.			MG	
					1.0			
1.00	PEN 2.00/2.00/2.00 SPT	kg/cm² 8 N		1.00 - 1.45 m: SPT: 2 for 150mm/1,2,2,3				
					1.10 (4.65)			
1.20	D1			Stiff, locally firm, pale brown mottled orange brown, slightly gravelly, slightly sandy silty CLAY.			RIVER TERRACE DEPOSIT	
1.80	PEN 2.00/2.00/2.00	kg/cm²						
2.00	SPT	8 N		2.00 - 2.45 m: SPT: 4 for 150mm/2,2,2,2	2.0			
					2.25 (3.50)			
2.50	PEN 3.00/3.00/2.50	kg/cm²		Off-white stained dark black and dark brown CHALK containing gravelly (20%) SILT. Gravel is medium sized flint with occasional chalk. Clay is dark brown, frequent. (CIRIA Chalk Grade Dm).			LEWES NODULAR CHALK FORMATION	
2.80	D2							
3.00	PEN 3.50/3.00/3.50 SPT	kg/cm² 5 N		3.00 - 3.45 m: SPT: 1 for 150mm/1,1,1,2	3.0			
				3.80 m: Wet soils.				
4.00	PEN 3.50/3.50/3.50 SPT	kg/cm² 4 N		4.00 - 4.45 m: SPT: 6 for 150mm/1,1,1,1 4.00 - 5.45 m: Installation backfilled with chalk.	4.0			
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 3.80m bgl.

Surface Elevation Level:
5.75

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS02

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
				Continued from 2.25m bgl: Off-white stained dark black and dark brown CHALK containing gravelly (20%) SILT. Gravel is medium sized flint with occasional chalk. Clay is dark brown, frequent. (CIRIA Chalk Grade Dm).	5.0 5.00 (0.75)		LNCF	
5.00	SPT	18 N		CHALK of silty GRAVEL recovered as off-white, white, gravelly silt (CIRIA Chalk Grade Dc). 5.00 - 5.45 m: SPT: 6 for 150mm/3,4,4,7	5.45 (0.30)			
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 3.80m bgl.

Surface Elevation Level:
5.75

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS03

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			Friable, brown, slightly humic silty TOPSOIL.			TS	
					0.30 (6.07)			
				Stiff, orange brown silty CLAY.			RIVER TERRACE DEPOSITS	
0.50	J2							
1.00	PEN 2.50/2.50/2.50 kg/cm² SPT D1	8 N		1.00 - 1.45 m: SPT: 3 for 150mm/2,1,2,3	1.0			
2.00	PEN 2.75/2.75/2.75 kg/cm² SPT D2	8 N		Off-white, locally stained light brown CHALK comprising of slightly gravelly (10%) SILT. Gravel is fine flint. (CIRIA Chalk Grade Dm). 2.00 - 2.45 m: SPT: 2 for 150mm/1,2,2,3	2.0 1.98 (4.39)		LEWES CHALK FORMATION	
3.00	SPT	8 N		Off-white CHALK comprising of silty GRAVEL (45%) of medium sized subangular flint and frequent. Very weak chalk (CIRIA Chalk Grade Dc). 3.00 - 3.45 m: SPT: 3 for 150mm/2,2,2,2	3.0 3.00 (3.37)			
4.00	SPT	13 N		4.00 m: Wet soils. 4.00 - 4.45 m: SPT: 11 for 150mm/4,3,2,4	4.0			
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 4.00m bgl.

Surface Elevation Level:
6.37

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

ARUN DISTRICT COUNCIL Y/153/21/DOC

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS03

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
				Continued from 3.00m bgl: Off-white CHALK comprising of silty GRAVEL (45%) of medium sized subangular flint and frequent. Very weak chalk (CIRIA Chalk Grade Dc).				
4.80	PEN 3.00/3.00/3.00 D3	kg/cm²						
5.00	SPT	17 N		5.00 - 5.45 m: SPT: 6 for 150mm/4,5,4,4	5.0			
					5.45 (0.92)		LCNF	
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 4.00m bgl.

Surface Elevation Level:
6.37

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS04

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.20	J1			Friable, brown, slightly humic silty TOPSOIL.	0.30 (6.37)		TS	
0.60	J2			Stiff, friable, orange brown mottled silty CLAY.			RIVER TERRACE DEPOSITS	
0.80	PEN	4.50/4.50/4.50 kg/cm²						
1.00	SPT D1	9 N		1.00 - 1.45 m: SPT: 2 for 150mm/2,2,2,3	1.0			
1.50	PEN	2.25/2.25/2.25 kg/cm²			1.90 (4.77)			
2.00	SPT D2	8 N		Stiff, friable, orange brown, slightly gravelly, slightly sandy silty CLAY. Gravel is fine subangular flint with chalk. 2.00 - 2.45 m: SPT: 3 for 150mm/2,2,2,2	2.0			
2.30	PEN	2.00/2.00/2.00 kg/cm²			2.50 (4.17)			
2.60	PEN	1.50/1.50/1.50 kg/cm²		Loose, light brown and grey brown, slightly gravelly sandy SILT.				
2.80	PEN	0.50/0.50/0.50 kg/cm²						
3.00	SPT D3	9 N		3.00 - 3.45 m: SPT: 1 for 150mm/1,2,3,3	3.0			
3.30	PEN	0.75/0.50/0.50 kg/cm²						
3.80	PEN	2.50/2.50/2.50 kg/cm²		Stiff, friable, orange brown, slightly sandy, slightly gravelly silty CLAY. Gravel is fine, subangular chalk (20%) with occasional medium sized subrounded flint (<5%).	3.75 (2.92)			
4.00	SPT	6 N		Off-white, locally brown CHALK comprising of slightly clayey, gravelly (20%) SILT. Gravel is fine to medium sized subrounded chalk with occasional flint (CIRIA Chalk Grade Dm). 4.00 - 4.45 m: SPT: 5 for 150mm/2,1,1,2	4.0 4.00 (2.67)		LCNF	
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.67

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 13/09/2017
Date Completed: 13/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS04

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
5.00	SPT	9 N		Continued from 4.00m bgl: Off-white, locally brown CHALK comprising of slightly clayey, gravelly (20%) SILT. Gravel is fine to medium sized subrounded chalk with occasional flint (CIRIA Chalk Grade Dm). 5.00 - 5.45 m: SPT: 1 for 150mm/2,3,2,2	5.0 5.45 (1.22)		LCNF	
					6.0 7.0 8.0 9.0			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.67

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS05

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			MADE GROUND: Friable, brown, slightly humic silty TOPSOIL.	0.15 (6.34)		MG	
0.30	J2			MADE GROUND: Stiff, friable, orange brown silty CLAY with occasional fine, angular gravel of brick to 0.50m.				
0.50	PEN J3	>4.50/>4.50/>4.50 kg/cm²		Stiff, friable, orange brown silty CLAY.	0.55 (5.94)			
1.00	PEN SPT D1	4.00/4.00/4.00 kg/cm² 15 N		1.00 - 1.45 m: SPT: 4 for 150mm/3,4,4,4	1.0		RIVER TERRACE DEPOSITS	
1.50	PEN D2	>4.50/>4.50/>4.50 kg/cm²		1.60 m: Cobble of flint (170 x >90 x >90 mm)				
2.00	SPT	13 N		2.00 - 2.45 m: SPT: 11 for 150mm/5,3,3,2	2.0			
2.80	PEN	1.00/1.00/1.50 kg/cm²		Firm, orange brown, slightly sandy, slightly gravelly silty CLAY. Gravel is fine and medium sized angular flint.	2.70 (3.79)			
3.00	SPT D3	3 N		Soft, light brown clayey SILT. 3.00 - 3.45 m: SPT: 1 for 150mm/0,1,1,1	3.0 3.00 (3.49)			
3.50	PEN	0.50/0.50/0.75 kg/cm²						
3.80	PEN	1.50/1.00/1.50 kg/cm²		Firm, brown, slightly gravelly silty CLAY. Gravel is fine to medium sized, subangular to subrounded flint and chalk.	3.70 (2.79)			
4.00	SPT	5 N		Off-white, locally light brown CHALK comprising of slightly clayey, gravelly SILT. Gravel is fine sized angular flint and subangular chalk. (CIRIA Chalk Grade Dm). 4.00 - 4.45 m: SPT: 2 for 150mm/1,2,1,1 4.00 - 5.45 m: Installation backfilled with chalk.	4.0 4.00 (2.49)		LCNF	
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 4.80m bgl.

Surface Elevation Level:
6.49

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS05

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
5.00	SPT	15 N		Continued from 4.00m bgl: Off-white, locally light brown CHALK comprising of slightly clayey, gravelly SILT. Gravel is fine sized angular flint and subangular chalk. (CIRIA Chalk Grade Dm).	5.0 5.00 (1.49)		LCNF	
				CHALK as silty GRAVEL recovered as white, off-white gravelly silt (CIRIA Chalk Grade Dc). 5.00 - 5.45 m: SPT: 11 for 150mm/6,5,4,4	5.45 (1.04)			
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.
Water seepage at 4.80m bgl.

Surface Elevation Level:
6.49

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS06

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			Friable, brown, slightly humic silty TOPSOIL.			TS/MG	
					0.25 (5.88)			
0.40	J2			Stiff, friable, orange brown slightly sandy silty CLAY. Sand is fine sized.			RIVER TERRACE DEPOSITS	
0.90	PEN	4.50/4.50/4.50 kg/cm²						
1.00	J3 SPT D1	10 N		1.00 - 1.45 m: SPT: 4 for 150mm/2,2,3,3	1.0			
1.50	PEN	4.00/4.50/4.00 kg/cm²						
					1.90 (4.23)			
2.00	SPT D2	16 N		Stiff, brown, light brown, mottled orange brown, slightly gravelly, slightly sandy silty CLAY. Gravel is fine to medium sized, angular to subangular, predominantly chalk with frequent subangular flint. 2.00 - 2.45 m: SPT: 3 for 150mm/2,4,5,5	2.0			
2.50	PEN	3.00/3.00/3.00 kg/cm²						
				2.70 m: Increasing locally to gravelly silty CLAY. Gravel is chalk.				
3.00	SPT	10 N		3.00 - 3.45 m: SPT: 8 for 150mm/2,3,2,3	3.0			
3.50	D3							
					3.80 (2.33)			
4.00	SPT	8 N		Off-white, light brown CHALK comprising of slightly clayey gravelly SILT. Gravel (20%) is subangular chalk. 4.00 - 4.45 m: SPT: 4 for 150mm/2,2,2,2 4.00 - 5.45 m: Installation backfilled with chalk.	4.0		LCNF	
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.13

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS06

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
5.00	SPT	11 N		Continued from 3.80m bgl: Off-white, light brown CHALK comprising of slightly clayey gravelly SILT. Gravel (20%) is subangular chalk. 5.00 - 5.45 m: SPT: 4 for 150mm/3,2,3,3	5.0 5.45 (0.68) 6.0 7.0 8.0 9.0		LCNF	

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.13

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS07

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.20	J1			Friable, brown, slightly humic silty TOPSOIL.	0.30 (5.31)		TS	
0.50	J2			Stiff, friable, orange brown, slightly sandy silty CLAY. Sand is fine sized.			RIVER TERRACE DEPOSITS	
0.58	PEN	2.50/2.50/2.50 kg/cm²						
0.90	PEN	4.50/4.50/4.50 kg/cm²			1.0			
1.00	J3 SPT D1	9 N		1.00 - 1.45 m: SPT: 3 for 150mm/2,2,2,3				
1.50	PEN	2.00/2.00/2.00 kg/cm²						
2.00	SPT	5 N		1.90 m: Coarse gravel of flint. 2.00 - 2.45 m: SPT: 4 for 150mm/1,1,2,1	2.0			
				Stiff, brown, light brown, slightly sandy, slightly gravelly silty CLAY. Gravel is fine to medium sized, predominant chalk with frequent flint.	2.20 (3.41)			
2.50	PEN D2	0.50/1.00/0.50 kg/cm²		Soft brown and light brown locally grey, slightly sandy clayey SILT.	2.45 (3.16)			
				Off-white, locally light brown CHALK comprising of slightly clayey gravelly (20%) SILT. Gravel is fine to medium sized, subangular chalk and flint.	2.65 (2.96)		LEWES CHALK NODULAR FORMATION	
3.00	SPT	13 N		3.00 - 3.45 m: SPT: 5 for 150mm/3,3,4,3	3.0			
3.50	PEN	2.50/2.00/2.50 kg/cm²						
4.00	SPT D3	29 N		CHALK of rock quality recovered as off-white, white gravelly silt (CIRIA Chalk Grade A-C, 1-5). 4.00 - 4.45 m: SPT: 4 for 150mm/5,7,9,8	4.0 4.00 (1.61)			
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
5.61

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS07

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
				Continued from 4.00m bgl: CHALK of rock quality recovered as off-white, white gravelly silt (CIRIA Chalk Grade A-C, 1-5).	5.0		LCNF	
5.00	SPT	26 N		5.00 - 5.45 m: SPT: 12 for 150mm/6,6,6,8	5.45 (0.16)			
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
5.61

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS08

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			Friable, brown, slightly humic silty TOPSOIL.			TS	
					0.30 (4.39)			
				Stiff, friable, orange brown, slightly sandy silty CLAY. Sand is fine sized.				
0.50	PEN 2.00/2.50/2.50 J2	kg/cm²						
0.90	J3				0.90 (3.79)			
1.00	PEN 4.50/4.50/4.50 SPT D1	kg/cm² 15 N		Stiff, friable brown, light brown, orange brown and grey brown, slightly sandy, slightly gravelly silty CLAY. Gravel is fine sized, angular to subangular flint and occasional chalk. 1.00 - 1.45 m: SPT: 5 for 150mm/4,3,4,4	1.0			
1.50	PEN 4.00/4.00/4.00	kg/cm²						
1.75	PEN 3.00/3.50/3.50	kg/cm²						
2.00	SPT D2	9 N		2.00 - 2.45 m: SPT: 3 for 150mm/1,3,2,3	2.0		RIVER TERRACE DEPOSITS	
2.20	PEN 3.00/3.00/3.00	kg/cm²						
				2.40 - 2.50 m: Orange brown silty, fine sized sand. 2.50 m: Increasing sand content remaining slightly sandy, slightly gravelly silty CLAY.				
2.80	PEN 3.00/2.50/3.00	kg/cm²						
3.00	SPT D3	9 N		3.00 - 3.45 m: SPT: 4 for 150mm/1,2,3,3	3.0			
3.50	PEN 3.00/2.50/2.00	kg/cm²						
4.00	SPT	17 N		4.00 - 4.45 m: SPT: 6 for 150mm/4,4,4,5	4.0			
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
4.69

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS08

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
4.50	PEN 3.00/2.50/2.50	kg/cm²		Continued from 0.9m bgl: Stiff, friable brown, light brown, orange brown and grey brown, slightly sandy, slightly gravelly silty CLAY. Gravel is fine sized, angular to subangular flint and occasional chalk.	4.70 -(0.01)		RTD	
5.00	SPT	27 N		Off-white, locally brown, light brown CHALK of silty GRAVEL recovered as clayey, gravelly (15%) silt. Gravel is flint and chalk. (CIRIA Grade Dc). 5.00 - 5.45 m: SPT: 10 for 150mm/6,5,7,9 5.35 m: Possible cobble.	5.0 5.45 -(0.76)		LCNF	
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
4.69

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS09

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
				Friable, brown, slightly humic silty TOPSOIL.				
0.20	J1						TS	
				Stiff, friable, orange brown, slightly sandy silty CLAY.	0.30 (5.58)			
0.60	J2							
0.80	J3							
				0.90 m: Coarse sized gravel.	1.0			
1.00	PEN 4.50/4.50/4.50 SPT	kg/cm² 7 N		1.00 - 1.45 m: SPT: 3 for 150mm/2,2,2,1			RIVER TERRACE DEPOSITS	
1.50	PEN 1.50/1.00/2.00 D1	kg/cm²		1.50 m: Becoming firm, locally stiff.				
					2.0			
2.00	PEN 1.50/1.00/1.50 SPT	kg/cm² 10 N		Off-white, locally brown CHALK comprising of slightly clayey gravelly (25%) SILT. Gravel is medium sized, angular flint and fine to medium sized, subrounded very weak chalk (CIRIA Chalk Grade Dm).	2.00 (3.88)			
				2.00 - 2.45 m: SPT: 4 for 150mm/1,3,3,3				
2.50	D2							
				2.80 m: Wet soils.				
					3.0			
3.00	SPT	14 N		3.00 - 3.45 m: SPT: 5 for 150mm/4,4,3,3			LEWES NODULAR CHALK FORMATION	
					4.0			
4.00	SPT	18 N		CHALK of silty GRAVEL recovered as off-white, locally brown gravelly silt.	4.00 (1.88)			
				4.00 - 4.45 m: SPT: 7 for 150mm/5,4,4,5				
				4.00 - 5.45 m: Installation backfilled with chalk.				
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.
Slight water seepage at 2.80m bgl.

Surface Elevation Level:
5.88

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS09

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
5.00	SPT	17 N		Continued from 4.00m bgl: CHALK of silty GRAVEL recovered as off-white, locally brown gravelly silt. 5.00 - 5.45 m: SPT: 4 for 150mm/3,3,5,6	5.0 5.45 (0.43) 6.0 7.0 8.0 9.0		LNCF	

General Remarks:
Borehole terminated at 5.45m bgl.
Slight water seepage at 2.80m bgl.

Surface Elevation Level:
5.88

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS10

Sheet 1 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
0.10	J1			Friable, brown, slightly humic silty TOPSOIL			TS	
					0.30 (5.70)			
				Stiff, friable, orange brown, brown gravelly silty CLAY. Gravel is fine to medium sized angular flint.				
0.50	PEN 3.00/2.50/2.50 kg/cm²							
0.60	J2							
0.70	PEN 4.50/4.50/4.50 kg/cm²							
0.80	J3							
1.00	SPT D1	12 N			1.0 1.00 (5.00)			
				Stiff, friable, desiccated orange brown silty CLAY. 1.00 - 1.45 m: SPT: 4 to 150mm/3,3,2,4				
1.50	PEN 4.50/4.50/4.50 kg/cm²							
					1.90 (4.10)			
2.00	SPT	7 N		Loose and medium dense, orange brown, brown, silty, very gravelly, typically fine sized SAND. Gravel is fine to medium grained flint. 2.00 - 2.45 m: SPT: 3 to 150mm/2,2,2,1	2.0		RIVER TERRACE DEPOSITS	
2.50	D2							
3.00	SPT	15 N		3.00 - 3.45 m: SPT: 6 to 150mm/2,3,4,6 3.00 - 3.50 m: Samples wet.	3.0			
					3.30 (2.70)			
3.50	D3			Medium, dense, brown, silty SAND AND GRAVEL of chalk and flint. Locally stiff clay of silty, sandy, gravelly CLAY.				
4.00	SPT	15 N			4.0 4.00 (2.00)			
				Stiff, light brown and mottled orange brown, slightly sandy gravelly silty CLAY. Gravel is fine sized, subrounded, chalk with occasional fine, angular flint. Increasing chalk content throughout. Locally grades to silty CLAY/clayey SILT. 4.00 - 4.45 m: SPT: 11 to 150mm/4,3,4,4				
					4.50			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.00

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

PROBEHOLE RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: A Plant
Date Commenced: 14/09/2017
Date Completed: 14/09/2017
Method Used: Windowless Percussive Sampling Rig

Borehole No.

WS10

Sheet 2 of 2

Samples & Tests			Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value						
4.50	PEN 3.00/3.00/3.00	kg/cm²		Continued from 4.00m bgl: Stiff, light brown and mottled orange brown, slightly sandy gravelly silty CLAY. Gravel is fine sized, subrounded, chalk with occasional fine, angular flint. Increasing chalk content throughout. Locally grades to silty CLAY/clayey SILT.	5.0 5.00 (1.00)		RTD	
4.80	PEN 2.50/2.50/2.50	kg/cm²						
5.00	SPT	27 N		Off-white and pale brown CHALK, comprising of slightly clayey gravelly (10%) SILT. Gravel is subangular with very weak chalk (CIRIA Chalk Grade Dm). 5.00 - 5.45 m: SPT: 13 to 150mm/7,7,4,9	5.45 (0.55)		LCNF	
					6.0			
					7.0			
					8.0			
					9.0			

General Remarks:
Borehole terminated at 5.45m bgl.

Surface Elevation Level:
6.00

All dimensions in metres
Log Scale 1:25

BRD

[redacted]

INSPECTION PIT RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: H Kuusanniemi-Abbotts
Date Completed: 14/09/2017
Method Used: Hand Dug

Pit No.

HD01

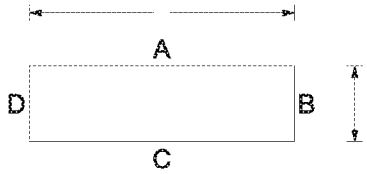
Sheet 1 of 1

Samples & Tests			Description of Strata	Depth / (Level)	Geology	Legend
Depth	Type & No	Value				
0.15	J1		Light orange brown, slightly sandy, silty clay TOPSOIL. Rare medium, subangular flint gravel, rootlets. Rare charcoal.		TS	
			Orange brown, sandy CLAY, with rare subangular to subrounded flint and chalk gravel.	0.30 (0)	RTD	
				0.50 (0)		
				1		

Pit Stability: Generally stable throughout
Groundwater: Not encountered

Surface Elevation Level:

Plan of Inspection Pit:



General Remarks:
Hand dug pit terminated at 0.50m bgl.

All dimensions in metres
Log Scale 1:10

BRD

[redacted]

INSPECTION PIT RECORD

Client: Trustees of the Langmead Pension Scheme
Project Title: Drove Lane, Yapton
Project No: BRD2934
Logged By: H Kuusanniemi-Abbotts
Date Completed: 14/09/2017
Method Used: Hand Dug

Pit No.

HD02

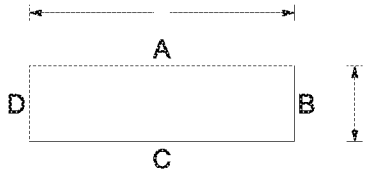
Sheet 1 of 1

Samples & Tests			Description of Strata	Depth / (Level)	Geology	Legend
Depth	Type & No	Value				
0.15	J1		Light orange brown, slightly sandy, silty clay TOPSOIL. Rare medium, subangular flint gravel, rootlets.		TS	
			Orange brown, sandy CLAY.	0.30 (0)	RTD	
				0.75 (0)		
				1		

Pit Stability: Generally stable throughout
Groundwater: Not encountered

Surface Elevation Level:

Plan of Inspection Pit:



General Remarks:
Hand dug pit terminated at 0.75m bgl.

All dimensions in metres
Log Scale 1:10

BRD

[redacted]

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

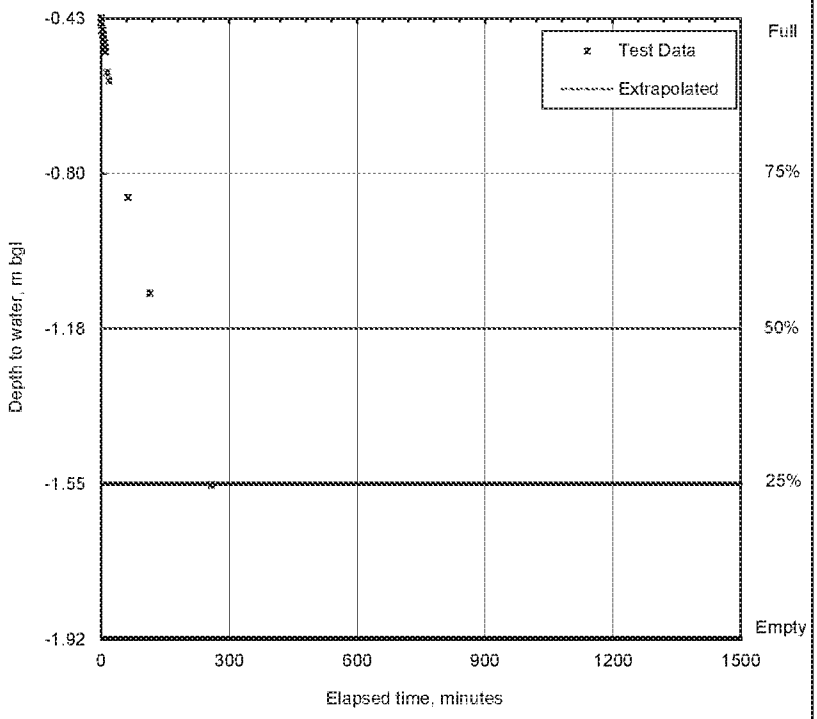
Test Details

Trial Pit Number	TP01	
Test Number	1	
Pit Depth	1.92	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	12/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.43
1	0.44
3	0.46
4	0.46
5	0.47
7	0.48
8	0.49
9	0.50
10	0.51
15	0.56
20	0.58
63	0.86
114	1.09
260	1.55

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (54 mins) is the time for the water level to fall to 75% effective depth (0.80m bgl)

and T25 (259 mins) is the time for the water level to fall to 25% effective depth (1.55m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 205 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 0.94 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.28 m²

Soil Infiltration Rate *f* = 1.44×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

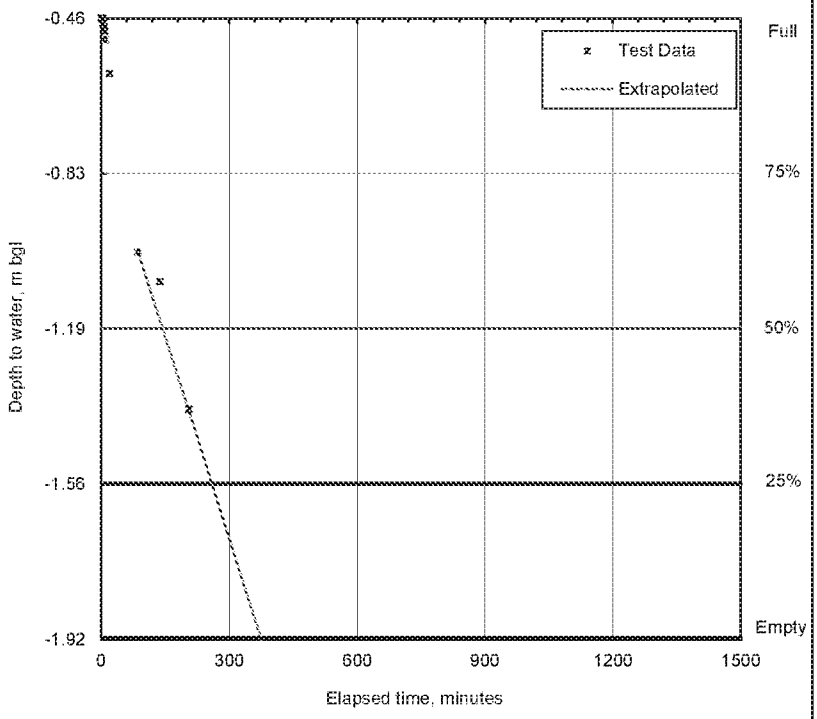
Test Details

Trial Pit Number	TP01	
Test Number	2	
Pit Depth	1.92	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	13/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.46
2	0.46
3	0.46
4	0.46
5	0.47
6	0.47
7	0.48
8	0.49
10	0.51
20	0.59
87	1.01
138	1.08
206	1.38

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (57 mins) is the time for the water level to fall to 75% effective depth (0.83m bgl)

and T25 (260* mins) is the time for the water level to fall to 25% effective depth (1.56m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 202 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 0.92 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.20 m²

Soil Infiltration Rate *f* = $\underline{1.46 \times 10^{-5}}$ m/s

Comments Calculation based on extrapolated results. Use as a guide only. Pit dry next day at 966 minutes.

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

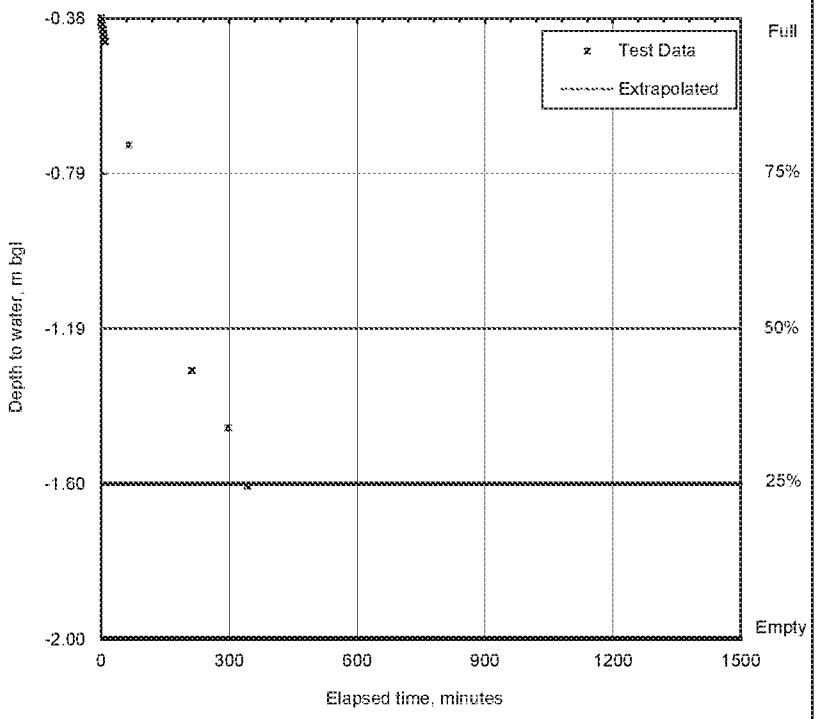
Test Details

Trial Pit Number	TP01	
Test Number	3	
Pit Depth	2.00	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	14/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.38
1	0.39
2	0.40
3	0.40
4	0.41
5	0.41
6	0.42
7	0.43
8	0.44
9	0.44
10	0.44
65	0.71
213	1.30
298	1.45
344	1.60

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (84 mins) is the time for the water level to fall to 75% effective depth (0.79m bgl)

and T25 (342 mins) is the time for the water level to fall to 25% effective depth (1.60m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 259 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.02 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.63 m²

Soil Infiltration Rate *f* = 1.17×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

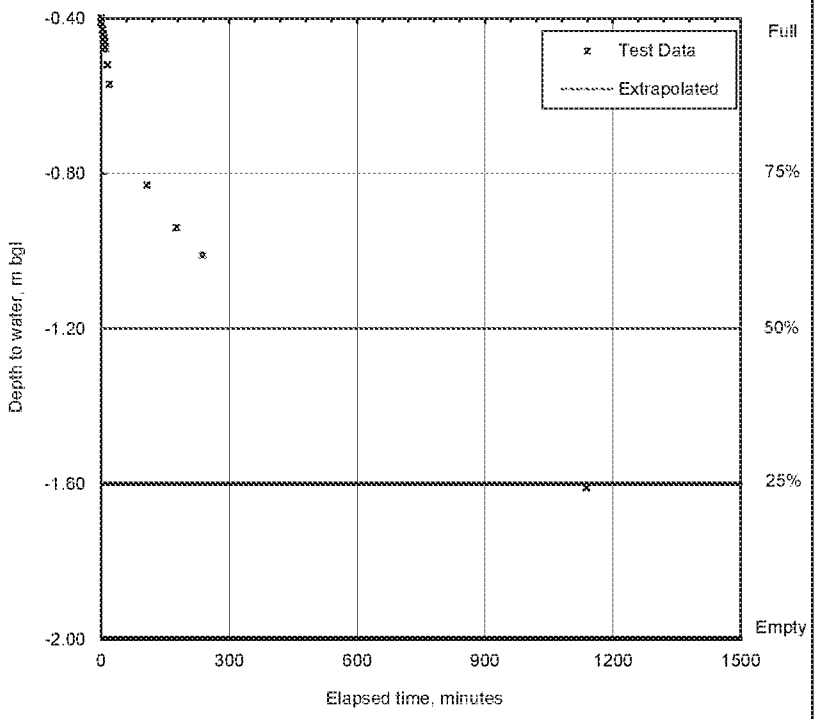
Test Details

Trial Pit Number	TP02	
Test Number	1	
Pit Depth	2.00	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	12/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.40
1	0.41
2	0.41
4	0.43
5	0.44
6	0.45
7	0.45
8	0.46
9	0.47
10	0.48
15	0.52
20	0.57
109	0.83
177	0.94
236	1.01
1138	1.61

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (99 mins) is the time for the water level to fall to 75% effective depth (0.80m bgl)

and T25 (1123 mins) is the time for the water level to fall to 25% effective depth (1.60m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 1024 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.01 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.58 m²

Soil Infiltration Rate *f* = 2.94×10^{-6} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

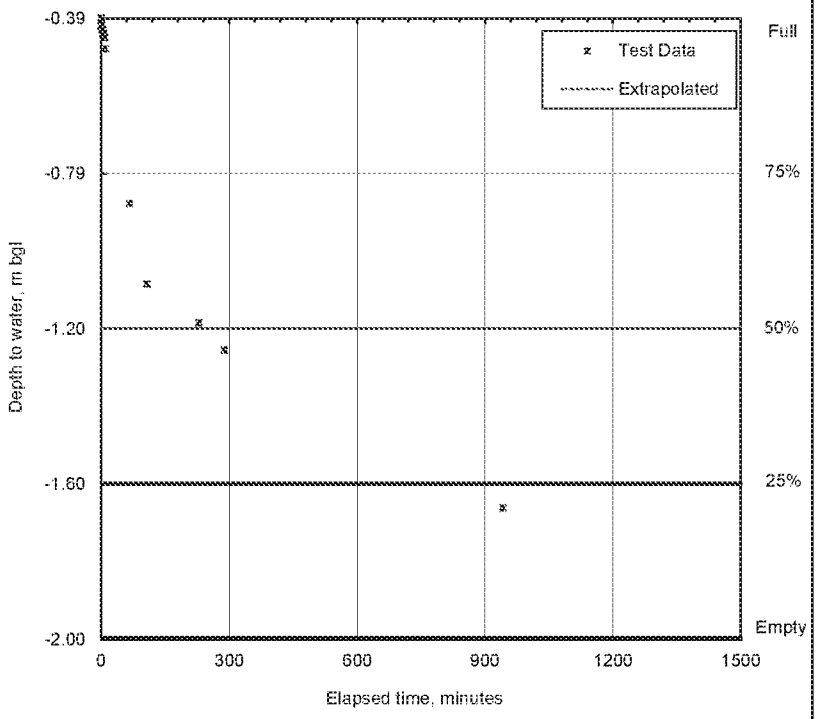
Test Details

Trial Pit Number	TP02	
Test Number	2	
Pit Depth	2.00	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	1.60	
Date of Test	13/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.39
1	0.41
2	0.41
3	0.42
4	0.42
5	0.43
6	0.43
7	0.44
8	0.44
10	0.47
68	0.87
107	1.08
230	1.18
290	1.25
942	1.66

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (57 mins) is the time for the water level to fall to 75% effective depth (0.79m bgl)

and T25 (843 mins) is the time for the water level to fall to 25% effective depth (1.60m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 786 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.01 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.61 m²

Soil Infiltration Rate *f* = 3.84×10^{-6} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

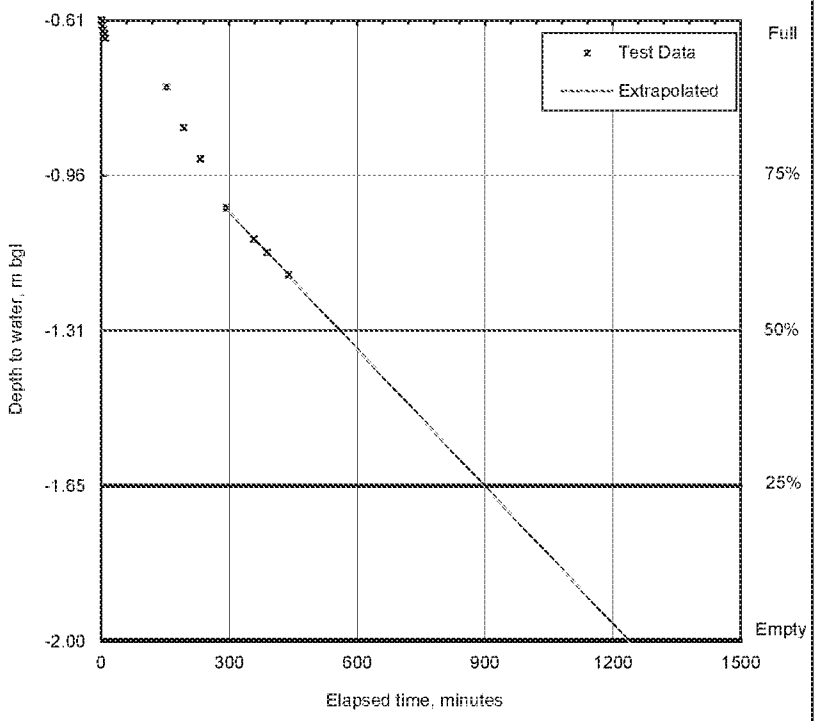
Test Details

Trial Pit Number	TP02	
Test Number	3	
Pit Depth	2.00	m
Pit Length	2.10	m
Pit Width	0.60	m
Depth to groundwater prior to test	1.66	m
Date of Test	14/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.61
2	0.61
3	0.62
4	0.62
5	0.63
6	0.64
7	0.64
8	0.64
9	0.65
10	0.65
154	0.76
194	0.85
234	0.92
293	1.03
359	1.10
390	1.13
439	1.18

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (254 mins) is the time for the water level to fall to 75% effective depth (0.96m bgl)

and T25 (899* mins) is the time for the water level to fall to 25% effective depth (1.65m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 645 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 0.88 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.01 m²

Soil Infiltration Rate *f* = 4.51×10^{-6} m/s

Comments Calculation based on extrapolated results. Use as a guide only.

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

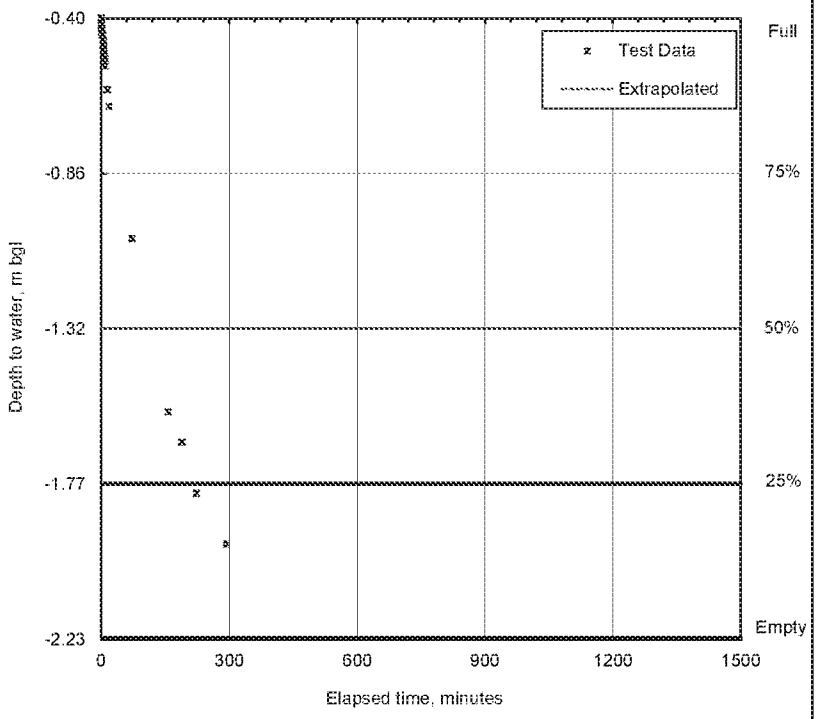
Test Details

Trial Pit Number	TP03	
Test Number	1	
Pit Depth	2.23	m
Pit Length	2.30	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	12/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.40
1	0.42
2	0.43
3	0.44
4	0.45
5	0.47
6	0.48
7	0.49
8	0.51
9	0.52
10	0.54
15	0.61
20	0.66
72	1.05
156	1.56
190	1.65
223	1.80
293	1.95

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (46 mins) is the time for the water level to fall to 75% effective depth (0.86m bgl)

and T25 (217 mins) is the time for the water level to fall to 25% effective depth (1.77m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 171 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.26 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 6.69 m²

Soil Infiltration Rate *f* = 1.84×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

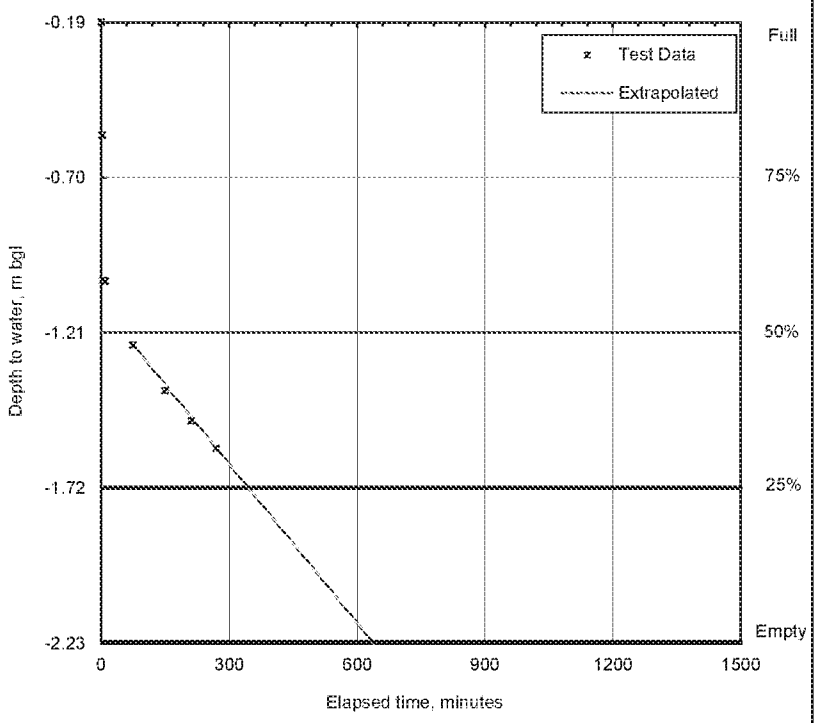
Test Details

Trial Pit Number	TP03	
Test Number	2	
Pit Depth	2.23	m
Pit Length	2.30	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	13/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.19
3	0.56
4	1.04
5	1.04
6	1.04
8	1.04
9	1.04
10	1.04
75	1.25
150	1.40
211	1.50
271	1.59

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (3.3 mins) is the time for the water level to fall to 75% effective depth (0.70m bgl)

and T25 (345* mins) is the time for the water level to fall to 25% effective depth (1.72m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 342 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.41 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 7.30 m²

Soil Infiltration Rate *f* = $\underline{9.40 \times 10^{-6}}$ m/s

Comments Calculation based on extrapolated results. Use as a guide only. Pit was dry next day at 733 minutes.

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

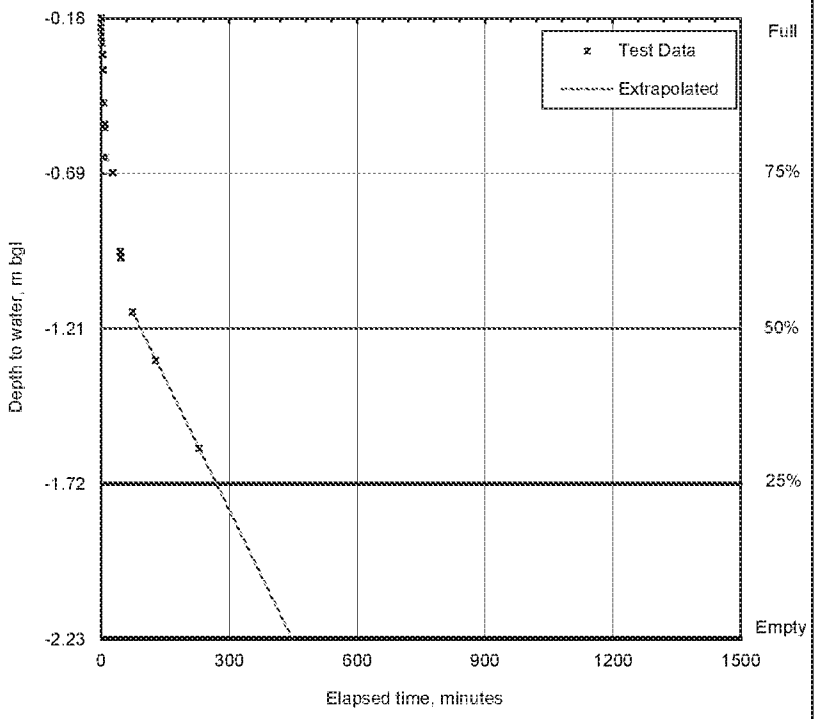
Test Details

Trial Pit Number	TP03	
Test Number	3	
Pit Depth	2.23	m
Pit Length	2.30	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	14/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.18
1	0.21
2	0.24
3	0.26
4	0.30
5	0.35
6	0.46
7	0.53
8	0.53
9	0.54
10	0.64
28	0.69
45	0.95
47	0.97
74	1.15
128	1.31
230	1.60

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (28 mins) is the time for the water level to fall to 75% effective depth (0.69m bgl)

and T25 (271* mins) is the time for the water level to fall to 25% effective depth (1.72m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 243 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.41 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 7.33 m²

Soil Infiltration Rate *f* = 1.33×10^{-5} m/s

Comments Calculation based on extrapolated results. Use as a guide only.

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

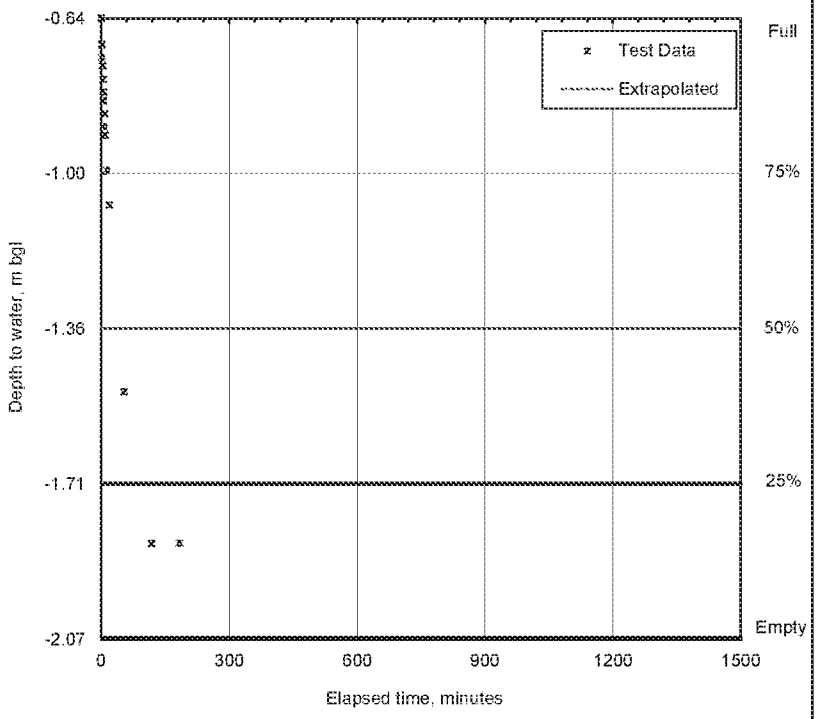
Test Details

Trial Pit Number	TP04	
Test Number	1	
Pit Depth	2.07	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	12/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.64
2	0.70
3	0.73
4	0.75
5	0.78
6	0.81
7	0.83
8	0.86
9	0.89
10	0.91
15	0.99
20	1.07
54	1.50
119	1.85
184	1.85

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (15 mins) is the time for the water level to fall to 75% effective depth (1.00m bgl)

and T25 (93 mins) is the time for the water level to fall to 25% effective depth (1.71m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 78 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.03 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.73 m²

Soil Infiltration Rate *f* = 3.84×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

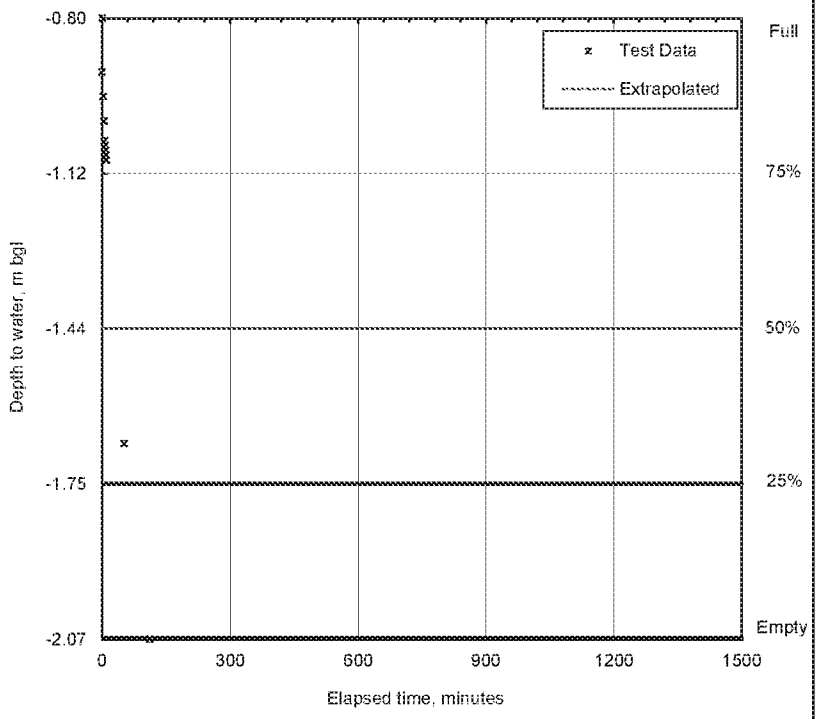
Test Details

Trial Pit Number	TP04	
Test Number	2	
Pit Depth	2.07	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	13/02/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.80
1	0.91
3	0.96
5	1.01
6	1.05
7	1.06
8	1.07
9	1.08
10	1.09
52	1.67
112	2.07

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (12 mins) is the time for the water level to fall to 75% effective depth (1.12m bgl)

and T25 (64 mins) is the time for the water level to fall to 25% effective depth (1.75m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 52 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 0.91 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.25 m²

Soil Infiltration Rate *f* = 5.54×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

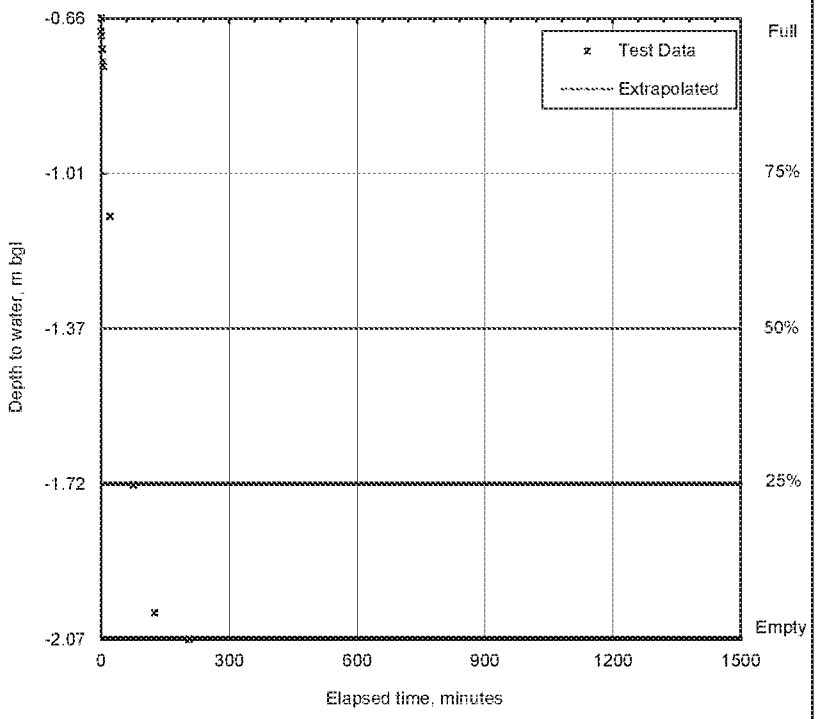
Test Details

Trial Pit Number	TP04	
Test Number	3	
Pit Depth	2.07	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	13/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.66
1	0.69
2	0.70
3	0.73
4	0.76
5	0.77
21	1.11
76	1.72
127	2.01
206	2.07

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (16 mins) is the time for the water level to fall to 75% effective depth (1.01m bgl)

and T25 (76 mins) is the time for the water level to fall to 25% effective depth (1.72m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 59 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.02 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.67 m²

Soil Infiltration Rate *f* = 5.03×10^{-5} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

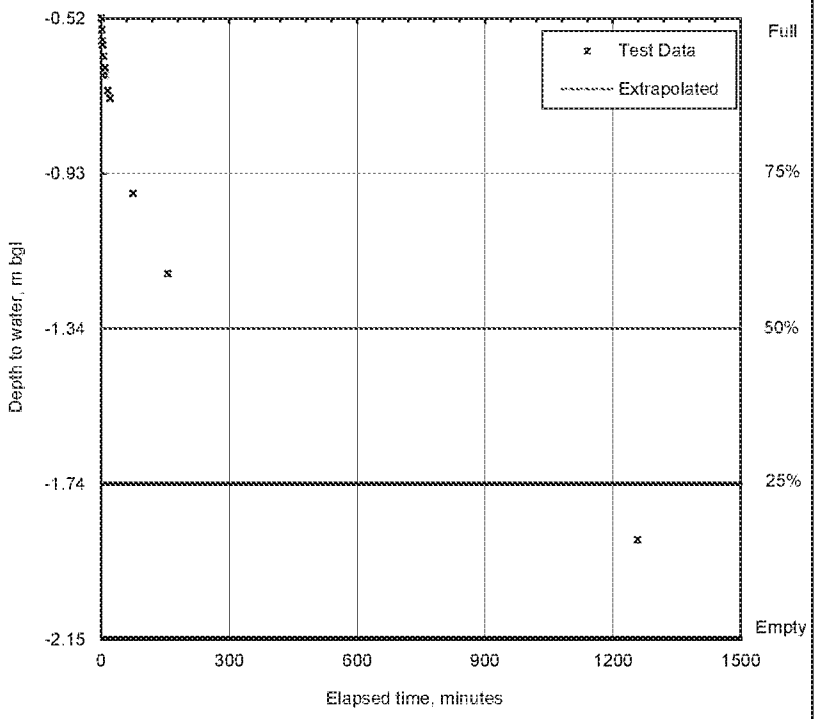
Test Details

Trial Pit Number	TP05	
Test Number	1	
Pit Depth	2.15	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	Dry	m
Date of Test	12/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.52
2	0.55
3	0.58
4	0.59
6	0.62
8	0.65
9	0.65
10	0.67
16	0.71
21	0.73
75	0.98
157	1.19
1258	1.89

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (64 mins) is the time for the water level to fall to 75% effective depth (0.93m bgl)

and T25 (1026 mins) is the time for the water level to fall to 25% effective depth (1.74m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 962 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.17 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 6.33 m²

Soil Infiltration Rate *f* = 3.21×10^{-6} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

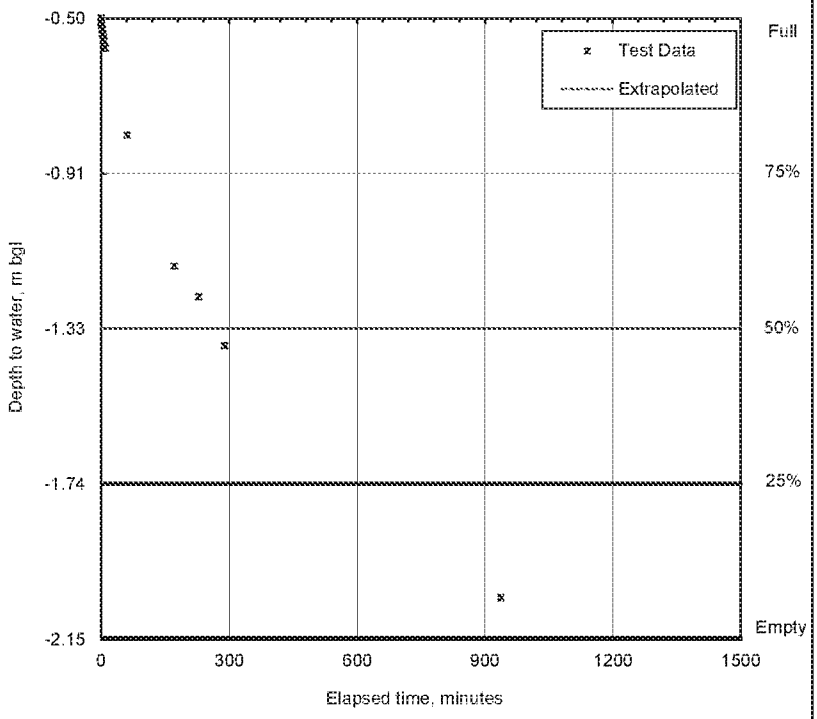
Test Details

Trial Pit Number	TP05	
Test Number	2	
Pit Depth	2.15	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	1.89	m
Date of Test	13/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.50
1	0.51
2	0.52
3	0.53
4	0.54
5	0.55
6	0.56
7	0.56
8	0.58
10	0.58
62	0.81
172	1.16
229	1.24
290	1.37
937	2.04

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (94 mins) is the time for the water level to fall to 75% effective depth (0.91m bgl)

and T25 (645 mins) is the time for the water level to fall to 25% effective depth (1.74m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 551 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.19 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 6.39 m²

Soil Infiltration Rate *f* = 5.63×10^{-6} m/s

Comments

SOAKAGE TEST RECORD

SOIL INFILTRATION RATE

(BRE Digest 365 : Soakaway Test)

Client:	**Trustees of the Langmead Pension Scheme**
Project Title	**Drove Lane, Yapton**
Project No.	**BRD2934**

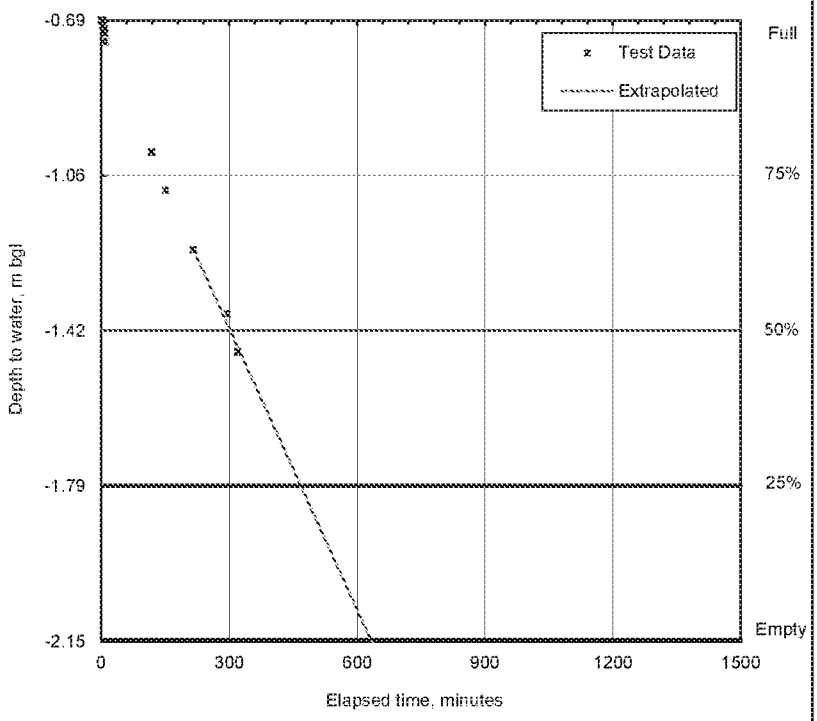
Test Details

Trial Pit Number	TP05	
Test Number	3	
Pit Depth	2.15	m
Pit Length	2.40	m
Pit Width	0.60	m
Depth to groundwater prior to test	2.04	m
Date of Test	14/09/2017	
Logged by	Henrik K-Abbotts	
Description of Soil under Test		

Test Record

Elapsed Time min	Depth to Water m
0	0.69
1	0.69
2	0.69
3	0.69
4	0.69
5	0.70
6	0.70
7	0.71
8	0.72
10	0.74
119	1.00
152	1.09
217	1.23
297	1.38
320	1.47

Plot of water level against elapsed time



Summary of Calculations and Result

Soil infiltration rate, *f*, is calculated from the time taken for the water to fall from 75% to 25% effective storage depth in the pit.

***f* = (V75-V25)/A50(T75-T25)**

where, T75 (139 mins) is the time for the water level to fall to 75% effective depth (1.06m bgl)

and T25 (468* mins) is the time for the water level to fall to 25% effective depth (1.79m bgl)

thus, T75-T25 is the time for the water level to fall from 75% to 25% effective depth:

T75-T25 = 329 mins

V75-V25 is the effective storage volume in the trial pit between 75% and 25% effective depth:

V75-V25 = 1.05 m³

and A50 is the internal surface area of the trial pit up to 50% effective depth and including the base area:

A50 = 5.82 m²

Soil Infiltration Rate *f* = 9.14×10^{-6} m/s

Comments Calculation based on extrapolated results. Use as a guide only.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	26/09/2017	Ground conditions:	Moist	Recorded by:	AN
Time at start:	14:20	Weather conditions:	Sunny with a few scattered clouds	Pressure trend:	Steady
Time at finish:	15:40	Air Temperature (°C):	20	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.64	2.50	3.88	0.0	3.6	17.4	0.0	3.6	17.4	0	0	1022	0.1	22.2	
WS02	3.08	2.96	3.98	0.0	3.5	17.5	0.0	3.5	17.5	0	0	1023	0.1	21.3	
WS05	Dry	Dry	4.00	0.0	1.8	17.3	0.0	1.8	17.3	0	0	1023	0.1	30.3	
WS06	Dry	Dry	3.98	0.0	1.9	18.0	0.0	1.9	18.0	0	0	1023	0.1	23.7	
WS08	2.79	2.63	3.86	0.0	2.4	16.8	0.0	2.4	16.8	1	0	1023	0.1	35.4	
WS09	3.43	3.31	3.91	0.0	3.1	17.9	0.0	3.2	17.9	0	0	1023	0.1	30.5	
WS10	3.69	3.54	4.00	0.0	3.7	17.4	0.0	3.7	17.4	0	0	1023	0.1	30.9	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	03/10/2017	Ground conditions:	Moist becoming drier	Recorded by:	AN
Time at start:	13:00	Weather conditions:	Sunny with a few scattered clouds	Pressure trend:	Rising
Time at finish:	14:15	Air Temperature (°C):	17	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.48	2.34	3.86	0.0	3.9	16.4	0.0	3.9	16.4	0	0	1025	0.1	26.0	
WS02	2.92	2.79	3.97	0.0	3.7	17.6	0.1	3.7	17.6	0	0	1025	0.0	31.8	
WS05	Dry	Dry	4.00	0.0	0.3	20.3	0.0	0.9	19.8	0	0	1025	0.2	17.0	
WS06	Dry	Dry	3.98	0.0	0.8	19.6	0.0	0.8	19.6	0	0	1025	0.1	28.4	
WS08	2.51	2.34	3.86	0.0	2.1	17.4	0.0	2.2	17.4	0	0	1025	0.0	35.0	
WS09	3.32	3.19	3.91	0.0	3.2	18.0	0.1	3.3	17.9	0	0	1026	0.2	23.4	
WS10	3.55	3.41	4.00	0.0	4.1	17.1	0.0	4.1	17.1	0	0	1026	0.2	24.1	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	11/10/2017	Ground conditions:	Wet becoming drier	Recorded by:	AN
Time at start:	08:45	Weather conditions:	Cloudy with a rare sunny spell	Pressure trend:	Falling
Time at finish:	09:50	Air Temperature (°C):	16	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.53	2.39	3.86	0.1	3.8	16.4	0.1	3.8	16.4	0	0	1014	0.3	17.3	
WS02	2.99	2.87	3.97	0.1	3.6	17.7	0.1	3.7	17.7	0	0	1014	0.2	22.0	
WS05	Dry	Dry	4.00	0.0	0.1	21.1	0.1	0.2	20.5	0	0	1014	0.2	12.1	
WS06	Dry	Dry	3.98	0.1	0.7	20.9	0.1	0.7	20.8	0	0	1014	0.3	20.7	
WS08	2.57	3.41	3.87	0.1	2.4	18.0	0.2	2.4	18.0	0	0	1014	0.2	26.5	
WS09	3.31	3.18	3.91	0.1	2.9	19.0	0.1	3.0	19.0	0	0	1014	0.3	17.8	
WS10	3.54	3.40	4.00	0.1	3.5	18.1	0.1	3.5	18.1	0	0	1014	0.2	19.3	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	17/10/2017	Ground conditions:	Damp	Recorded by:	AN
Time at start:	13:20	Weather conditions:	Overcast	Pressure trend:	Rising
Time at finish:	15:05	Air Temperature (°C):	18	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.58	2.46	3.81	0.0	3.8	16.5	0.0	3.9	16.5	0	0	1021	0.1	14.4	
WS02	3.06	2.95	3.97	0.1	3.5	17.5	0.1	3.5	17.4	0	0	1021	0.0	15.2	
WS05	Dry	Dry	4.01	0.1	0.4	20.3	0.1	0.7	19.8	0	0	1020	0.0	13.2	
WS06	Dry	Dry	3.97	0.1	0.5	20.0	0.1	0.5	20.0	0	0	1020	0.2	15.5	
WS08	2.64	2.48	3.87	0.1	2.4	17.7	0.1	2.4	17.7	0	0	1020	0.2	20.4	
WS09	3.35	3.22	3.91	0.1	2.9	18.4	0.1	2.9	18.4	0	0	1020	0.1	13.1	
WS10	3.60	3.46	4.00	0.1	3.2	18.1	0.1	3.2	18.1	0	0	1020	0.3	12.1	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	25/10/2017	Ground conditions:	Damp	Recorded by:	AN
Time at start:	12:30	Weather conditions:	Overcast	Pressure trend:	Steady
Time at finish:	13:40	Air Temperature (°C):	17	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.52	2.40	3.82	0.1	3.7	17.1	0.1	3.7	17.1	0	0	1022	0.3	14.4	
WS02	2.98	2.86	3.97	0.1	3.5	17.7	0.1	3.5	17.7	0	0	1022	0.2	16.9	
WS05	Dry	Dry	4.01	0.1	0.7	19.8	0.1	0.7	19.7	0	0	1022	0.2	16.5	
WS06	Dry	Dry	3.98	0.1	0.4	20.2	0.1	0.4	20.2	0	0	1022	0.1	16.7	
WS08	2.58	2.41	3.88	0.1	1.5	18.4	0.1	1.6	18.4	0	0	1023	0.1	18.7	
WS09	3.32	3.19	3.90	0.1	2.8	18.8	0.1	2.8	18.8	0	0	1023	0.1	13.6	
WS10	3.54	3.40	4.00	0.1	3.0	18.5	0.1	3.0	18.5	0	0	1023	0.1	12.3	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Gas Monitoring Record

Project Name: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Date:	31/10/2017	Ground conditions:	Moist	Recorded by:	AN
Time at start:	09:50	Weather conditions:	Cloudy with a few sunny spells	Pressure trend:	Steady
Time at finish:	10:50	Air Temperature (°C):	13	Monitor serial no:	G501688

The gas monitoring equipment is a Geotech GA5000 portable analyser. As per manufacturers recommendations this is factory calibrated every six months and in addition BRD undertake calibration checks against bottled standard gases on at least a monthly basis. Gas monitor pump is run for three minutes unless otherwise stated and the steady readings are an average reading taken over this pump run time. Vapour monitoring equipment is miniRAE lite PGM-7350 Photo Ionisation Detector (PID) with 10.6 eV lamp calibrated for isobutylene. PID calibration check is performed on site against ambient air and also against a 100ppm isobutylene standard gas. Barometric pressure trend and ambient air temperature is recorded from weather websites at the nearest reported weather station.

CH_4 = Methane CO_2 = Carbon Dioxide O_2 = Oxygen H_2S = Hydrogen Sulphide CO = Carbon Monoxide NR = Not Recorded PID = Photo Ionisation Detector

GWL = Groundwater level measured from ground surface and top of standpipe. Base = Base of standpipe measured from ground surface.

Monitoring point				Gas Concentration								Pressure	Flow rate	Vapour	Comments
				Steady			Peak		Minimum	Peak					
Borehole	GWL Ground (m)	GWL Pipe (m)	Base Ground (m)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	Baro - metric (mb)	Steady (l/hr)	PID (ppm)	
WS01	2.57	2.45	3.82	0.1	3.0	18.3	0.1	3.0	18.3	0	0	1028	0.1	8.2	
WS02	3.04	2.93	3.97	0.1	3.5	17.5	0.1	3.5	17.5	0	0	1028	0.1	9.8	
WS05	Dry	Dry	4.00	0.1	1.4	18.7	0.2	1.4	18.7	0	0	1028	0.2	10.7	
WS06	Dry	Dry	4.00	0.1	1.5	18.5	0.1	1.5	18.5	0	0	1028	0.2	11.2	
WS08	2.63	2.47	3.86	0.1	2.1	18.6	0.1	2.1	18.6	0	0	1028	0.2	12.5	
WS09	3.32	3.19	3.90	0.1	2.8	19.4	0.1	2.8	19.4	0	0	1028	0.2	9.6	
WS10	3.54	3.40	3.98	0.1	3.2	18.7	0.1	3.2	18.7	0	0	1028	0.2	9.4	

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	26/09/2017	AN	3.88	0.00	2.64	2.50	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	26/09/2017	AN	3.98	0.00	3.08	2.96	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	26/09/2017	AN	4.01	n/a	Dry	Dry	n/a	n/a	
WS06	26/09/2017	AN	3.98	n/a	Dry	Dry	n/a	n/a	
WS08	26/09/2017	AN	3.86	0.00	2.79	2.63	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	26/09/2017	AN	3.91	0.00	3.43	3.31	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	26/09/2017	AN	4.00	0.00	3.69	3.54	n/a	n/a	No odour noted on retrieval of the interface meter.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	03/10/2017	AN	3.86	0.00	2.48	2.34	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	03/10/2017	AN	3.97	0.00	2.92	2.79	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	03/10/2017	AN	4.02	0.00	4.02	3.84	n/a	n/a	No odour noted on retrieval of the interface meter. Water detected at the very bottom of the borehole
WS06	03/10/2017	AN	3.98	n/a	Dry	Dry	n/a	n/a	
WS08	03/10/2017	AN	3.86	0.00	2.51	2.34	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	03/10/2017	AN	3.91	0.00	3.32	3.19	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	03/10/2017	AN	4.00	0.00	3.55	3.41	n/a	n/a	No odour noted on retrieval of the interface meter.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	11/10/2017	AN	3.86	0.00	2.53	2.39	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	11/10/2017	AN	3.97	0.00	2.99	2.87	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	11/10/2017	AN	4.00	n/a	Dry	Dry	n/a	n/a	
WS06	11/10/2017	AN	3.98	n/a	Dry	Dry	n/a	n/a	
WS08	11/10/2017	AN	3.87	0.00	2.57	2.41	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	11/10/2017	AN	3.91	0.00	3.31	3.18	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	11/10/2017	AN	4.00	0.00	3.54	3.40	n/a	n/a	No odour noted on retrieval of the interface meter.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	17/10/2017	AN / SR	3.81	0.00	2.58	2.46	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	17/10/2017	AN / SR	3.97	0.00	3.06	2.95	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	17/10/2017	AN / SR	4.01	n/a	Dry	Dry	n/a	n/a	
WS06	17/10/2017	AN / SR	3.97	n/a	Dry	Dry	n/a	n/a	
WS08	17/10/2017	AN / SR	3.87	0.00	2.64	2.48	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	17/10/2017	AN / SR	3.91	0.00	3.35	3.22	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	17/10/2017	AN / SR	4.00	0.00	3.60	3.46	n/a	n/a	No odour noted on retrieval of the interface meter.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	25/10/2017	AN	3.82	0.00	2.52	2.40	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	25/10/2017	AN	3.97	0.00	2.98	2.86	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	25/10/2017	AN	4.01	n/a	Dry	Dry	n/a	n/a	No odour noted on retrieval of the interface meter.
WS06	25/10/2017	AN	3.98	n/a	Dry	Dry	n/a	n/a	No odour noted on retrieval of the interface meter.
WS08	25/10/2017	AN	3.88	0.00	2.58	2.41	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	25/10/2017	AN	3.90	0.00	3.32	3.19	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	25/10/2017	AN	4.00	0.00	3.54	3.40	n/a	n/a	No odour noted on retrieval of the interface meter.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Groundwater Monitoring Record

Project: Drove Lane, Yapton
Client: Trustees of the Langmead Pension Scheme
Project No: BRD2934

Borehole name	Date	Monitored by (initials)	Borehole depth (m)	Qty free product detected (mm)	Groundwater level below ground surface (m)	Groundwater level below top of standpipe (m)	Amount purged (l)	Post purge groundwater level below top of standpipe (m)	Comments
WS01	31/10/2017	AN	3.82	0.00	2.57	2.45	n/a	n/a	No odour noted on retrieval of the interface meter.
WS02	31/10/2017	AN	3.97	0.00	3.04	2.93	n/a	n/a	No odour noted on retrieval of the interface meter.
WS05	31/10/2017	AN	4.00	n/a	Dry	Dry	n/a	n/a	No odour noted on retrieval of the interface meter.
WS06	31/10/2017	AN	4.00	n/a	Dry	Dry	n/a	n/a	No odour noted on retrieval of the interface meter.
WS08	31/10/2017	AN	3.86	0.00	2.63	2.47	n/a	n/a	No odour noted on retrieval of the interface meter.
WS09	31/10/2017	AN	3.90	0.00	3.32	3.19	n/a	n/a	No odour noted on retrieval of the interface meter.
WS10	31/10/2017	AN	3.98	0.00	3.54	3.40	n/a	n/a	No odour noted on retrieval of the interface meter.

APPENDIX 3

Andy Plant
BRD Environmental Ltd
Hawthorne Villa
1 Old Parr Road
Banbury
Oxfordshire
OX16 5HT

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
[redacted]

4480

QTS Environmental Report No: 17-64372

Site Reference:	Drove Lane, Yapton
Project / Job Ref:	BRD2934
Order No:	None Supplied
Sample Receipt Date:	18/09/2017
Sample Scheduled Date:	18/09/2017
Report Issue Number:	1
Reporting Date:	22/09/2017

Authorised by:
[redacted]
Kevin Old
Associate Director of Laboratory

Authorised by:
[redacted]
Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate						
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17	11/09/17	11/09/17	11/09/17	11/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP01	TP02	TP04	TP07	TP08
Project / Job Ref: BRD2934	Additional Refs	J1	J2	J1	J1	J1
Order No: None Supplied	Depth (m)	0.10	1.00	0.10	0.50	0.20
Reporting Date: 22/09/2017	QTSE Sample No	291019	291020	291021	291022	291023

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025					
pH	pH Units	N/a	MCERTS	6.2	6.4	6.4	7.2	5.9
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	153	66	27	26	25
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.15	0.07	0.03	0.03	0.03
Organic Matter	%	< 0.1	MCERTS	1.9	1.7	1.6	0.6	1.7
Arsenic (As)	mg/kg	< 2	MCERTS	7	8	7	9	7
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.2	0.2	0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	15	17	15	19	15
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	12	11	10	10	10
Lead (Pb)	mg/kg	< 3	MCERTS	20	40	19	10	16
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	11	11	10	15	10
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	40	41	38	39	35

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

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

[redacted]

4480

Soil Analysis Certificate						
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17	12/09/17	12/09/17	12/09/17	12/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP09	TP11	TP12	TP14	TP16
Project / Job Ref: BRD2934	Additional Refs	J2	J1	J1	J1	J2
Order No: None Supplied	Depth (m)	0.50	0.10	0.10	0.10	0.60
Reporting Date: 22/09/2017	QTSE Sample No	291024	291025	291026	291027	291028

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025					
pH	pH Units	N/a	MCERTS	6.2	6.7	6.7	6.3	7.2
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	22	25	18	19	15
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.02	0.02	0.02	0.02	0.01
Organic Matter	%	< 0.1	MCERTS	2.2	1.8	1.6	1.4	0.7
Arsenic (As)	mg/kg	< 2	MCERTS	6	7	7	7	9
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	14	15	16	15	25
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	10	11	10	10	11
Lead (Pb)	mg/kg	< 3	MCERTS	17	21	14	17	12
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	9	11	11	11	18
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	37	39	37	37	47

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate						
QTS Environmental Report No: 17-64372	Date Sampled	12/09/17	12/09/17	13/09/17	13/09/17	13/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP17	TP18	WS01	WS02	WS02
Project / Job Ref: BRD2934	Additional Refs	J1	J1	J1	J1	J2
Order No: None Supplied	Depth (m)	0.20	0.10	0.10	0.10	0.60
Reporting Date: 22/09/2017	QTSE Sample No	291029	291030	291031	291032	291033

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025			< 0.001	< 0.001	< 0.001
pH	pH Units	N/a	MCERTS	7.0	6.9	7.0	7.5	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	24	12	18	19	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.02	0.01	0.02	0.02	
Organic Matter	%	< 0.1	MCERTS	0.9	0.9	5.2	2.3	
Arsenic (As)	mg/kg	< 2	MCERTS	6	6	7	16	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	0.2	0.3	
Chromium (Cr)	mg/kg	< 2	MCERTS	17	17	20	19	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	10	9	13	38	
Lead (Pb)	mg/kg	< 3	MCERTS	11	12	23	81	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	11	11	14	18	
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	
Zinc (Zn)	mg/kg	< 3	MCERTS	41	41	57	106	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate						
QTS Environmental Report No: 17-64372	Date Sampled	13/09/17	13/09/17	13/09/17	14/09/17	14/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	WS03	WS05	WS05	WS06	WS06
Project / Job Ref: BRD2934	Additional Refs	J1	J1	J3	J1	J3
Order No: None Supplied	Depth (m)	0.10	0.10	0.50	0.10	0.90
Reporting Date: 22/09/2017	QTSE Sample No	291034	291035	291036	291037	291038

Determinand	Unit	RL	Accreditation					
Asbestos Quantification (S)	%	< 0.001	ISO17025		< 0.001	< 0.001		
pH	pH Units	N/a	MCERTS	6.4		7.1	6.9	8.1
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	10		< 10	< 10	< 10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.01		< 0.01	< 0.01	< 0.01
Organic Matter	%	< 0.1	MCERTS	2.2		0.7	2.2	0.4
Arsenic (As)	mg/kg	< 2	MCERTS	7		10	11	7
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.2		< 0.2	0.3	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	16		24	18	19
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	11		14	14	10
Lead (Pb)	mg/kg	< 3	MCERTS	23		13	26	10
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	10		20	13	17
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	42		49	50	40

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17	11/09/17	11/09/17	11/09/17	11/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP01	TP02	TP04	TP07	TP08
Project / Job Ref: BRD2934	Additional Refs	J1	J2	J1	J1	J1
Order No: None Supplied	Depth (m)	0.10	1.00	0.10	0.50	0.20
Reporting Date: 22/09/2017	QTSE Sample No	291019	291020	291021	291022	291023

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17	12/09/17	12/09/17	12/09/17	12/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP09	TP11	TP12	TP14	TP16
Project / Job Ref: BRD2934	Additional Refs	J2	J1	J1	J1	J2
Order No: None Supplied	Depth (m)	0.50	0.10	0.10	0.10	0.60
Reporting Date: 22/09/2017	QTSE Sample No	291024	291025	291026	291027	291028

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-64372	Date Sampled	12/09/17	12/09/17	13/09/17	13/09/17	13/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP17	TP18	WS01	WS02	WS03
Project / Job Ref: BRD2934	Additional Refs	J1	J1	J1	J1	J1
Order No: None Supplied	Depth (m)	0.20	0.10	0.10	0.10	0.10
Reporting Date: 22/09/2017	QTSE Sample No	291029	291030	291031	291032	291034

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.16	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.18	0.46	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.15	0.39	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.23	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.27	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.32	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.12	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.20	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.11	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.14	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	2.4	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-64372	Date Sampled	13/09/17	14/09/17	14/09/17		
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Drove Lane, Yapton	TP / BH No	WS05	WS06	WS06		
Project / Job Ref: BRD2934	Additional Refs	J3	J1	J3		
Order No: None Supplied	Depth (m)	0.50	0.10	0.90		
Reporting Date: 22/09/2017	QTSE Sample No	291036	291037	291038		

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.34	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.29	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.15	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

Soil Analysis Certificate - TPH LQM Banded						
QTS Environmental Report No: 17-64372	Date Sampled	12/09/17	13/09/17	14/09/17		
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Drove Lane, Yapton	TP / BH No	TP16	WS05	WS06		
Project / Job Ref: BRD2934	Additional Refs	J2	J3	J3		
Order No: None Supplied	Depth (m)	0.60	0.50	0.90		
Reporting Date: 22/09/2017	QTSE Sample No	291028	291036	291038		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C16 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10		
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30		
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10	< 10		
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30	< 30		
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60	< 60		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

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

[redacted]

4480

Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 17-64372	Date Sampled	12/09/17	13/09/17	14/09/17		
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Drove Lane, Yapton	TP / BH No	TP16	WS05	WS06		
Project / Job Ref: BRD2934	Additional Refs	J2	J3	J3		
Order No: None Supplied	Depth (m)	0.60	0.50	0.90		
Reporting Date: 22/09/2017	QTSE Sample No	291028	291036	291038		

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Soil Analysis Certificate - Semi Volatile Organic Compo						
QTS Environmental Report No: 17-64372	Date Sampled	12/09/17	14/09/17			
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Drove Lane, Yapton	TP / BH No	TP16	WS06			
Project / Job Ref: BRD2934	Additional Refs	J2	J3			
Order No: None Supplied	Depth (m)	0.60	0.90			
Reporting Date: 22/09/2017	QTSE Sample No	291028	291038			

Determinand	Unit	RL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15			
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
4-Chloroanaline	mg/kg	< 0.15	NONE	< 0.15	< 0.15			
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

Soil Analysis Certificate - Organochlorine Pesticides						
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17	12/09/17	12/09/17	12/09/17	
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Drove Lane, Yapton	TP / BH No	TP01	TP12	TP14	TP18	
Project / Job Ref: BRD2934	Additional Refs	J1	J1	J1	J1	
Order No: None Supplied	Depth (m)	0.10	0.10	0.10	0.10	
Reporting Date: 22/09/2017	QTSE Sample No	291019	291026	291027	291030	

Determinand	Unit	RL	Accreditation					
Aldrin	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
alpha-HCH	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
beta-HCH	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
cis-chlordane	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
delta-HCH	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Dieldrin	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Endosulfan A	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Endosulfan B	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Endrin	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
gamma-HCH (Lindane)	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Heptachlor	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Heptachlor epoxide	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Hexachlorobenzene (HCB)	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Isodrin	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Methoxychlor	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
o,p' - DDD	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
o,p' - DDE	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
o,p' - DDT	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
p,p' - DDD	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
p,p' - DDE	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
p,p' - DDT	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
trans-chlordane	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Trifluralin	mg/kg	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

				Landfill Waste Acceptance Criteria Limits		
QTS Environmental Report No: 17-64372	Date Sampled	11/09/17		Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
BRD Environmental Ltd	Time Sampled	None Supplied				
Site Reference: Drove Lane, Yapton	TP / BH No	TP02				
Project / Job Ref: BRD2934	Additional Refs	J2				
Order No: None Supplied	Depth (m)	1.00				
Reporting Date: 22/09/2017	QTSE Sample No	291020				

Determinand	Unit	MDL				
TOC[MU]	%	< 0.1	1	3%	5%	6%
Loss on Ignition	%	< 0.01	3.10	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10	500	--	--
Total PAH[MU]	mg/kg	< 1.7	< 1.7	100	--	--
pH[MU]	pH Units	N/a	6.4	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1	--	To be evaluated	To be evaluated

Eluate Analysis	2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic[U]	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium[U]	< 0.02	< 0.02		< 0.1	20	100	300
Cadmium[U]	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium[U]	< 0.005	< 0.005		< 0.20	0.5	10	70
Copper[U]	< 0.01	< 0.01		< 0.5	2	50	100
Mercury[U]	< 0.005	< 0.005		< 0.01	0.01	0.2	2
Molybdenum[U]	< 0.001	< 0.001		< 0.1	0.5	10	30
Nickel[U]	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead[U]	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony[U]	< 0.005	< 0.005		< 0.06	0.06	0.7	5
Selenium[U]	< 0.005	< 0.005		< 0.1	0.1	0.5	7
Zinc[U]	0.018	< 0.005		< 0.2	4	50	200
Chloride[U]	13	2		28	800	15000	25000
Fluoride[U]	0.7	0.8		7.9	10	150	500
Sulphate[U]	3	< 1		< 20	1000	20000	50000
TDS	52	16		188	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	15.5	7.1		77.2	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.20						
Dry Matter (%)	86						
Moisture (%)	16.4						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 17-64372	
BRD Environmental Ltd	
Site Reference: Drove Lane, Yapton	
Project / Job Ref: BRD2934	
Order No: None Supplied	
Reporting Date: 22/09/2017	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
291019	TP01	J1	0.10	15	Brown sandy clay
291020	TP02	J2	1.00	14	Brown sandy clay
291021	TP04	J1	0.10	13.4	Brown sandy clay
291022	TP07	J1	0.50	7.5	Light brown sandy clay
291023	TP08	J1	0.20	13.3	Brown sandy clay
291024	TP09	J2	0.50	14.7	Brown sandy clay
291025	TP11	J1	0.10	14.7	Brown sandy clay with vegetation
291026	TP12	J1	0.10	14.5	Brown sandy clay
291027	TP14	J1	0.10	12.1	Brown sandy clay
291028	TP16	J2	0.60	13.4	Brown sandy clay
291029	TP17	J1	0.20	12.3	Brown sandy clay
291030	TP18	J1	0.10	14.5	Brown sandy clay
291031	WS01	J1	0.10	21	Brown sandy clay with vegetation
291032	WS02	J1	0.10	11.3	Brown sandy clay with stones and brick
291034	WS03	J1	0.10	19	Brown sandy clay with brick
291036	WS05	J3	0.50	9.4	Brown sandy clay
291037	WS06	J1	0.10	7.9	Brown sandy clay with vegetation
291038	WS06	J3	0.90	9.2	Brown sandy clay with stones

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

Insufficient Sample I/S

Unsuitable Sample U/S

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

[redacted]

4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-64372
BRD Environmental Ltd
Site Reference: Drove Lane, Yapton
Project / Job Ref: BRD2934
Order No: None Supplied
Reporting Date: 22/09/2017

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

D Dried
AR As Received

Andy Plant
BRD Environmental Ltd
Hawthorne Villa
1 Old Parr Road
Banbury
Oxfordshire
OX16 5HT

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
[redacted]

QTS Environmental Report No: 17-64373

Site Reference:	Drove Lane, Yapton
Project / Job Ref:	BRD2934
Order No:	None Supplied
Sample Receipt Date:	18/09/2017
Sample Scheduled Date:	18/09/2017
Report Issue Number:	1
Reporting Date:	22/09/2017

Authorised by:
[redacted]
Kevin Old
Associate Director of Laboratory

Authorised by:
[redacted]
Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645

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

4480

[redacted]

Soil Analysis Certificate						
QTS Environmental Report No: 17-64373	Date Sampled	14/09/17	14/09/17	11/09/17	11/09/17	12/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	WS07	WS10	TP02	TP04	TP11
Project / Job Ref: BRD2934	Additional Refs	J3	J3	D2	D1	D1
Order No: None Supplied	Depth (m)	0.90	0.80	1.50	1.00	1.00
Reporting Date: 22/09/2017	QTSE Sample No	291039	291040	291041	291042	291043

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.7	6.6	7.6	7.6	7.7
Total Sulphate as SO_4	mg/kg	< 200	NONE			< 200	< 200	< 200
Total Sulphate as SO_4	%	< 0.02	NONE			< 0.02	< 0.02	< 0.02
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	11	< 10	< 10	< 10	< 10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Sulphur	%	< 0.02	NONE			< 0.02	< 0.02	< 0.02
Organic Matter	%	< 0.1	MCERTS	0.6	0.6			
Arsenic (As)	mg/kg	< 2	MCERTS	10	4			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	26	9			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	14	6			
Lead (Pb)	mg/kg	< 3	MCERTS	13	12			
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	19	7			
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3			
Zinc (Zn)	mg/kg	< 3	MCERTS	50	23			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

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

[redacted]

Soil Analysis Certificate						
QTS Environmental Report No: 17-64373	Date Sampled	12/09/17	12/09/17	12/09/17	12/09/17	13/09/17
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Drove Lane, Yapton	TP / BH No	TP13	TP15	TP16	TP17	WS05
Project / Job Ref: BRD2934	Additional Refs	D3	D1	D3	D3	J2
Order No: None Supplied	Depth (m)	3.00	1.00	2.50	2.50	0.30
Reporting Date: 22/09/2017	QTSE Sample No	291044	291045	291046	291047	291048

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	8.2	7.5	8.0	8.1	7.2
Total Sulphate as SO_4	mg/kg	< 200	NONE	277	< 200	< 200	< 200	212
Total Sulphate as SO_4	%	< 0.02	NONE	0.03	< 0.02	< 0.02	< 0.02	0.02
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	18	< 10	< 10	< 10	< 10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Organic Matter	%	< 0.1	MCERTS					
Arsenic (As)	mg/kg	< 2	MCERTS					
Cadmium (Cd)	mg/kg	< 0.2	MCERTS					
Chromium (Cr)	mg/kg	< 2	MCERTS					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu)	mg/kg	< 4	MCERTS					
Lead (Pb)	mg/kg	< 3	MCERTS					
Mercury (Hg)	mg/kg	< 1	NONE					
Nickel (Ni)	mg/kg	< 3	MCERTS					
Selenium (Se)	mg/kg	< 3	NONE					
Zinc (Zn)	mg/kg	< 3	MCERTS					

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C
Subcontracted analysis (S)

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

[redacted]

4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-64373	Date Sampled	14/09/17	14/09/17			
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Drove Lane, Yapton	TP / BH No	WS07	WS10			
Project / Job Ref: BRD2934	Additional Refs	J3	J3			
Order No: None Supplied	Depth (m)	0.90	0.80			
Reporting Date: 22/09/2017	QTSE Sample No	291039	291040			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - TPH LQM Banded						
QTS Environmental Report No: 17-64373	Date Sampled	14/09/17	14/09/17			
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Drove Lane, Yapton	TP / BH No	WS07	WS10			
Project / Job Ref: BRD2934	Additional Refs	J3	J3			
Order No: None Supplied	Depth (m)	0.90	0.80			
Reporting Date: 22/09/2017	QTSE Sample No	291039	291040			

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3			
Aliphatic >C16 - C35	mg/kg	< 10	MCERTS	< 10	< 10			
Aliphatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10			
Aliphatic (C5 - C44)	mg/kg	< 30	NONE	< 30	< 30			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2			
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3			
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10			
Aromatic >C35 - C44	mg/kg	< 10	NONE	< 10	< 10			
Aromatic (>C5 - C44)	mg/kg	< 30	NONE	< 30	< 30			
Total >C5 - C44	mg/kg	< 60	NONE	< 60	< 60			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 17-64373	Date Sampled	14/09/17	14/09/17			
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Drove Lane, Yapton	TP / BH No	WS07	WS10			
Project / Job Ref: BRD2934	Additional Refs	J3	J3			
Order No: None Supplied	Depth (m)	0.90	0.80			
Reporting Date: 22/09/2017	QTSE Sample No	291039	291040			

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2			
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2			
MTBE	ug/kg	< 5	MCERTS	< 5	< 5			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

ARUN DISTRICT COUNCIL Y/153/21/DOC

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

[redacted]

4480

Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
QTS Environmental Report No: 17-64373	Date Sampled	14/09/17	14/09/17			
BRD Environmental Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Drove Lane, Yapton	TP / BH No	WS07	WS10			
Project / Job Ref: BRD2934	Additional Refs	J3	J3			
Order No: None Supplied	Depth (m)	0.90	0.80			
Reporting Date: 22/09/2017	QTSE Sample No	291039	291040			

Determinand	Unit	RL	Accreditation					
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15			
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
p-Cresol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
4-Chloroanaline	mg/kg	< 0.15	NONE	< 0.15	< 0.15			
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dibenzofuran	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
Carbazole	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1			
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15			
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 17-64373	
BRD Environmental Ltd	
Site Reference: Drove Lane, Yapton	
Project / Job Ref: BRD2934	
Order No: None Supplied	
Reporting Date: 22/09/2017	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
291039	WS07	J3	0.90	11.2	Brown sandy clay
291040	WS10	J3	0.80	5.2	Brown sandy clay with stones
291041	TP02	D2	1.50	13.3	Brown sandy clay
291042	TP04	D1	1.00	8.9	Brown sandy clay with stones
291043	TP11	D1	1.00	13.3	Brown sandy clay
291044	TP13	D3	3.00	13.5	Light grey sandy clay with chalk
291045	TP15	D1	1.00	10.9	Brown sandy clay
291046	TP16	D3	2.50	10.9	Brown sandy clay with stones
291047	TP17	D3	2.50	13.6	Brown sandy clay
291048	WS05	J2	0.30	7.6	Brown sandy clay

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

Insufficient Sample I/S

Unsuitable Sample U/S

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
[redacted]

4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-64373
BRD Environmental Ltd
Site Reference: Drove Lane, Yapton
Project / Job Ref: BRD2934
Order No: None Supplied
Reporting Date: 22/09/2017

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

D Dried
AR As Received

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

0998

Contract	**Drove Lane, Yapton**
Serial No.	**S31804**

Client:

BRD Environmental Ltd

BRD Environmental Ltd
Hawthorne Villa
1 Old Parr Road
Banbury
Oxfordshire
OX16 5HT

Soil Property Testing Ltd

15, 16, 18 Halcyon Court, St Margaret's Way,
Stukeley Meadows, Huntingdon,
Cambridgeshire, PE29 6DG

[redacted]

Samples Submitted By:

BRD Environmental Ltd

Samples Labelled:

Drove Lane, Yapton

Approved Signatories:

- ☑ **J.C. Garner B.Eng (Hons) FGS** Technical Director
- ☐ **S.P. Townend FGS** Quality Manager
- ☐ **W. Johnstone** Materials Lab Manager
- ☐ **D. Sabnis** Operations Manager

[redacted]

Date Received: 18/09/2017

Samples Tested Between: 18/09/2017 **and** 03/10/2017

Remarks:

For the attention of Mr A Plant
Your reference: BRD2934

Notes:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.

2. (a) UKAS - United Kingdom Accreditation Service
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.

4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

ARUN DISTRICT COUNCIL Y/153/21/DOC

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

0998

Contract	**Drove Lane, Yapton**		
Serial No.	**S31804**	**Target Date**	02/10/2017
Scheduled By	BRD Environmental Ltd		

SCHEDULE OF LABORATORY TESTS

Schedule Remarks

Bore Hole No.	Type	Sample Ref.	Top Depth	Liquid/Plastic Limits	Wet Sieve Preparation	Water Content BSEN	PSD by Wet Sieve & Hydro	PSD by Hydro													Sample Remarks
TP02	D	3	2.00	1	1	1															
TP04	D	1	1.00	1	1	1															
TP05	D	2	1.70	1		1															
TP06	D	1	1.00	1		1															
TP06	D	2	2.10	1		1															
TP08	D	3	3.00	1	1	1															
TP10	D	1	1.00	1		1															
TP11	B	1	2.10				1														
TP13	D	2	2.00	1		1															
TP18	B	1	2.95				1														
WS07	D	2	2.50					1													
WS10	D	3	2.50				1														
Totals				**8**	**3**	**8**	**3**	**1**													**End of Schedule**

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

0998

Contract	Drove Lane, Yapton
Serial No.	S31804

SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti-city Index (%)	Liquid-ity Index (%)	SAMPLE PREPARATION				Description	CLASS
									Method	Ret'd 0.425mm (%)	Corr'd W/C <0.425mm	Curing Time (hrs)		
TP02	2.00	D	3	16.2	23	16	7	0.03	Wet Sieved	12 (M)	18.4*	24	Yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium flint.	CL
TP04	1.00	D	1	18.6	31	15	16	0.22	Wet Sieved	13 (M)	21.4*	28	Firm dark yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium chalk and rare flint.	CL
TP05	1.70	D	2	21.2	38	19	19	0.12	From Natural	0 (A)		24	Firm yellowish brown silty CLAY with pale brown mottling.	CI
TP06	1.00	D	1	21.1	41	20	21	0.05	From Natural	0 (A)		24	Stiff friable dark yellowish brown silty CLAY with rare recently active roots.	CI
TP06	2.10	D	2	23.8	35	19	16	0.30	From Natural	0 (A)		24	Soft pale brown silty CLAY with occasional brownish yellow mottling and rare decayed roots.	CL/CI
TP08	3.00	D	3	15.0	24	14	10	0.10	Wet Sieved	25 (M)	20.0*	24	Brownish yellow slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium chalk and rare fine to coarse flint.	CL
TP10	1.00	D	1	16.8	44	20	24	-0.13	From Natural	0 (A)		24	Very stiff friable yellowish brown silty CLAY with rare recently active roots.	CI
TP13	2.00	D	2	18.5	31	18	13	0.04	From Natural	0 (A)		24	Stiff brownish yellow silty CLAY with occasional recently active and decayed roots.	CL

Method Of Preparation: BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377:Part 2:1990:3.2, 4.4

Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

Comments: *Corrected water content assume material greater than 0.425mm is non-porous. See BS1377: Part 2: 1990: Clause 3 Note 1

Remarks to Include: Sample disturbance, loss of water, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

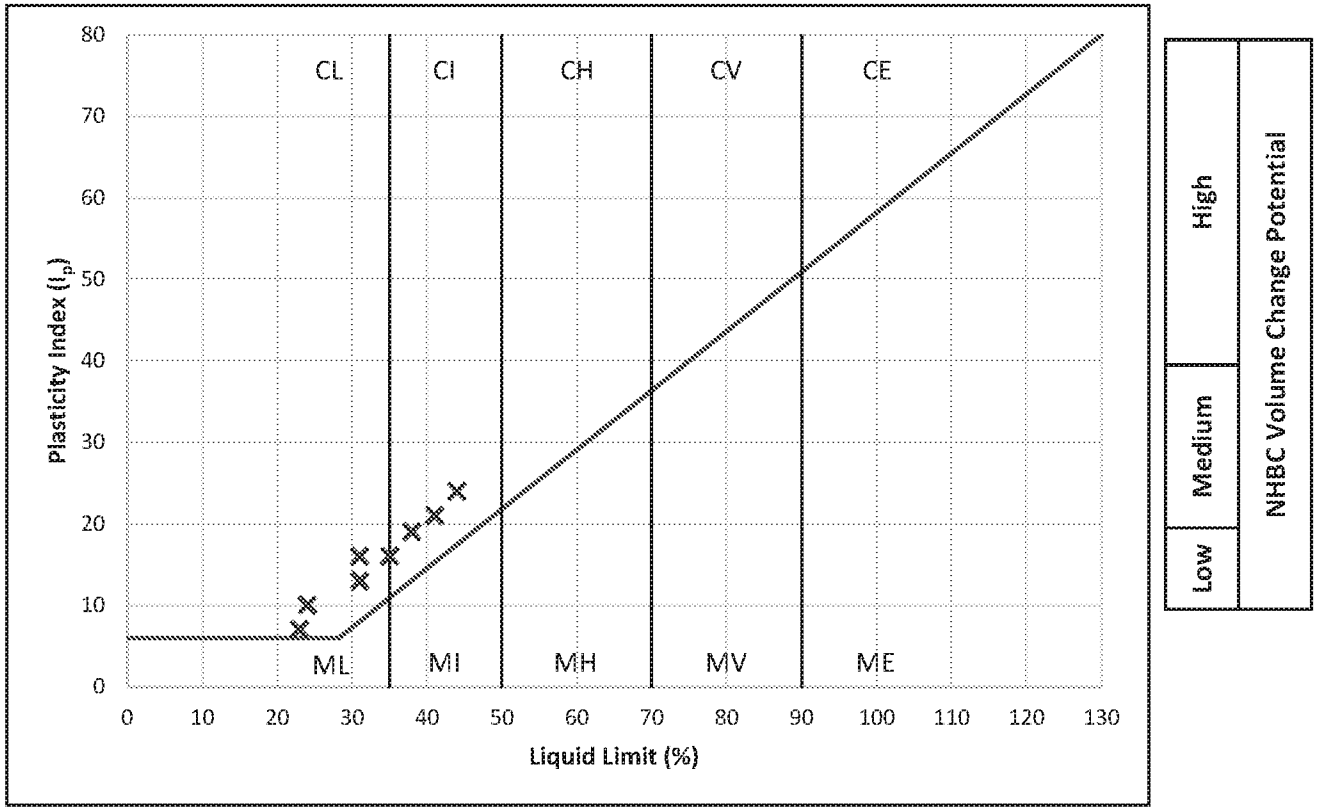
DATE ISSUED: 03/10/2017

0998

Contract	Drove Lane, Yapton
Serial No.	S31804

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART

Plasticity				
Low	Medium	High	Very High	Extremely High



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: Part 2: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

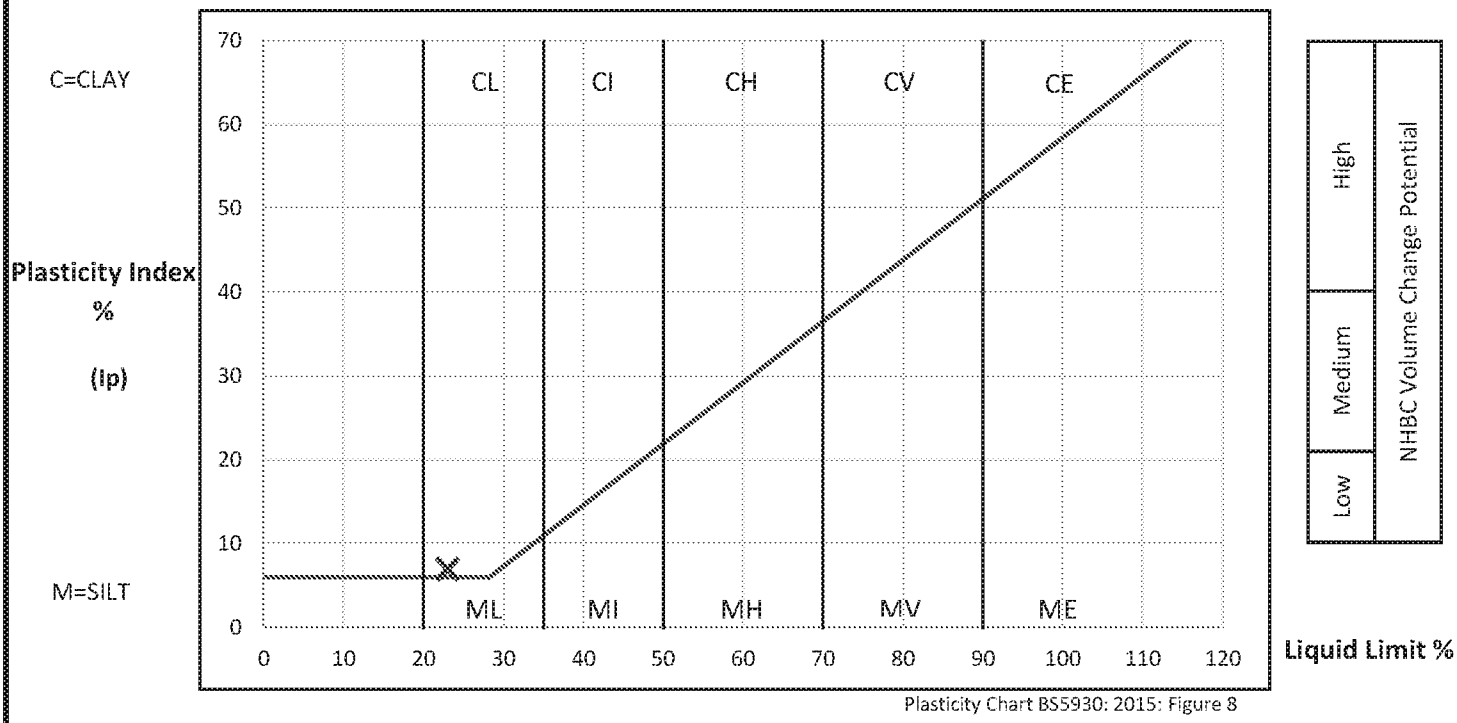
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP02	2.00	D	3	16.2	Yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium flint.	

PREPARATION			Liquid Limit	23 %
Method of preparation	Wet sieved over 0.425mm sieve		Plastic Limit	16 %
Sample retained 0.425mm sieve	(Measured)	12 %	Plasticity Index	7 %
Corrected water content for material passing 0.425mm		18.4 %	Liquidity Index	0.03
Sample retained 2mm sieve	(Measured)	6 %	NHBC Modified (I'p)	6 %
Curing time	24 hrs	Clay Content: Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

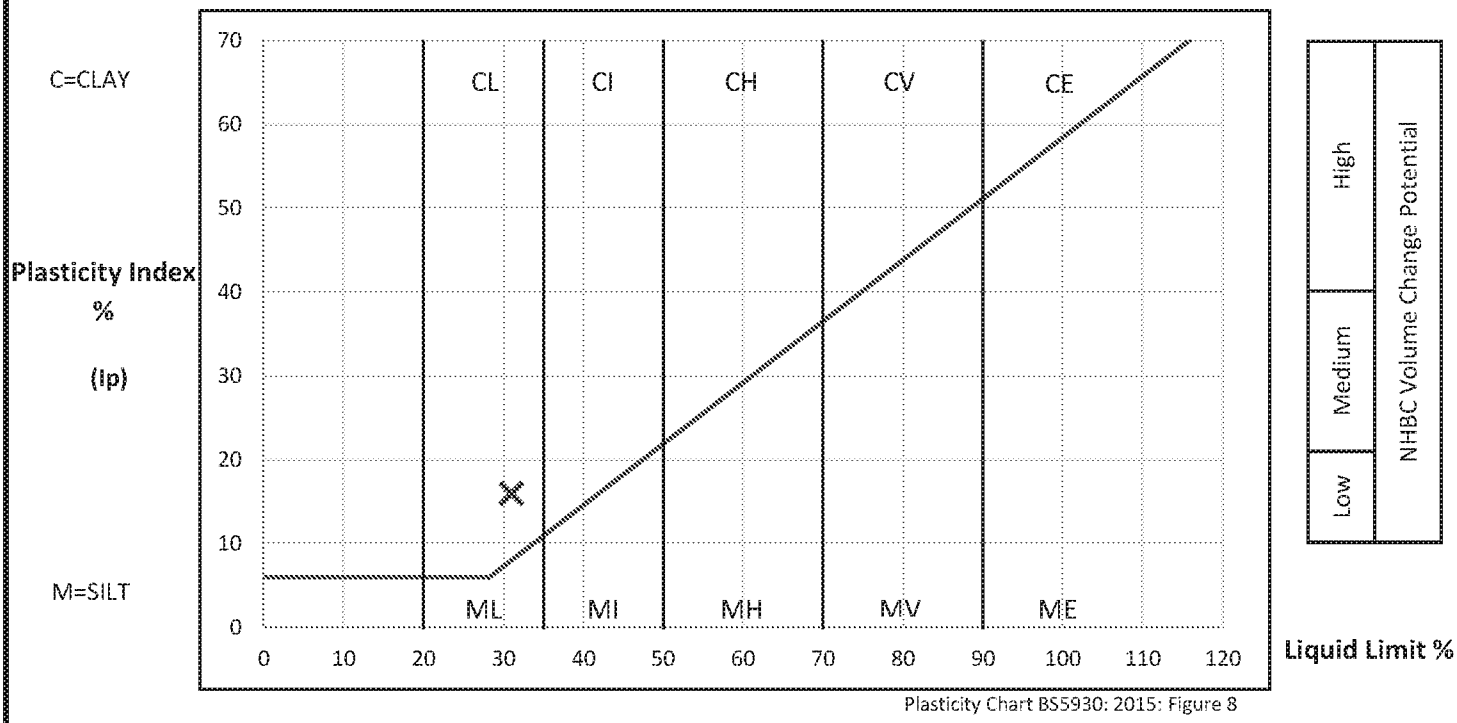
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP04	1.00	D	1	18.6	Firm dark yellowish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium chalk and rare flint.	1 x marly chalk lump present but not used for test.

PREPARATION				Liquid Limit	31 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	15 %
Sample retained 0.425mm sieve	(Measured)	13 %		Plasticity Index	16 %
Corrected water content for material passing 0.425mm		21.4 %		Liquidity Index	0.22
Sample retained 2mm sieve	(Measured)	11 %		NHBC Modified (I'p)	14 %
Curing time	28 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

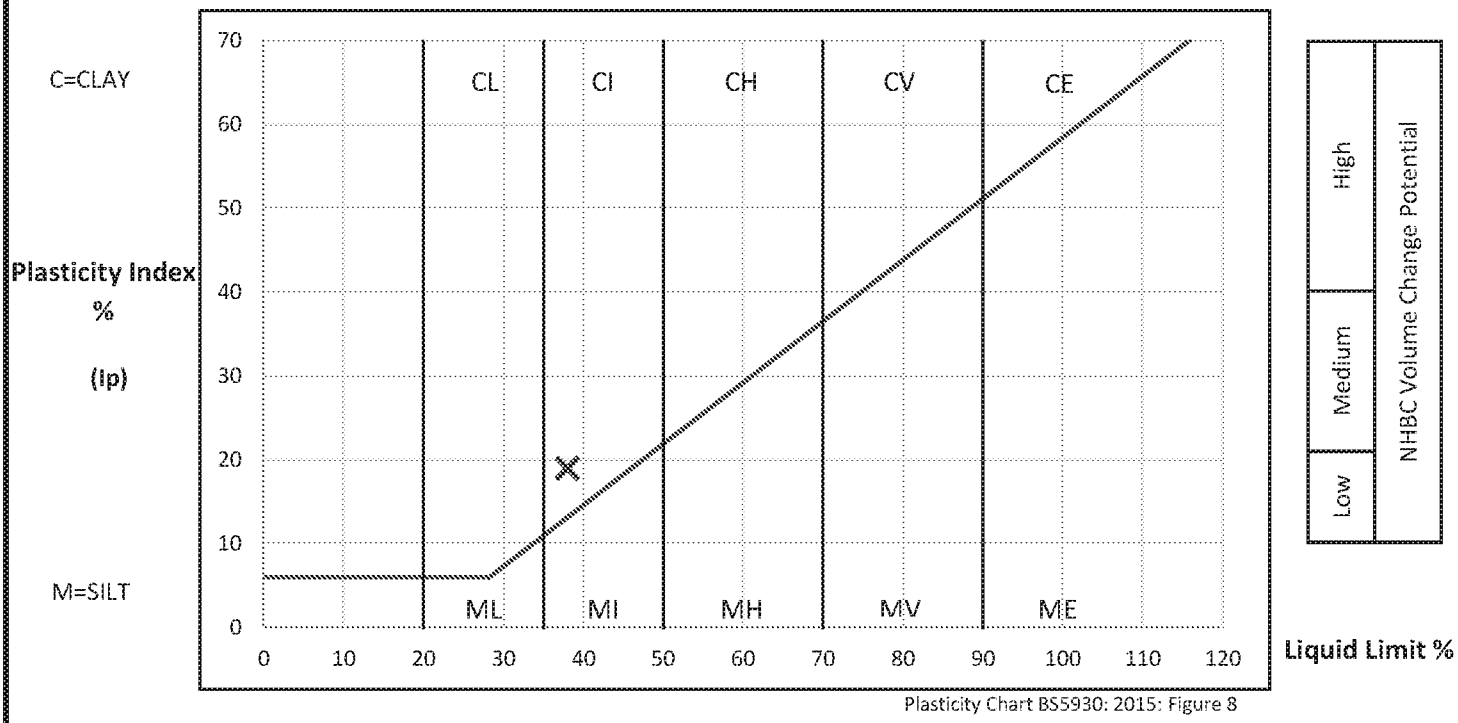
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP05	1.70	D	2	21.2	Firm yellowish brown silty CLAY with pale brown mottling.	

PREPARATION			Liquid Limit	38 %
Method of preparation		From natural	Plastic Limit	19 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	19 %
Corrected water content for material passing 0.425mm			Liquidity Index	0.12
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

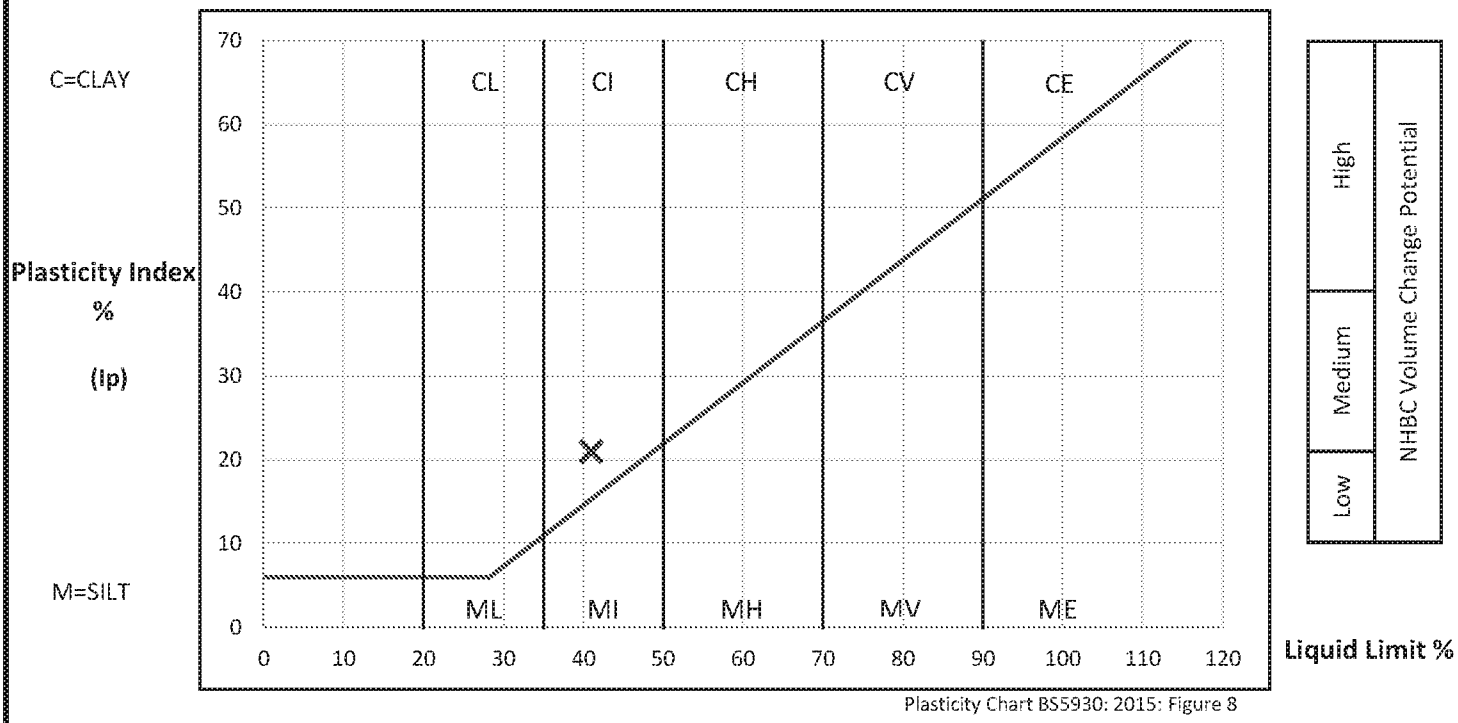
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP06	1.00	D	1	21.1	Stiff friable dark yellowish brown silty CLAY with rare recently active roots.	

PREPARATION			Liquid Limit	41 %
Method of preparation		From natural	Plastic Limit	20 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	21 %
Corrected water content for material passing 0.425mm			Liquidity Index	0.05
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

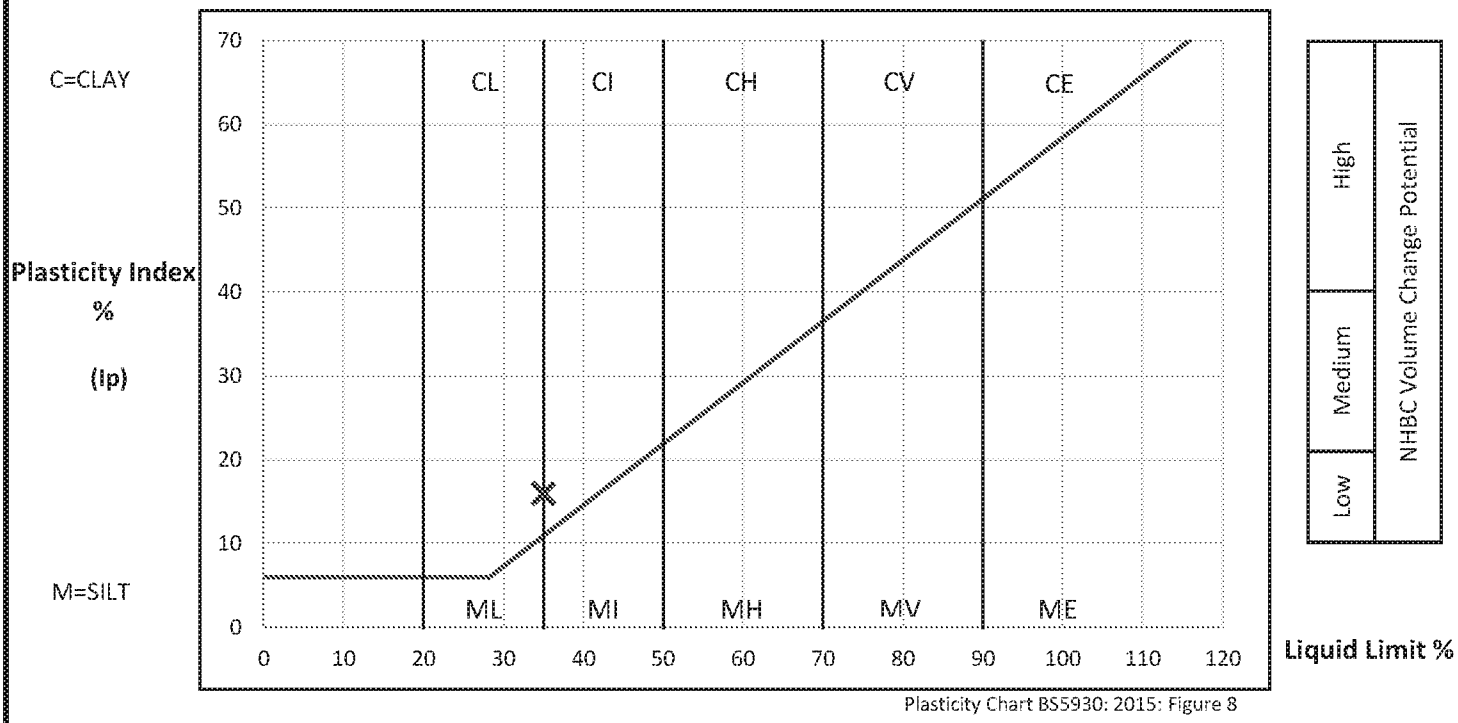
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP06	2.10	D	2	23.8	Soft pale brown silty CLAY with occasional brownish yellow mottling and rare decayed roots.	

PREPARATION			Liquid Limit	35 %
Method of preparation		From natural	Plastic Limit	19 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	16 %
Corrected water content for material passing 0.425mm			Liquidity Index	0.30
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content: Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

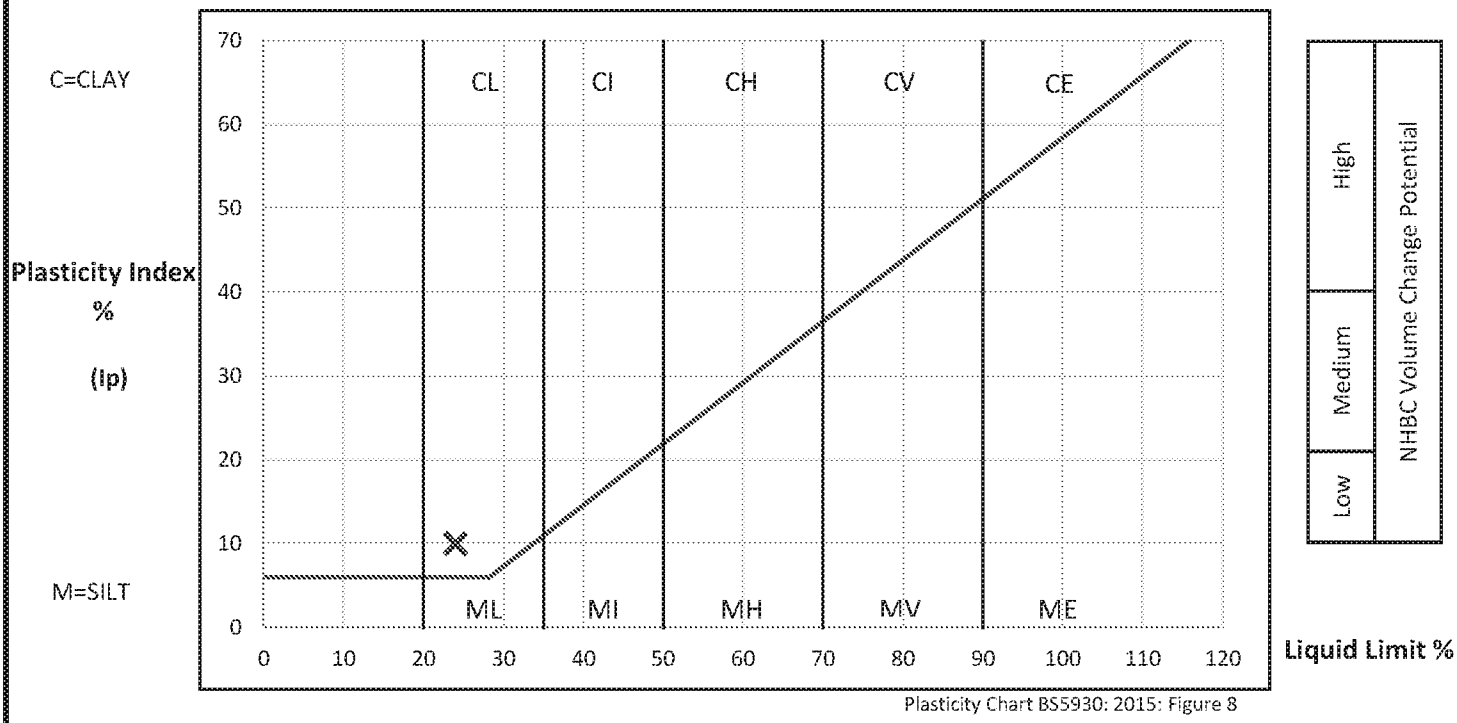
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP08	3.00	D	3	15.0	Brownish yellow slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium chalk and rare fine to coarse flint.	

PREPARATION				Liquid Limit	24 %
Method of preparation	Wet sieved over 0.425mm sieve			Plastic Limit	14 %
Sample retained 0.425mm sieve	(Measured)	25 %		Plasticity Index	10 %
Corrected water content for material passing 0.425mm		20.0 %		Liquidity Index	0.10
Sample retained 2mm sieve	(Measured)	23 %		NHBC Modified (I'p)	8 %
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	Corrected water content assume material greater than 0.425mm non-porous. See BS1377: Part2: 1990 Clause 3 Note 1 Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index Note: Modified Plasticity Index I'p = Ip x (% less than 425microns/100)

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

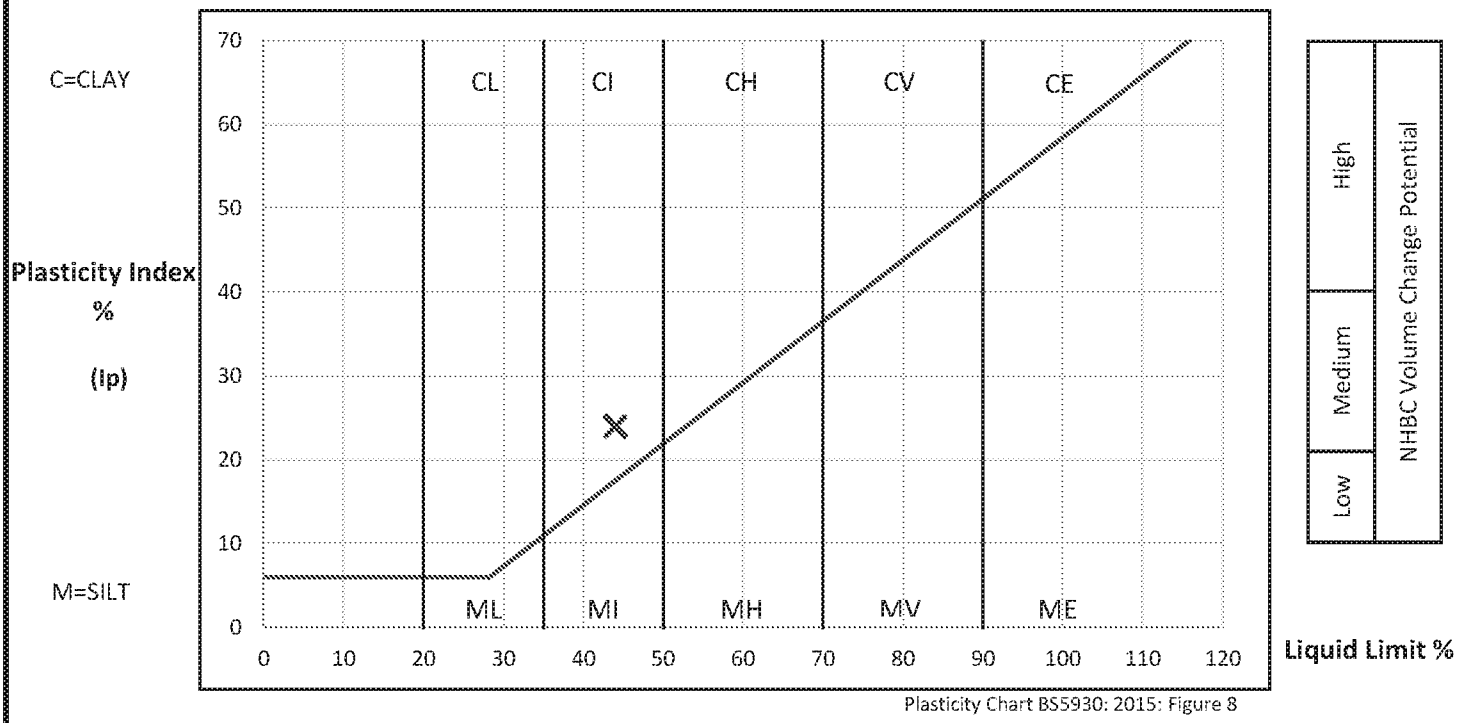
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP10	1.00	D	1	16.8	Friable yellowish brown silty CLAY with rare recently active roots.	

PREPARATION			Liquid Limit	44 %
Method of preparation		From natural	Plastic Limit	20 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	24 %
Corrected water content for material passing 0.425mm			Liquidity Index	-0.13
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

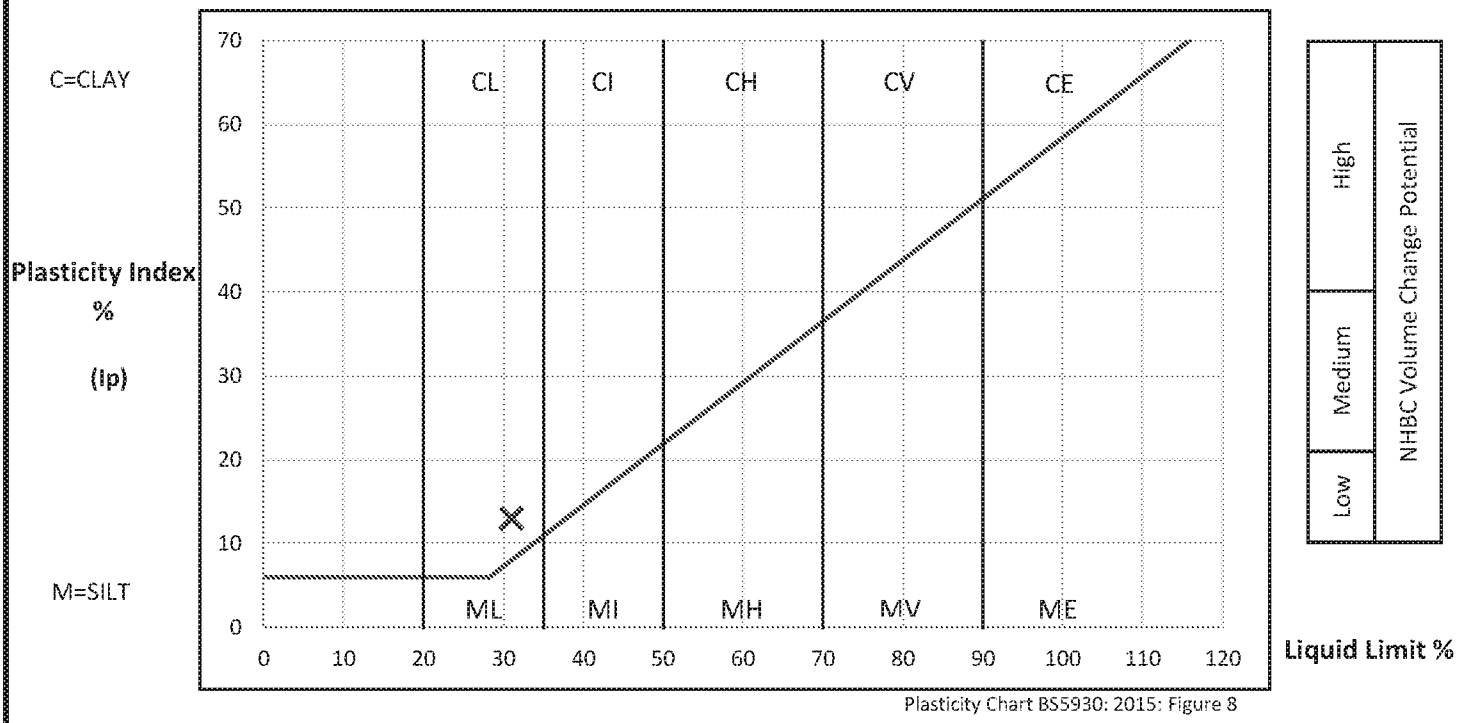
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF WATER CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP13	2.00	D	2	18.5	Stiff brownish yellow silty CLAY with occasional recently active and decayed roots.	

PREPARATION			Liquid Limit	31 %
Method of preparation		From natural	Plastic Limit	18 %
Sample retained 0.425mm sieve	(Assumed)	0 %	Plasticity Index	13 %
Corrected water content for material passing 0.425mm			Liquidity Index	0.04
Sample retained 2mm sieve	(Assumed)	0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content: Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation: BS EN ISO: 17892-1: 2014 & BS 1337: Part 2: 1990: 4.2

Method of Test: BS EN ISO: 17892-1: 2014 & BS1377: PART 2: 1990: 3.2, 4.4, 5.3, 5.4

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

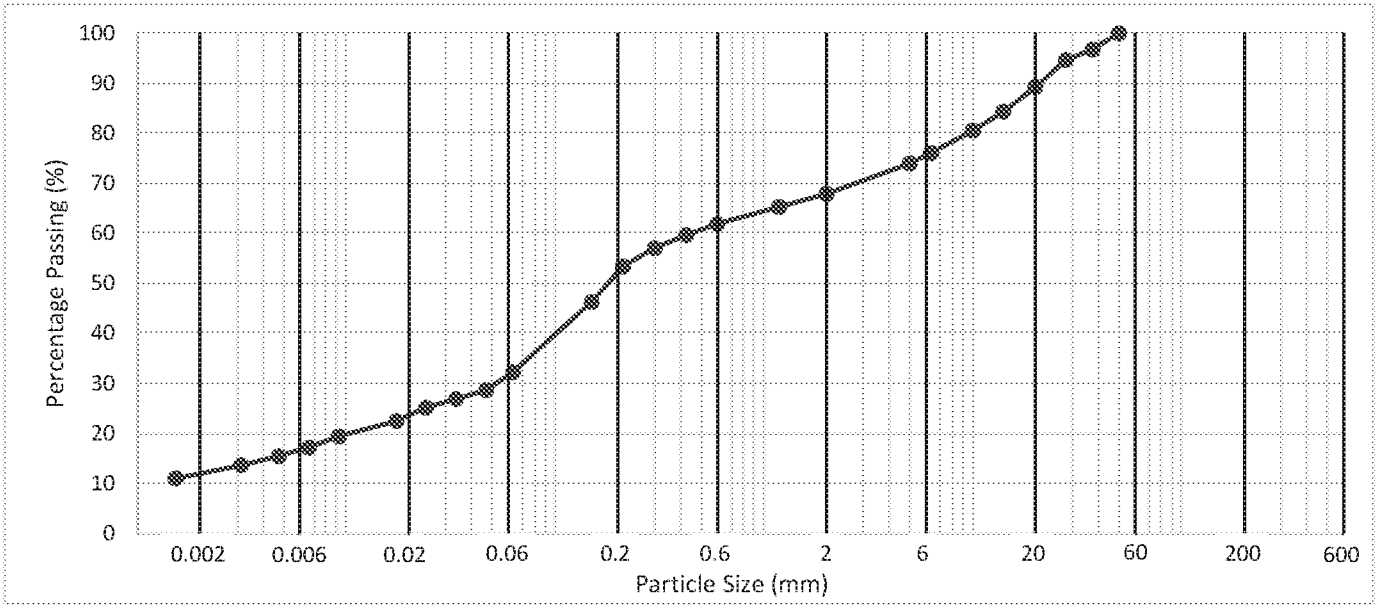
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
TP11	2.10	B	1	Yellowish brown clayey silty very gravelly calcareous SAND. Gravel is black, brown and white angular flint and white subangular chalk.	

Method of Test:	Wet Sieve + Hydrometer	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Course	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer

Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
0.0469	29	20
0.0337	27	
0.0241	25	
0.0174	23	Clay by Dry Mass (%)
0.0092	19	
0.0066	17	
0.0047	15	12
0.0031	14	
0.0015	11	

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	68	36
1.18	65	
0.600	62	
0.425	60	
0.300	57	
0.212	53	
0.150	46	
0.063	32	

Fines By Dry Mass (%)	
<0.063mm	32

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		32
125		
90		
63		
50	100	
37.5	97	
28	95	
20	89	
14	84	
10	81	
6.3	76	
5	74	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5

Method of test: BS1377: Part2: 1990: 9.2, 9.5

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

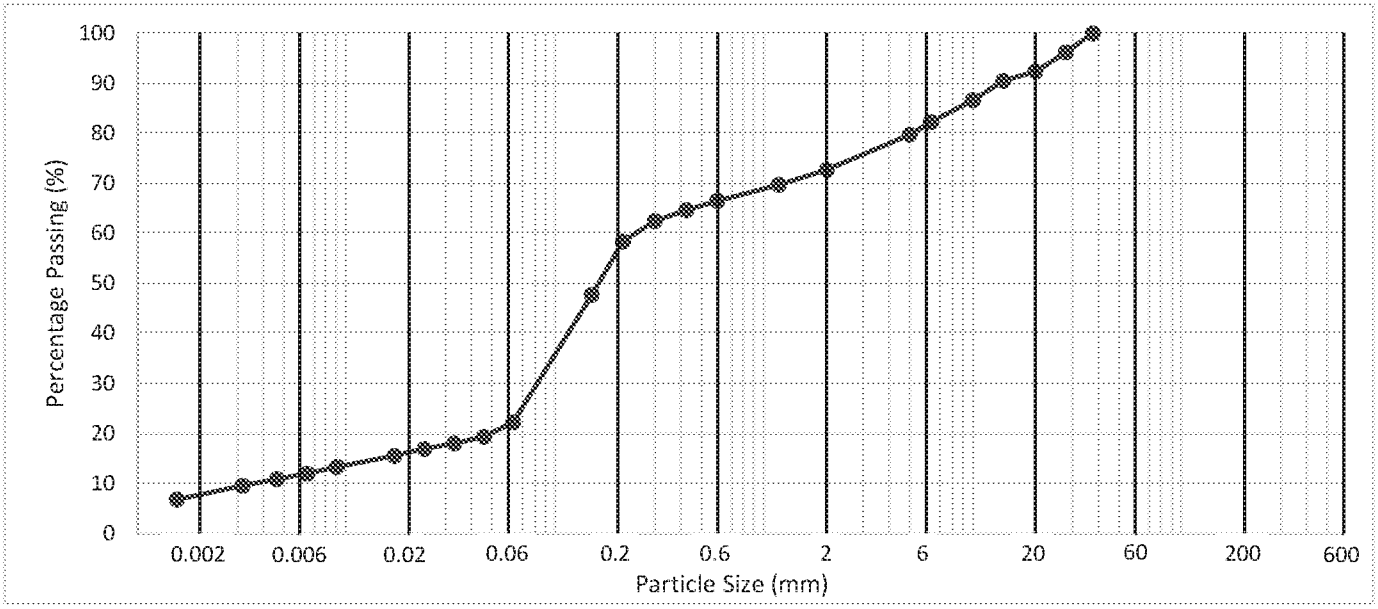
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
TP18	2.95	B	1	Yellowish brown clayey silty very gravelly calcareous SAND. Gravel is black, white and brown angular flint and white subangular chalk.	

Method of Test:	Wet Sieve + Hydrometer	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Course	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
	0.0457	19	15
	0.0329	18	
	0.0236	17	
	0.0170	16	Clay by Dry Mass (%)
	0.0090	13	
	0.0065	12	
	0.0047	11	8
	0.0032	10	
	0.0015	7	

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	73	51
1.18	70	
0.600	67	
0.425	65	
0.300	63	
0.212	58	
0.150	48	
0.063	22	

Fines By Dry Mass (%)	
<0.063mm	22

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		27
125		
90		
63		
50		
37.5	100	
28	96	
20	92	
14	91	
10	87	
6.3	82	
5	80	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part2: 1990: 9.2, 9.5
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

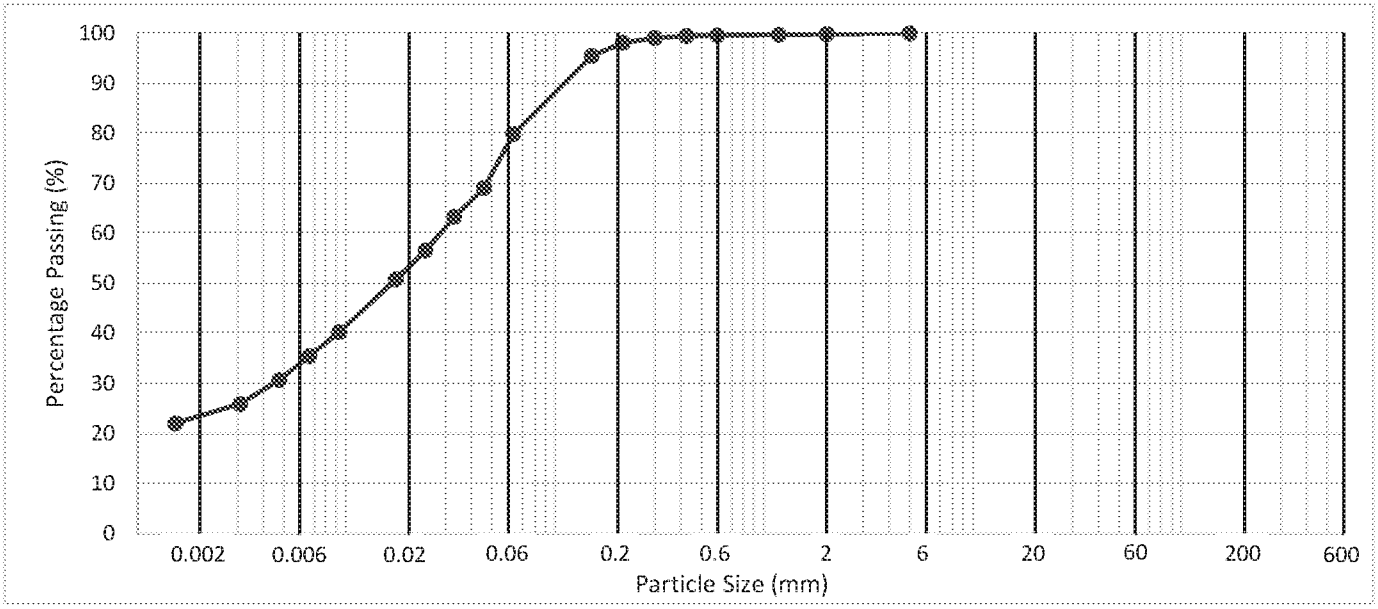
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
WS07	2.50	D	2	Soft light olive brown and yellowish brown slightly sandy silty CLAY with rare fine chalk gravel.	

Method of Test:	Hydrometer + Pre-sieve	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Course	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer

Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
0.0456	69	57
0.0330	63	
0.0240	57	
0.0173	51	Clay by Dry Mass (%)
0.0093	40	
0.0067	36	
0.0048	31	23
0.0031	26	
0.0015	22	

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	100	20
1.18	100	
0.600	100	
0.425	99	
0.300	99	
0.212	98	
0.150	96	
0.063	80	

Fines By Dry Mass (%)	
<0.063mm	80

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		0
125		
90		
63		
50		
37.5		
28		
20		
14		
10		
6.3		
5	100	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5
Method of test: BS1377: Part2: 1990: , 9.2, 9.5
Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 03/10/2017

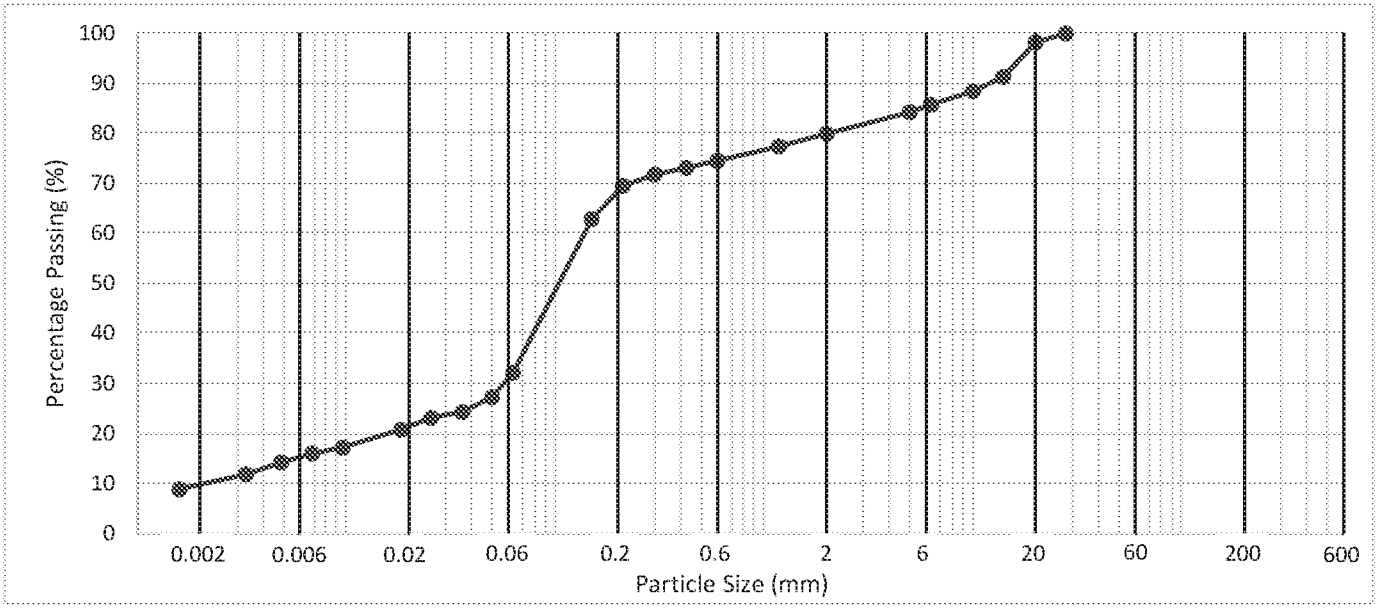
0998

Contract	Drove Lane, Yapton
Serial No.	S31804

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Pit No.	Depth (m)	Sample Type	Sample Reference	Description	Remarks
WS10	2.50	D	3	Yellowish brown clayey gravelly very silty calcareous SAND. Gravel is black, brown and white angular flint and occasional white subangular chalk.	

Method of Test:	Wet Sieve + Hydrometer	Method of Pretreatment:	Not Required



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Course	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Hydrometer	Particle Size (mm)	Passing (%)	Silt by Dry Mass (%)
	0.0500	27	23
	0.0360	24	
	0.0256	23	
	0.0183	21	Clay by Dry Mass (%)
	0.0096	17	
	0.0069	16	
	0.0049	14	10
	0.0033	12	
	0.0016	9	

Sieve Size (mm)	Passing (%)	Sand By Dry Mass (%)
2.00	80	48
1.18	77	
0.600	75	
0.425	73	
0.300	72	
0.212	70	
0.150	63	
0.063	32	

Fines By Dry Mass (%)	
<0.063mm	32

Sieve Size (mm)	Passing (%)	Gravel By Dry Mass (%)
150		20
125		
90		
63		
50		
37.5		
28	100	
20	98	
14	91	
10	88	
6.3	86	
5	84	

Method of Preparation: BS1377: Part 1: 2016: 8.3 & 8.4.5

Method of test: BS1377: Part2: 1990: 9.2, 9.5

Type of Sample Key: U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter

Comments:

APPENDIX C
CAMPBELL REITH 2019 REPORT



CampbellReith
consulting engineers

Land East of Drove Lane, Yapton

Interpretative Geotechnical Report

For

Trustees of the Langmead Pension Scheme

Project Number:

13024

August 2019

Campbell Reith Hill LLP
Raven House
29 Linkfield Lane
Redhill
Surrey
RH1 1SS

[redacted]

Document History and Status

Revision	Date	Purpose/Status	Author	Check	Review
D1	August 2019	Draft for comment	TET	JHC	JHC
F1	August 2019	Final for issue	TET	JHC	JHC

This document has been prepared in accordance with the scope of Campbell Reith Hill LLP's (CampbellReith) appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of CampbellReith's client. CampbellReith accepts no liability for any use of this document other than by its client and only for the purposes, stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of Campbell Reith Hill LLP. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

© Campbell Reith Hill LLP 2019

Document Details

Last saved	13/08/2019 16:35
Report Version	F1
File Name	13024-CRH-XX-XX-RP-GE-0001
Author	Tom Tavendale
Project Partner	David Smith
Project Number	13024
Project Name	Land East of Drove Lane, Yapton

ARUN DISTRICT COUNCIL Y/153/21/DOC

Contents

EXECUTIVE SUMMARY AND ACTIONS 1
1.0 INTRODUCTION 3
1.1. Appointment and Scope 3
1.2. Previous Investigations and Reports 3
2.0 SITE DESCRIPTION 4
2.1. Site Location 4
2.2. Site Layout 4
2.3. Site History 4
2.4. Unexploded Ordnance (UXO) 4
2.5. Tunnels and Infrastructure 5
2.6. Redevelopment Proposal 5
3.0 ENVIRONMENTAL SETTING 6
3.1. Geology 6
3.2. Preliminary Chalk Dissolution Risk Assessment 6
3.3. Seismicity 6
3.4. Hydrogeology and Hydrology 6
3.5. Radon 7
4.0 SITE INVESTIGATION 8
4.1. Scope of Works 8
4.2. Installations and Monitoring 8
4.3. Geotechnical Testing 8
5.0 GEOTECHNICAL EVALUATION 9
5.1. Ground Conditions 9
5.2. Topsoil /Made Ground 9
5.3. River Terrace Deposits 9
5.4. Undifferentiated Chalk 11
5.5. Groundwater Conditions 11
5.6. Infiltration Rates 11
5.7. Buried Concrete 12
5.8. Additional Comments 12
6.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS 13
6.1. Introduction 13
6.2. Key Considerations 13
6.3. Foundations 13
6.4. Floor slabs 17
6.5. Road Pavements 17
6.6. Buried Concrete 18
6.7. Drainage 18
6.8. Deep Made Ground and Historical Obstructions 18
6.9. Chalk Dissolution Features 19
6.10. Excavations 19
6.11. General Construction Advice 20
6.12. Recommendations for Further Work 20
TECHNICAL REFERENCES 21
LIMITATIONS 22
APPENDIX A: FIGURES
APPENDIX B: SITE INVESTIGATION INFORMATION

ARUN DISTRICT COUNCIL Y/153/21/DOC

EXECUTIVE SUMMARY AND ACTIONS

SITE LOCATION AND SETTING	The site is located in a rural setting on the western outskirts of the village of Yapton in West Sussex. It comprises agricultural land off Drove Lane, Yapton at a National Grid Reference (NGR) of 497354, 103152. The nearest postcode to the site is BN18 0EB (Drove Lane Farm). The general area is low lying at approximately 2-7m AOD (above ordnance datum) with the site typically residing at 5-6m AOD.
DEVELOPMENT PROPOSAL	The site has planning permission for residential development, including associated hard and soft landscaping.
ENVIRONMENTAL SETTING	The site is underlain by a thin layer of Topsoil / Made Ground into variable clays, silts and sands of the River Terrace Deposits into Undifferentiated Chalk bedrock. The superficial deposits are a classified Secondary A Aquifer and the bedrock is a Principal Aquifer.
CURRENT USE AND HISTORY	Historically the site was used as farmland as is today. Between 1876 and 1912 the Chichester and Arundel Canal was recorded to prominently run across the northern part of the site.
GEOTECHNICAL HAZARDS	The following geotechnical hazards have been identified as being associated with the site: • Compressible deposits • Clays of a low to medium volume change potential • Potential localised deep Made Ground associated with historical canal • Shallow groundwater • The potential for running sand conditions • The potential for chalk dissolution
GEOTECHNICAL RECOMMENDATIONS	**Foundations** Based on interpretation of factual ground investigations on the site to date, conventional shallow strip / trench fill foundations are considered viable on site if ground improvement is undertaken. Further in-situ testing is required to confirm the feasibility of ground improvement on site. If further testing determines that ground improvement is not feasible within areas of the site then deep piled foundations will be required in these areas. At the time of writing ground improvement in the form of vibro-stone columns and controlled modulus columns are considered the most suitable forms of ground improvement on site. **Floor Slabs** Suspended floor slabs are recommended on site. **Road Pavements** Assuming formation soils comprise River Terrace Deposits comprising Clay, a design long term equilibrium CBR value of 3% is recommended. **Buried Concrete** A concrete classification of DS-1 AC-1 is considered for the site. **Drainage** Drainage and other services will be affected by any large total or differential settlements. Drainage should be laid with increased falls and flexible service connections may be required. Design of infiltration drainage should take into account shallow groundwater, seasonal variations in groundwater level, chalk dissolution risk and results from infiltration testing. **Chalk Dissolution** Although not identified on site, the potential for chalk dissolution should be considered during future design phases.
GEOTECHNICAL ACTIONS	Additional ground investigations to investigate the nature of ground conditions associated with the historical canal in the north of the site should this form part of the built development. Chemical groundwater testing to assess how aggressive to buried concrete the groundwater is.

ARUN DISTRICT COUNCIL Y/153/21/DOC

	In-situ CBR testing to inform pavement designs. Cone penetration testing (CPT) on a plot by plot basis in order to establish the extent of the softer zones and obtain more detailed geotechnical parameters in order to inform ground improvement options. Should further testing show that ground improvement is unfeasible, deep rotary borehole investigations are required to inform pile design. A geotechnical advisor should be appointed to aid in the design development of the site. Once structural details of the development are finalised then a Geotechnical Design Report should be prepared.

ARUN DISTRICT COUNCIL Y/153/21/DOC

1.0 INTRODUCTION

1.1. Appointment and Scope

1.1.1. This report has been produced by Campbell Reith Hill LLP (CampbellReith) on behalf of the Trustees of the Langmead Pension Scheme (the Client) to summarise environmental and geotechnical information relating to Land East of Drove Lane, Yapton (hereafter referred to as the site). The references and limitations associated with this report follow the main text.

1.1.2. The report has been produced in general accordance with the procedures for ground investigation, interpretation and reporting set out in BS 10175:2011 (+A2:2017) and BS EN 1997 (Eurocode 7). The objective of the report is to collate and interpret Phase 1 Desk Study information and Phase 2 exploratory data in order to provide:

- A ground model for the site ground conditions.
- A geotechnical evaluation.
- Preliminary geotechnical design recommendations.

1.1.3. It should be recognised that further appraisals, investigations, specification and validation may be required to accord with the recommendations stated herein.

1.1.4. The report is based on previous and recent site investigations commissioned for the site and a review of readily available information, as referenced.

1.1.5. Geo-environmental advice is excluded and is beyond the scope / brief of this report.

1.2. Previous Investigations and Reports

1.2.1. The following previous reporting and site investigations have been made available for review and the information contained within has been considered when presenting the recommendations within this report:

- Phase 1 Geo-environmental Desk Study, Land at Drove Lane, Yapton, BRD, April 2017 (Report Reference: BRD2934-OR1-A)
- Phase 2 Geo-Environmental Site Investigations, Land at Drove Lane Yapton, BRD, November 2017 (Report Reference: BRD2934-OR2-B).

ARUN DISTRICT COUNCIL Y/153/21/DOC

2.0 SITE DESCRIPTION

2.1. Site Location

2.1.1. The site is located in a rural setting on the western outskirts of the village of Yapton in West Sussex.

2.1.2. The site location plan is presented in Figure 1, Appendix A.

2.1.3. It comprises agricultural land off Drove Lane, Yapton at a National Grid Reference (NGR) of 497354, 103152. The nearest postcode to the site is BN18 0EB (Drove Lane Farm).

2.1.4. The general area is low lying at approximately 2-7m AOD (above ordnance datum) with the site typically residing at 5-6m AOD.

2.1.5. Agricultural land is present to the site's northwest, east / southeast and south and predominantly residential land uses exist to the site's east and northeast.

2.2. Site Layout

2.2.1. The site is formed by two adjoining fields separated by a hedgerow. The smaller of the two fields is located in the north, with the larger field forming the majority of the site located to its southwest.

2.2.2. A site layout plan is presented in Figure 2, Appendix A.

2.2.3. Its northeast boundary is formed of fencing with a hedgerow, its eastern boundary is formed of hedgerows / trees, its western boundary is formed of a ditch and access road and its southwest boundary is understood to be formed by a footpath.

2.2.4. It is accessed in the west via Drove Lane.

2.2.5. Drainage ditches are present along its eastern, southern and western boundaries.

2.3. Site History

2.3.1. In 1876 the site comprised farmland with northwest-southeast striking Chichester and Arundel Canal crossing its northern area. Between 1897 and 1912 the eastern half of the canal appears to have been infilled.

2.3.2. Between 1912 and present day the site has remained as farmland, with no notable changes. The footprint of the canal gradually fades from mapping and is labelled as a path by 2017.

2.3.3. Today the historical footprint of the canal forms the boundary between the smaller northern field and the remainder of the site.

2.4. Unexploded Ordnance (UXO)

2.4.1. In reference to UXO risk maps [2] the site is located in an area of low bombing density.

2.4.2. A preliminary review has been made of the UXO risk presented by the site based upon CIRIA C681 ('Unexploded Ordnance (UXO) – A guide for the construction industry') and the assessment matrices presented in Tables 5.1-5.3 therein.

2.4.3. Due to the site's rural setting and the recorded bombing density in the area, the site is considered to be at a Low Risk from UXO(s).

ARUN DISTRICT COUNCIL Y/153/21/DOC

2.5. Tunnels and Infrastructure

2.5.1. In reference to CampbellReith's internal database records – GISSMo (Geographic Information System Site Model), no tunnels are recorded on site.

2.5.2. The Portsmouth and Arundel Canal was recorded to historically run between the northern field and the remainder of the site. It is unknown if any infrastructure associated with the canal remains on site.

2.5.3. Drainage ditches are understood to be present along the site's eastern, southern and western boundaries.

2.5.4. It should be noted that the above review does not constitute a formal review of all buried utilities that may be present at the site.

2.6. Redevelopment Proposal

2.6.1. The site has planning permission for residential development, including associated hard and soft landscaping.

2.6.2. The approved site development layout is shown in Figure 3, Appendix A.

ARUN DISTRICT COUNCIL Y/153/21/DOC

3.0 ENVIRONMENTAL SETTING

3.1. Geology

3.1.1. The site is recorded to be overlain by superficial deposits into Undifferentiated Chalk bedrock. The superficial deposits are recorded as Aeolian Deposits ('Brickearth') [1] on 1:50,000 British Geological Survey (BGS) geological mapping and Undifferentiated River Terrace Deposits [2] on online BGS mapping. It is considered that the online mapping represents the newer interpretation of the underlying geology from the BGS.

3.1.2. The Littlehampton Anticline is recorded to intercept the north western site boundary, striking northeast / southwest.

3.1.3. The below generalised sequence was encountered during previous ground investigations (Report: BRD2934-OR2-B).

- Topsoil / Made Ground up to 0.55m bgl – humic slightly gravelly or slightly sandy silty topsoil into slightly gravelly slightly sandy silty CLAY. Gravel of brick and flint.
- River Terrace Deposits up to 4.70m bgl – soft to stiff CLAY with variable silt, sand and gravel portions.
- Chalk up to >5.45m bgl – slightly clayey gravelly SILT or silty GRAVEL of flint and chalk fragments (CIRIA Grade Dm and Dc).

3.1.4. It is noted that Made Ground was recorded on a single occasion up to 1.10m bgl during previous investigations adjacent to some offsite garages in the north. This location was also the only location where coal ash formed the gravel constituent of the Made Ground.

3.2. Preliminary Chalk Dissolution Risk Assessment

3.2.1. CampbellReith is not aware of any chalk dissolution features within 1000m of the site and none were recorded during previous ground investigations. However, due to the site's topographical and geological setting it is considered to be at Moderate Risk from chalk dissolution.

3.3. Seismicity

3.3.1. The national forward to BS EN 1998-1:2004+A1:2013 'Eurocode 8: Design of Structures for Earthquake Resistance – Part 1' states there are no requirements in the UK to consider seismic loading, and the whole of the UK may be considered an area of very low seismicity in which the provisions of EN 1998 need not apply.

3.4. Hydrogeology and Hydrology

3.4.1. The site hydrogeology and hydrology are summarised in Table 3.1.

3.4.2. Groundwater was encountered during previous investigations between 3.60-3.80m bgl and was monitored between 2.34-3.84m bgl during return monitoring visits over the months of September and October.

ARUN DISTRICT COUNCIL Y/153/21/DOC

TABLE 3.1: Summary of Hydrogeology and Hydrology

Type	Description
River Terrace Deposits	Secondary Aquifer A.
Undifferentiated Chalk	Principal Aquifer.
Source Protection Zones (SPZs)	The site is understood to not be located within a SPZ.
Nearest surface water source	Drainage ditches are understood to be present along the site's eastern, southern and western boundaries.

3.5. Radon

3.5.1. The site is located in an area where <1% of homes are above the Action Level for radon and therefore it is considered unlikely that radon protection measures will be required on site.

ARUN DISTRICT COUNCIL Y/153/21/DOC

4.0 SITE INVESTIGATION

4.1. Scope of Works

4.1.1. Ground investigation works were undertaken on behalf of CampbellReith by Harrisons Group Environmental Ltd. The principal objective of these works was to provide information on groundwater and soakage rates to inform the drainage design for the site but geotechnical testing was also scheduled to make best use of the survey effort. The scheduled site work comprised:

Main Phase (12th-14th December 2018)

- 11no. Windowless Sampler Boreholes up to 5.75m bgl

Second Phase (25th-28th March 2019)

- 7no. Shallow Percolation Tests at 0.50m bgl

4.1.2. The exploratory hole location plan is presented in Figure 4, Appendix A.

4.1.3. The corresponding Factual Ground Investigation Report is contained in Appendix B.

4.2. Installations and Monitoring

4.2.1. Groundwater and gas monitoring installations were installed in all windowless sampler borehole locations.

4.2.2. 5no. rounds of gas and groundwater monitoring rounds were undertaken between December 2018 and April 2019. Monitoring included the historical exploratory locations WS06 and WS10 from previous investigations (Report: BRD2934-OR2-B).

4.2.3. The installation details and monitoring results are presented in the Factual Ground Investigation Report. During ground investigations groundwater was encountered between 2.20-4.10m bgl and 1.56-3.54m AOD. During return monitoring visits groundwater was recorded between 0.34-3.98m bgl and 2.24-6.10m AOD.

4.3. Geotechnical Testing

4.3.1. In-situ geotechnical testing was undertaken and geotechnical samples obtained for geotechnical laboratory testing. The laboratory testing was scheduled by CampbellReith and undertaken by Harrisons Testing Services.

4.3.2. The details of the undertaken tests and associated results are presented within the Factual Ground Investigation Report.

ARUN DISTRICT COUNCIL Y/153/21/DOC

5.0 GEOTECHNICAL EVALUATION

5.1. Ground Conditions

5.1.1. The ground conditions encountered during the site investigation generally comprised a sequence of Topsoil or Made Ground into Superficial River Terrace Deposits underlain by Undifferentiated Chalk bedrock.

TABLE 5.1: Soil Profile

Stratum	From (m bgl)	To (m bgl)	Maximum Recorded Thickness (m)
Topsoil / Made Ground	0.00	0.15-0.25	0.25
River Terrace Deposits	0.15-0.25	2.90-4.65	4.45
Undifferentiated Chalk	2.90-4.65	5.75+	2.10+

5.1.2. The ground model as encountered in Table 5.1 broadly agrees with the conditions anticipated from previous reporting.

5.2. Topsoil /Made Ground

5.2.1. Topsoil was recorded up to 0.25m bgl in percolation test pits, with the exception of PO206 in the north of the site. It generally comprised soft locally slightly gravelly CLAY with occasional rootlets.

5.2.2. Made Ground representative of topsoil was recorded in all windowless sampler borehole locations up to maximum depths of 0.25m bgl. It general comprised very soft to soft slightly gravelly to gravelly slightly organic CLAY with the exception of WS206 where it comprised very soft slightly gravelly slightly organic clayey SILT. The gravel constituent was of angular to sub-rounded fine to coarse brick and flint.

5.2.3. A summary of in-situ and laboratory geotechnical test results is presented in Table 5.2.

5.2.4. A sample taken from a described natural CLAY layer was obtained from PO204. During particle size distribution (PSD) testing the sample was recorded to contain brick fragments and therefore is considered to be Made Ground. The results from the PSD test undertaken on this sampler are included within Table 5.2.

TABLE 5.2: Summary of Soil Parameters for Topsoil / Made Ground Deposits

Soil Parameters	Number of Tests	Range of Results			
Moisture Content (%)	1	26.5			
Particle Size Distribution (PSD) (%)	2	Clay/Silt	Sand	Gravel	Cobbles
		77-91	8-18	1-5	0

5.3. River Terrace Deposits

5.3.1. River Terrace Deposits were recorded in all exploratory locations on site underlying Topsoil or Made Ground, with the exception of PO206 where they were recorded from ground level. They

ARUN DISTRICT COUNCIL Y/153/21/DOC

were recorded up to a maximum depth of 4.65m bgl, however, their depth to base was not proven in any of the percolation test pits or in WS201 and WS205. Therefore, the presence of these deposits to depths >4.65m bgl cannot be discounted.

5.3.2. River Terrace Deposits generally comprised a bed of very soft to firm CLAY into SILT or loose to medium dense SAND. On an occasion in WS208 a sequence of very soft CLAY into loose to medium dense SAND into gravelly SILT was recorded.

5.3.3. A summary of in-situ and laboratory geotechnical test results are presented separately for the CLAY, SAND and SILT beds in Tables 5.3, 5.4 and 5.5 respectively.

5.3.4. A single PSD test was undertaken on a sample from a described SILT bed. The results of the test indicate a clayey SAND / GRAVEL. It is therefore is considered that the description of SILT beds in field may be incorrect.

5.3.5. Two SPT test 'N60' values were recorded beneath a SAND bed in WS201, however no descriptions or samples were obtained for the tested material. These results have been discounted from the subsequent analysis.

TABLE 5.3: Summary of Test Results for Clay River Terrace Deposits

Soil Parameters	Number of tests	Range of results			
Liquid Limit (%)	12	25-43			
Plastic Limit (%)		15-22			
Plasticity Index (%)		10-22			
Modified Plasticity Index %)		9.1-22			
Plasticity		CL-CI			
Volume Change Potential (NHBC)		Low-Medium			
Moisture Content (%)	22	19.0-32.8			
SPT 'N_{60}' Values	23	0-16			
Particle Size Distribution (PSD) (%)	5	Clay/Silt	Sand	Gravel	Cobbles
		44-93	6-54	0-3	0

TABLE 5.4: Summary of Test Results for Sand River Terrace Deposits

Soil Parameters	Number of tests	Range of results			
Moisture Content (%)	1	17.9			
SPT 'N_{60}' Values	8	10-32			
Particle Size Distribution (PSD) (%)	2	Clay/Silt	Sand	Gravel	Cobbles
		30-38	45-48	18-22	0

ARUN DISTRICT COUNCIL Y/153/21/DOC

TABLE 5.5: Summary of Test Results for Silt River Terrace Deposits

Soil Parameters	Number of tests	Range of results			
SPT 'N_{60}' Values	5	0-52			
Particle Size Distribution (PSD) (%)	1	Clay/Silt	Sand	Gravel	Cobbles
		34	32	34	0

5.4. Undifferentiated Chalk

5.4.1. Undifferentiated Chalk was recorded to underlie River Terrace Deposits up to exploratory hole completion, where encountered. It was observed to a maximum exploration depth of 5.75m bgl.

5.4.2. It was recovered as either structureless CHALK composed of cream to white silty GRAVEL (Dc Grade) or gravelly SILT (Dm Grade). The clasts and gravels were recorded to be moderately weak, predominantly low density, angular to sub-rounded fine to coarse of chalk with frequent flint fragments.

5.4.3. In reference to CIRIA C574 [4], dry density and saturated moisture content results indicate low to medium density chalk.

5.4.4. A summary of in-situ and laboratory geotechnical test results is presented Table 6.4.

5.4.5. Low SPT 'N60' values of <10 were recorded between 3.00-4.00m bgl in the Undifferentiated Chalk and are indicative of the weathering of upper layers of the chalk bedrock.

TABLE 6.4: Summary of Test Results for Undifferentiated Chalk

Soil Parameters	Number of tests	Range of results
Moisture Content (%)	3	22-26
Bulk Density (Mg/m^3)		1.86-1.97
Dry Density (Mg/m^3)		1.51-1.57
Saturated Moisture Content (%)		26.60-29.00
SPT 'N_{60}' Values	18	4-79

5.5. Groundwater Conditions

5.5.1. Groundwater was encountered between 2.20-4.10m bgl during ground investigations.

5.5.2. During return monitoring visits standing water level was recorded between 0.34-3.98m bgl. At its shallowest standing water level was recorded between 0.34-2.34m bgl in soft to very soft CLAY of the River Terrace Deposits.

5.5.3. Based on results, groundwater level is shown to vary seasonally on site.

5.6. Infiltration Rates

5.6.1. The feasibility of shallow infiltration drainage was tested on site through percolation tests at 0.50m bgl in the initial CLAY bed of the River Terrace Deposits. The equivalent infiltration rates calculated by Harrisons Group Environmental from percolation test results are summarised in Table 6.5.

ARUN DISTRICT COUNCIL Y/153/21/DOC

TABLE 6.5: Equivalent Infiltration Rates from Percolation Tests

Exploratory Hole	Stratum	Response Zone (m bgl)	Calculated Permeability (m/s)
PO201	Slightly sandy CLAY	0.20-0.50m bgl	6.48×10^{-6}
PO202			7.66×10^{-6}
PO203			9.70×10^{-6}
PO204			2.72×10^{-6}
PO205			8.88×10^{-6}
PO206			8.37×10^{-6}
PO207			2.08×10^{-6}

5.7. Buried Concrete

5.7.1. Ten soil samples, comprising nine from the River Terrace Deposits and one from the Undifferentiated Chalk were subjected to pH and water soluble sulphate determinations. With reference to BRE Digest SD1 (2005 Ed), the results indicate DS-1, AC-1 classifications.

5.7.2. The above samples were also subjected to total sulphur and acid soluble sulphate content testing to allow an assessment to be made in relation to the potential thaumasite form of concrete attack. None of the oxidisable sulphides values calculated were in excess of 0.3%. Consequently, the results are not considered indicative of significant risk from this form of concrete attack.

5.7.3. No groundwater samples were subjected to sulphate and pH determinations.

5.8. Additional Comments

5.8.1. Instabilities were recorded in WS208 in Dm Grade Undifferentiated Chalk after a SPT test was undertaken.

5.8.2. No obstructions were recorded on site.

5.8.3. No exploratory hole locations were progressed within the area understood to form the footprint of the historical canal because there is no built development proposed in this area of the site.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

6.1. Introduction

6.1.1. The site has planning permission for residential development with associated soft / hard landscaping. The approved development layout is presented in Figure 3, Appendix A.

6.1.2. Details of the structure, proposed layouts and anticipated loadings were under development at the time of the writing of this report, which is based on a preliminary investigation. Further investigation will be required once proposals are fully developed and a detailed Geotechnical Design Report should be prepared. The primary purpose of this report is to identify risk, allow design development and inform cost estimates.

6.2. Key Considerations

6.2.1. The following geotechnical risks are considered to be present on site:

- Compressible deposits
- Clays of a low to medium volume change potential
- Potential localised deep Made Ground associated with historical canal
- Shallow groundwater
- The potential for running sand conditions
- The potential for chalk dissolution

6.3. Foundations

Shallow Foundations

6.3.1. Made Ground is not a suitable founding stratum due to its poor load bearing characteristics.

6.3.2. The River Terrace Deposits are variable in nature. SPT 'N60' values of 0 in CLAY and SILT beds indicate the presence of extremely soft beds and field descriptions and SPT values in SAND beds indicate very loose material. Although firm CLAY and medium dense SAND beds are recorded, SPT 'N60' values indicate that extremely soft or very loose beds are present up to 3.00m bgl.

6.3.3. It is considered that loose or worse SAND and soft or worse CLAY or SILT horizons are unsuitable founding strata without suitable ground improvement due to their susceptibility to compression.

6.3.4. It is considered that firm or better CLAY or SILT and medium dense or better SAND of the River Terrace Deposits may be suitable founding strata, however additional ground investigations would be required in order to further delineate the location of these layers.

6.3.5. It is considered that an allowable bearing capacity of 75kPa would be suitable for firm or better CLAY or SILT beds of the River Terrace Deposits, considering a foundation up to 1m width.

6.3.6. The presence of shallow groundwater on site will reduce the bearing capacity of granular deposits of the River Terrace Deposits. It is considered that an allowable bearing capacity of 70kPa would be suitable for medium dense of better SAND assuming worst case groundwater at ground level and a maximum foundation width of 1m.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.3.7. The above allowable bearing capacities assume that firm / medium dense bearing strata are present at suitably homogenous thicknesses and depths below formation level. Foundations should not straddle different strata in order to avoid issues with differential settlement. If this is unavoidable, it is recommended that foundations are deepened until homogenous founding strata is reached.

6.3.8. The depth of shallow foundations will governed by the depth to suitable founding strata. It is generally considered that foundation depths in excess of 2.5m bgl are unfeasible from a cost perspective.

6.3.9. Undifferentiated Chalk bedrock is recorded on site from 2.90m bgl and therefore it is considered unlikely to be present from a suitable depth to be used as a founding strata for shallow foundations.

6.3.10. All foundations should be deepened past any soft or worse and loose or worse deposits. It is noted that in WS204, located in the southeast of the site, the strength of the CLAY reduced with depth. Furthermore, in WS209, WS210 and WS211 in the north of the site, very low strength chalk was recorded to underlie the River Terrace Deposits. Therefore, the presence of unsuitable compressible strata beneath suitable founding strata cannot be entirely discounted and the absence of such should be proven prior to the formation of foundations in order to avoid issues with settlement. Where such compressible strata is encountered it is recommended that foundations are deepened until suitable homogenous founding strata is encountered.

6.3.11. Any foundations formed in cohesive soils will require deepening to a minimum of 0.90m bgl in accordance with NHBC Standards Chapter 4.2 [6] based on a low to medium volume change potential, not taking into account the presence of trees or shrubs. Foundations will require further deepening in accordance with NHBC Standards if located within the zone of influence of any trees to be removed / retained / planted and past any zones of desiccation / organic inclusions, if encountered.

6.3.12. Heave protection is recommended on site in accordance with NHBC Standards and should be designed based on the low to medium volume change potential of soils on site.

6.3.13. Issues with excavation instability in foundation excavations should be taken into account, including the potential for shallow groundwater and running sand conditions. Recommendations for the management of excavation stability are outlined in Section 6.10.

6.3.14. Notwithstanding the above, due to the depth and variability weak compressible strata exhibiting SPT 'N60' values of <10 extending up to 4.00m bgl, and the complexities of identifying these weak layers it is considered likely that ground improvement or deep piled foundations will be required on site.

Ground Improvement

6.3.15. The use of ground improvement may be considered on site to improve the strength of the River Terrace Deposits.

6.3.16. With respect to ground improvement options, the advice of reputable specialist contractors experienced in the ground conditions considered here should be sought prior to detailed design. They should be responsible for the selection of appropriate equipment and the final design of the treatment.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.3.17. The restrictions that would need to be considered by the specialist would include: noise and vibration, organic and other deleterious matter content in the ground, proximity of nearby structures and other sensitive site uses. Specialist contractors may request sight of ground conditions for themselves through trials pits or other investigation methods before the suitability of any given technique can be confirmed.

6.3.18. Based on the recorded ground conditions, the River Terrace Deposits may be amenable to treatment by the formation of vibro-stone columns in both cohesive and granular soils. Where significant portions of soft clays are present, use of vibro-concrete columns or controlled modulus columns may be given consideration. Thought may also be given to dynamic compaction in granular soils and lime stabilisation in clay soils.

6.3.19. The impact of the chosen ground improvement method on the Undifferentiated Chalk bedrock should be suitably assessed. In reference to C574, the use of vibro-stone columns can result in the formation of liquefied slurry chalk at the toe of the column and settlements may occur when loaded. Furthermore, as the formed columns can act as vertical drains and therefore cause the inundation of water into chalk bedrock there is an added risk of chalk dissolution and collapse settlement, although this is considered less of a risk as head of the chalk is typically below the groundwater table.

6.3.20. Although results indicate that ground conditions on site are not particularly aggressive to buried concrete, the use of lime stabilisation should be suitably critiqued if it is proposed as the addition of lime increases soil pH which in turn can heighten risk of aggressive ground conditions and swelling due to the formation of ettringite crystals. Further testing would be recommended to confirm this.

6.3.21. A specialist ground improvement was contacted for early contractor involvement advice regarding ground improvement on site. The provided comments were based on a low rise (1-2 storey) residential development, utilising conventional strip footings (0.60-0.75m widths) and suspended floor slabs. They have suggested that treatment with their dry bottom feed system to form vibro stone columns (VSCs) to depths of 3.50-4.00m depths would suitably treat the majority of the site, providing post-treatment bearing pressures of 100kPa. However, where softer zones are present e.g. WS204, WS206 and WS207 along the centre of the site, as indicated through extremely low SPT counts, VSC are not considered suitable as softer zones are unlikely to afford sufficient lateral restraint for column formation. In these softer areas, it was suggested that thought is given to the use of controlled modulus columns (CMCs), which would be envisaged to provide post-treatment bearing pressures of 150kPa.

6.3.22. Another ground improvement contractor was also contacted for early contractor involvement in regards to ground improvement on site and also suggested that VSCs may be suitable for areas of the site depending on the extent of soft zones and silt and the presence of chalk bedrock and potential chalk dissolution risk associated with the method. In areas of the site where ground improvement is not suitable they have suggested the use of driven pile pre-cast and beam foundation systems.

6.3.23. In order to inform specific ground improvement options on site, it is recommended that cone penetration testing (CPT) is undertaken on a plot by plot basis in order to establish the extent of the softer zones and obtain more detailed geotechnical parameters; in doing so determining suitability and the split between VSC and CMC on site.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.3.24. In regards to chalk dissolution risk associated with VSC, it is envisaged that the risk can be lowered / mitigated through either a blinding layer above the VSC once installed, not penetrating the chalk bedrock with the columns the formation of a mortar / concrete plug at the base of the VSC. Alternatively undertaking all ground treatment using CMCs could be undertaken which would remain cost effective when compared to traditional piling methods.

6.3.25. Surcharging is also considered a viable ground improvement option, effective on both soft cohesive and loose granular soils. If chosen, consideration should be given to the surcharge loads in relation to proposed developments, anticipated consolidation time, short term, creep and long term settlement monitoring and groundwater conditions and monitoring.

6.3.26. It is noted here that ground improvement does not remove the risk of heave on site and that this should be taken into account with appropriate void formers and appropriate foundation depths as per NHBC guidelines.

6.3.27. During design development, should the use of ground improvement be considered unfeasible in areas of the site due to the results from further testing or from an economical point of view, the use of deep piled foundations will be required in these areas.

Deep Piled Foundations

6.3.28. The advice of reputable piling specialists, experienced in the ground conditions considered here, should be sought. They should be responsible for the selection of appropriate piling equipment and the final design of the piles. Given below are some preliminary comments to inform pile design.

6.3.29. The site is likely to be amenable to either CFA or bored piles and potentially driven piles. The use of driven piles will be subject to allowable levels of vibration and noise within the area.

6.3.30. Bored piles would require casing to support the pile bore through the underlying granular strata. Further, there is the risk to bore pile instability from water seepages which will likely require the use of a bentonite slurry or other suitable support fluid.

6.3.31. CFA piles are generally limited to 25m for smaller diameter piles (<400mm) and 30m for larger diameter piles (>600mm), which should be taken into account when determining the number of piles under heavily loaded areas. CFA piles require good workmanship to ensure they are adequately constructed.

6.3.32. Piled foundations should be designed in accordance with C574 and PR86 [5].

6.3.33. In accordance with C574, the chalk on site is considered to be low to medium density and of Dc or Dm grade. The initial rock head of the chalk indicates significant weathering through low SPT 'N60' values.

6.3.34. Pile design should take into account the potential for chalk dissolution / differential weathering. Piles should extend past any zones of weakness into competent chalk. The pile designer may consider utilising techniques such as pre-probing, Cone Penetration Tests (CPT's) and / or Super Heavy Dynamic Probing to assess the presence of chalk dissolution at proposed pile locations.

6.3.35. The requirements for void formers below ground beams and pile caps, and against the inside faces of external ground beams and pile caps, should be followed in accordance with NHBC Standards.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.3.36. Whilst the specialist piling contractor would be responsible for detailed design, for preliminary guidance, indicative safe working loads for CFA piles constructed from existing ground level are given in Table 8.2. These were undertaken in general accordance with Tomlinson [7], PR86 and C574, however, may require consideration against appropriately factored design actions as detailed in EC7.

6.3.37. It is noted that the below ground model and calculations are based on ground investigation information significantly limited by depth, with the maximum depth at which in-situ testing was undertaken being 5.45m bgl. Consequently the ground profile beyond 5.45m bgl has had to be assumed. Consequently should piling be proposed at the site, additional deep rotary core boreholes will be required on site to confirm ground conditions at depth and inform pile design.

6.3.38. Table 8.2: Indicative Safe Working Loads for CFA Piles

Pile diameter	Safe Working Loads (kN) Pile length			
	10m	**15m**	**20m**	**30m**
300mm	160	300	520	-
450mm	300	560	940	1100
600mm	490	870	1400	1700

6.3.39. The estimated Safe Working Loads in Table 8.2 are based on the following assumptions:

- From 0m – 4m bgl Topsoil / Made Ground or very soft CLAY or very loose SAND - no contribution to design resistance.
- From 4m – 5m bgl weathered Differentiated Chalk = β = 0.45, N=4 and Phi = 45°
- From 5m – 30m bgl Undifferentiated Chalk, β = 0.45, N= 14-50 and Phi = 45°
- Groundwater from ground level (0m bgl).
- The self-weight of the pile and the weight of soil removed/displaced during pile construction approximately cancel each other.
- Pile spacing of at least 3 x pile diameter.
- Negative skin friction not accounted for.

6.3.40. The adoption of maintained load tests in accordance with EC7 would enable increased capacities or shorter piles to be adopted. The piling specialist may choose to adopt alternative parameters to those outlined above however, their suitability should be verified by an experienced geotechnical engineer.

6.4. Floor slabs

6.4.1. It is recommended that suspended floor slabs are used on site due to the compressible nature of the River Terrace Deposits and the medium volume change potential of associated clay soils.

6.5. Road Pavements

6.5.1. Due to the presence of compressible soils and soils of a volume change potential on site, pavement surfaces should be constructed in flexible materials such as bituminous compounds or

ARUN DISTRICT COUNCIL Y/153/21/DOC

block paving which are more easily able to accommodate ground movement and can be more easily repaired. The formation level should be rolled and inspected for any soft or loose material. These materials should be removed and replaced with granular fill placed and compacted in accordance with suitable specification.

6.5.2. Assuming formation soils comprise River Terrace Deposits comprising Clay, a design long term equilibrium CBR value of 3% is recommended.

6.5.3. It is recommended that in-situ CBR testing is undertaken on site to confirm the suitability of the above CBR values for use in pavement design.

6.5.4. Due to the variability of grain sizes within the River Terrace Deposits and the engineering nature of Made Ground and chalk, all strata on site are considered susceptible to frost heave.

6.5.5. It is anticipated that road pavement will require construction on fill in areas where significant depths of compressible strata are present. It is recommended that such fill is placed and compacted in accordance with a suitable specification based on the Specification for Highway Works. Pavement surfaces should be constructed in flexible materials such as bituminous compounds or block paving. The CBR value to be adopted would depend on nature of the fill specification adopted and the as built quality of the fill.

6.6. Buried Concrete

6.6.1. A concrete classification of DS-1 AC-1 is considered acceptable for ground conditions on site.

6.6.2. It is recommended that groundwater samples are obtained and tested to assess the how aggressive groundwater is to buried concrete.

6.7. Drainage

6.7.1. Drainage and other services will likely be affected by any large total or differential settlements due to the presence of compressible and medium volume change potential soils on site. Drainage should be laid with increased falls and flexible service connections may be required.

6.7.2. The design of drainage should take into account the risk of chalk dissolution on site. The point discharge of drainage waters e.g. through soakaways results in the concentration of water ingress into chalk bedrock and can initiate the formation of new dissolution features, or worsening / destabilisation of those already present. It is therefore recommended that any drainage water discharges are designed in accordance with guidance contained in CIRIA C574.

Infiltration Drainage

6.7.3. No specific comment on infiltration drainage is made here as the results of ground investigation relevant to surface water drainage have previously been incorporated within the Drainage Strategy for the site (Drawing Reference: 13024-CRH-Z1-SK-00-C-5054-P1).

6.8. Deep Made Ground and Historical Obstructions

6.8.1. Previous investigations undertaken by BRD in the form of WS01, WS05, WS06 and TP11 were undertaken in proximity to the historical canal. The geological logs associated with these exploration positions did not indicate significant thicknesses of Made Ground / infill material and as such are suspected to have be undertaken outside the canals footprint.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.8.2. Ground conditions associated with the canal's footprint are considered likely to comprise clay rich soils if a clay lining was used for its construction, variable Made Ground associated with infilling and soft / loose sediment with organics associated with its base. Such ground conditions are not considered suitable for load bearing.

6.8.3. Obstructions associated with the structure of the canal or its use may also be present and could impede intrusive ground works.

6.8.4. Recent ground investigations were not carried out over or in the vicinity of the footprint of the historical canal as it is understood that this area does not form part of the built development. Should this change, it is recommended that further investigations are undertaken to confirm the ground conditions associated with the canals footprint.

6.9. Chalk Dissolution Features

6.9.1. The site is considered to be at a moderate risk from chalk dissolution based on its geological and topographical setting.

6.9.2. No chalk dissolution features were identified during ground investigation works, however, it is noted that such features are locally formed and therefore can be easily missed during intrusive excavations. The presence of unrecorded chalk dissolution features on site therefore cannot be discounted.

6.9.3. In reference to C574, it is recommended that if / when chalk dissolution features are encountered, the following treatment techniques are given thought to:

- Excavation of the feature and replacement with compacted suitable material.
- Bridging of the feature to avoid direct loading.
- Ground stabilisation / treatment through grouting.
- Use of piled foundation solutions.
- Close control of drainage.

6.9.4. It may be prudent to further investigate the presence, nature and extent of potential chalk dissolution features on site. Ground investigations may include the use of Super Heavy Dynamic Probes in grids across development footprints.

6.9.5. Any further ground investigation should be designed by a suitably qualified person and investigate the presence of chalk dissolution beneath and in the vicinity of proposed structures, including but not limited to foundations, retaining structures and drainage locations.

6.9.6. Alternatively, foundations and floor slabs could be designed to span dissolution features.

6.10. Excavations

6.10.1. It is considered that excavations within the granular beds of the River Terrace Deposits and in the Undifferentiated Chalk cannot be relied on. There is considered to be further risk to excavation stability in the form of running sands where the granular beds of the River Terrace Deposits are water bearing.

6.10.2. It is recommended that allowances are be made for shoring / battering faces back to a safe angle of repose and dewatering.

ARUN DISTRICT COUNCIL Y/153/21/DOC

6.11. General Construction Advice

6.11.1. It should be possible to use conventional excavators to form excavations in the soils encountered during the investigation. However, use of breaking apparatus may be required in the unlikely event that hard surfacing, old foundations, relict basement construction and the like, are encountered.

6.11.2. For any load bearing formations, careful inspection should be undertaken to ensure placement in competent natural strata unless ground treatment has been carried out and properly validated. Any soft spots identified should be excavated and replaced with compacted granular fill or lean mix concrete. Concrete should be placed as soon as possible following excavation to avoid softening of the ground. A similar recommendation is also made for road pavement formations, although compacted granular fill could be used instead of concrete.

6.11.3. Any relic foundations or other subterranean structures beneath the footprint of the proposed buildings should be fully grubbed out. Such excavations should be surveyed and backfilled with an acceptable granular fill, placed and compacted to an engineering specification. The same recommendations are made for excavations that may be required to remove soil contamination.

6.11.4. In areas of road pavements and hard standing, relic subterranean structures should be broken down to around 1m below finished site level to minimise the risk of differential settlement due to the presence of hard spots. In soft landscaped areas it may be possible to limit such operations to 0.50m bgl.

6.12. Recommendations for Further Work

6.12.1. The preceding sections have provided outline preliminary recommendations for the proposed development of the site, however, further investigation and analysis will be required to fully quantify the risks and allow detailed design. Further investigation should comprise:

- Additional ground investigations to investigate the nature of ground conditions associated with the historical canal in the north of the site should this form part of the built development.
- Chemical groundwater testing to assess how aggressive to buried concrete the groundwater is.
- In-situ CBR testing to inform pavement designs.
- Cone penetration testing (CPT) on a plot by plot basis in order to establish the extent of the softer zones and obtain more detailed geotechnical parameters in order to inform ground improvement options.
- Should further testing show that ground improvement is unfeasible in areas of the site, deep rotary borehole investigations are required to inform pile design.
- A geotechnical advisor should be appointed to aid in the design development of the site.
- Once structural details of the development are finalised then a Geotechnical Design Report should be prepared.

ARUN DISTRICT COUNCIL Y/153/21/DOC

TECHNICAL REFERENCES

Reference	Reference Title	Type
[1]	BGS Geological Map 1:50,000 Sheet 317/332 Chichester and Bognor, BGS, 1996.	Geological Map
[2]	BGS Geoindex Onshore Map, BGS, Accessed August 2019 (website: http://mapapps2.bgs.ac.uk/geoindex/home.html)	Online Map
[3]	Zetica UXO Risk Maps, Zetica, Accessed July 2019 (website: https://zeticauxo.com/downloads-and-resources/risk-maps/)	Online Map
[4]	CIRIA 574: Engineering In Chalk, CIRIA, 2002.	Report
[5]	PR86: Shaft friction of CFA Piles in Chalk, CIRIA, 2003.	Report
[6]	NHBC Building Standards, NHBC, 2019.	Standard
[7]	Tomlinson, Foundation Design and Construction, 2001.	Textbook

ARUN DISTRICT COUNCIL Y/153/21/DOC

LIMITATIONS

Environmental & Geotechnical Interpretative Reports

1. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the client.
2. Where any data or information supplied by the client or other external source, including that from previous studies, has been used, it has been assumed that the information is correct. No responsibility can be accepted by CampbellReith for inaccuracies within this data or information. In relation to historic maps the accuracy of maps cannot be guaranteed and it should be recognized that different conditions on site may have existed between and subsequent to the various map surveys.
3. This report is limited to those aspects of historical land use and enquiries related to environmental matters reported on and no liability is accepted for any other aspects. The opinions expressed cannot be absolute due to the limit of time and resources implicit within the agreed brief and the possibility of unrecorded previous uses of the site and adjacent land.
4. The material encountered and samples obtained during on-site investigations represent only a small proportion of the materials present on the site. There may be other conditions prevailing at the site which have not been revealed and which have therefore not been taken into account in this report. These risks can be minimised and reduced by additional investigations. If significant variations become evident, additional specialist advice should be sought to assess the implications of these few findings.
5. The generalised soil conditions described in the text are intended to convey trends in subsurface conditions. The boundaries between strata are approximate and have been developed on interpretations of the exploration locations and samples collected.
6. Water level and gas readings have been taken at times and under conditions stated on the exploration logs. It must be noted that fluctuations in the level of groundwater or gas may occur due to a variety of factors which may differ from those prevailing at the time the measurements were taken.
7. Please note that CampbellReith cannot accept any liability for observations or opinions expressed regarding the absence or presence of asbestos or on any product or waste that may contain asbestos. We recommend that an asbestos specialist, with appropriate professional indemnity insurance, is employed directly by the client in every case where asbestos may be present on the site or within the buildings or installations. Any comments made in this report with respect to asbestos, or asbestos containing materials, are only included to assist the client with the initial appraisal of the project and should not be relied upon in any way.
8. The findings and opinions expressed are relevant to those dates of the reported site work and should not be relied upon to represent conditions at substantially later dates.
9. This report is produced solely for the benefit of the client, and no liability is accepted for any reliance placed upon it by any other party unless specifically agreed in writing.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Appendix A: Figures

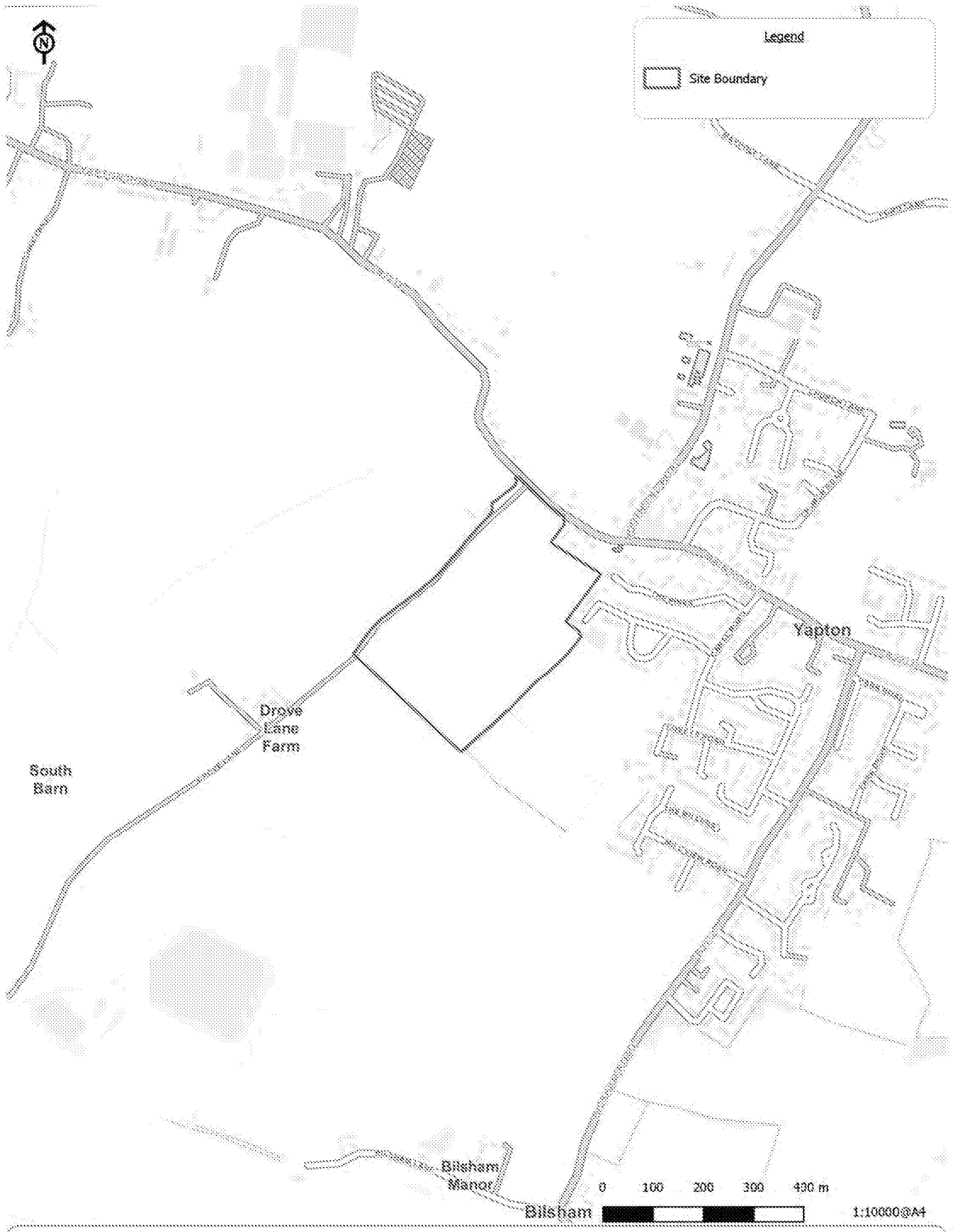
Figure 1: Site Location

Figure 2: Site Layout

Figure 3: Proposed Development

Figure 4: Ground Investigation Locations

ARUN DISTRICT COUNCIL Y/153/21/DOC



Land East of Drove Lane, Yapton

Client: Landlink Estates

Figure 1:
Site Location Plan

Scale: 1:10000@A4
CampbellReith GIS Copyright: © Crown copyright. All rights reserved. Licence number 100020027
Contains Ordnance Survey data © Crown copyright and database right 2019.
Job Number: 13024
Drawn by - Checked by: RP - TEF
Drg No - Status/Revision: GIS005 - A
File location: N:\13050 - 13249\13024 R - Land East of Drove Lane Yapton\Project Workspace\GIS (pdf in
Date (Revision History): Outputs)

CampbellReith
LONDON 020 7340 1700 ☐ ☐ MANCHESTER 0161 819 3060
REDHILL 01737 784 500 ☒ ☐ BIRMINGHAM 01675 467 484
BRISTOL 0117 916 1066 ☐ ☐ DUBAI 00 971 4453 4735
www.campbellreith.com

ARUN DISTRICT COUNCIL V/153/21/DOC


MAIN ROAD
DROVE LANE


MAIN ROAD
DROVE LANE



ARUN DISTRICT COUNCIL Y/153/21/DOC

Appendix B: Factual Report

ARUN DISTRICT COUNCIL Y/153/21/DOC

HARRISON GROUP ENVIRONMENTAL LIMITED

Document: Ground Investigation Factual Report

Project: Land East of Drove Lane, Yapton

Reference No.: GL22428A

Date: April 2019

Prepared For: Trustees of the Langmead Pension Scheme c/o Landlink Estates Ltd.

Engineer: Campbell Reith Hill LLP

REPORT STATUS:

		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
FINAL	REV 1	INIT JS SIGN [redacted] COMMENTS DATE 17/04/2019	INIT MC SIGN COMMENTS DATE 17/04/2019	INIT JS SIGN COMMENTS DATE 17/04/2019	INIT MC SIGN COMMENTS DATE 17/04/2019
Revision	**Comments**	**Prepared By**	**Approved By**	**Issued By**	**Audited By**

This sheet to be kept on PSI / Report file.
Auditors to insert their comments on the table, to annotate the report itself or provide comments on a separate sheet. (Please state which)
For final reports a hard copy of the signed off form will be kept on the appropriate QA file.

Document:	Ground Investigation Factual Report
Project:	Land East of Drove Lane, Yapton
Reference No:	GL22428A
Date:	April 2019
Prepared for:	Trustees of the Langmead Pension Scheme c/o Landlink Estates Ltd
Engineer:	Campbell Reith Hill LLP

harrisongeotechnical
ENGINEERING



A division of Harrison Group Environmental Limited

ARUN DISTRICT COUNCIL 11 APR 2019 DEC

CONTENTS

FOREWORD

1.0 TERMS OF REFERENCE AND INTRODUCTION 1

2.0 LOCATION AND DESCRIPTION OF SITE 1

3.0 EXPECTED GEOLOGY 1

4.0 FIELDWORK 1

4.1 Dynamic Continuous Sampling (Windowless Sampler) Boreholes 2

4.2 Percolation Testing 2

4.3 Installations 3

4.4 Surveying 4

4.5 Gas and Groundwater Monitoring 4

5.0 GEOTECHNICAL TESTING 4

5.1 In-Situ Testing 4

5.2 Geotechnical Laboratory Testing 5

REFERENCES

APPENDICES

ARUN DISTRICT COUNCIL Y/153/21/DOC

FOREWORD

General Conditions Relating To Site Investigation

This investigation has been devised to generally comply with the relevant principles and requirements of BS10175:2001+A2:2017 "Investigation of potentially contaminated sites - Code of practice" and where directed by the principles and application rules of Eurocode 7 (EC7 – Part 1 and Part 2). The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

Boring, sampling and field test procedures are undertaken in accordance with BS5930:2015 "Code of Practice for Site Investigations". Likewise in-situ and laboratory testing complies with B.S.1377, "Methods of Tests for Soils for Civil Engineering Purposes", unless stated otherwise in the text.

The groundwater conditions entered on the boring records are those observed at the time of investigation. The normal rate of boring usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions.

Some items of the investigation have been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced for the benefit of the client alone. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

FACTUAL REPORT

ON A

GROUND INVESTIGATION

AT

LAND EAST OF DROVE LANE, YAPTON

1.0 TERMS OF REFERENCE AND INTRODUCTION

The work covered by this report was undertaken on behalf of Trustees of the Langmead Pension Scheme c/o Landlink Estates Ltd by Harrison Group Environmental Ltd (HGE). The work was undertaken in accordance with the relevant contract documentation and the Campbell Reith Hill LLP (Campbell Reith) Specification for Ground Investigation Tender Document Project (TET-13024-171018). Campbell Reith acted as Consulting Engineer.

The purpose of the investigation was to provide factual geotechnical and geo-environmental data from the fieldwork and subsequent laboratory testing which will be used to assist with the design for the development of the site.

This report presents the results of the fieldwork, associated laboratory testing and post fieldwork monitoring.

2.0 LOCATION AND DESCRIPTION OF SITE

The site is comprised of two adjoining agricultural fields located to the east of Drove Lane, Yapton, Arundel, West Sussex. The north eastern section of the site comprises two indentations around existing residential developments. The site is typically aligned north eastwards and has a total extent of some 12.90 hectares. It is centred on an approximate national grid reference of 497355, 103150 and the nearest postcode to site is BN18 0EB. It is proposed to develop the site with residential housing and associated landscaping and access.

A site location plan (GL22428A-DR001) is presented in Appendix A.

3.0 EXPECTED GEOLOGY

The site is predominantly underlain by Top Soil, with Made Ground up to 1.10mbgl locally, moving into River Terrace Deposits up to 4.70mbgl and in turn the Lewes Nodular Chalk Formation, observed up to 5.45mbgl.

4.0 FIELDWORK

The scope of the site works was generally in accordance with that proposed by Campbell Reith and comprised the following:

- Utility clearance of the exploratory locations (carried out by Midland Surveys Ltd)

ARUN DISTRICT COUNCIL Y/153/21/DOC

- Dynamic Continuous Sampling (Windowless Sampler) Boreholes (11 No. to maximum depth of 5.75mbgl)
- Hand Dug Percolation Testing Pits. (7 No. to depth of 0.50m)
- Gas and groundwater monitoring of installations (5 No. monthly rounds completed)
- Decommissioning of window sample boreholes

The main intrusive fieldwork was carried out by HGE between the 12th and 14th December 2018, Percolation testing was carried out between 25th – 28th March 2019 and the window sample holes were decommissioned on the 3rd April 2019. All exploratory locations are detailed on the appended drawing GL22428A - DR002 Rev B presented in Appendix A.

In addition to consulting all available service plans, lifting all available covers and prior to intrusive activities taking place, service clearance was carried out using Ground Penetrating Radar (GPR). Service inspection pits were also dug at borehole locations to clear near surface utilities.

The sampling strategy was designed by CampbellReith and took into account local site constraints, topography of the site, the geology encountered, including made ground and the development proposals.

During and immediately following completion of the fieldwork geotechnical samples were transported to Harrison Group Geotechnical Laboratory via in house transportation where, upon arrival, they were logged into a sample management system. Following receipt of the CampbellReith geotechnical schedules, certain geotechnical samples were subsequently dispatched to laboratory subcontractors via a courier.

4.1 Dynamic Continuous Sampling (Windowless Sampler) Boreholes

11 No. dynamic sampler boreholes, WS101 through to WS111 were drilled between 12th and 14th December 2018 using a dual-purpose tracked rig. Each position was progressed to a depth of between 4.90mbgl and 5.75mbgl, in order to identify, sample and test the underlying sub-soils.

Upon completion, WS202, WS208, WS210 and WS211 were installed with combined groundwater and gas monitoring wells (50mm), as summarised in Table 4.2. The remaining 7 holes (WS201, WS203, WS204, WS205, WS206, WS207 and WS209) were installed with 19mm groundwater monitoring wells as summarised in Table 4.2.

A detailed description of all the strata encountered, in-situ testing undertaken, position and types of samples taken along, with any groundwater observations made at the time of drilling are included on the dynamic sampling borehole records presented in Appendix B.

4.2 Percolation Testing

7 No. percolation tests were carried out between 25th and 28th of March 2019 and 1 further test on the 3rd of April. The tests were conducted in hand dug pits (PO201-PO207) in accordance with BS 6297:2007+A1:2008 at locations set out by the engineers (Campbell Reith Hill LLP) that were in turn GPS located and service cleared by an independent specialist.

The pits were dug to 0.50m bgl (0.30m x 0.30m LxW) then filled with water to ground level and allowed to drain completely to saturate the ground before the tests were carried out as specified in the relevant code of practice. Table 4.2 on the following page summarises the results.

ARUN DISTRICT COUNCIL Y/153/21/DOC

Test Type and Reference	Number	Results Average Vp of 3 tests (Vp = s/mm)	Comments / Limitations
Percolation test (BS 6297:2007:A1:2008)	7	12.39 – 62.91	Vp varied across the site with PO204, a relatively central position at the site, being the fastest to drain and PO201 at the southern boundary of the site being the slowest. All positions but PO204 fall within the acceptable Vp range of 15-100. Drainage field disposal should only be used when percolation tests indicate average values of Vp between 15 and 100 and the preliminary assessment of the trial hole is favorable. A value of 15 ensures untreated effluent cannot percolate too rapidly and potentially result in groundwater pollution. Where Vp is above 100 effective treatment is unlikely to take place in a drainage field and potentially cause ponding of wastewater due to insufficient soakage.

Table 4.2: Summary of Percolation tests

A detailed description of all the strata encountered, position and types of samples taken, along with any groundwater observations made at the time of digging are included on the hand dug trial pit records presented in Appendix B. Detailed results of the percolation tests are presented in Appendix E.

4.3 Installations

All boreholes were installed with standpipes for monitoring the gas and groundwater within the soils encountered. Table 4.2 below summarises these installations.

Monitoring Point I.D	Diameter of Installation (mm)	Base Depth of Installation (mbgl)	Response Zone (mbgl)	
			Top	Base
WS201	19	4.80	1.00	4.80
WS202	50	4.80	1.00	4.80
WS203	19	5.00	1.00	5.00
WS204	19	5.70	1.00	5.70
WS205	19	5.70	1.00	5.70
WS206	19	5.00	1.00	5.00
WS207	19	5.00	1.00	5.00
WS208	50	4.40	1.00	4.40
WS209	19	5.90	1.00	5.90
WS210	50	5.00	1.00	5.00
WS211	50	5.00	1.00	5.00

Table 4.3: Summary of Gas and Groundwater Installations.

Detailed descriptions of the installations and their corresponding backfill materials are included on the relevant exploratory borehole logs presented in Appendix B.

ARUN DISTRICT COUNCIL Y/153/21/DOC

4.4 Surveying

Pre-intrusive works were undertaken by an independent specialist who cleared proposed exploratory locations utilising a range of techniques including Ground Penetration Radar (GPR).

The service cleared locations were also surveyed in to establish the coordinates of all exploratory positions, the details of which are shown on the appropriate records presented in Appendix B.

4.5 Gas and Groundwater Monitoring

4 rounds of gas and groundwater monitoring have been undertaken on the HGE borehole installations on the following dates:

- Round 1 – 21st December 2018
- Round 2 – 8th January 2019
- Round 3 – 5th February 2019
- Round 4 – 6th March 2019
- Round 5 – 3rd April 2019

The results of the water strikes encountered during the intrusive works are detailed on the relevant logs presented in Appendix B. The standing groundwater water levels from the subsequent monitoring rounds detailed above are presented in Appendix C.

Gas monitoring was also undertaken on the above dates including one following a fall in atmospheric pressure (date to be confirmed). Concentrations of oxygen, methane, carbon dioxide, carbon monoxide and hydrogen sulphide were measured using a GA5000 land gas analyser. Concentrations of volatile organic compounds (VOCs) were monitored using a Tiger Particle Ionisation detector (PID). The results are presented in Appendix C.

5.0 GEOTECHNICAL TESTING

Use of the laboratory and field tests presented below to establish geotechnical parameters should be carried out in accordance with BS EN 1997-2 Eurocode Part 2.

5.1 In-Situ Testing

In-Situ testing was undertaken for geotechnical purposes and samples were obtained for appropriate laboratory analysis. Site based geotechnical testing is presented in the Appendix B and summarised below (Table 5.1).

Test Type and Reference	Number	Comments / Limitations
Standard penetration test (BS EN ISO 22476-3:2005)	56	Standard Penetration Tests (SPTs) display a general trend of increasing in value with depth below ground level. Non calibrated SPT hammers can result in a wide variance between reported results. It should be noted we report raw SPT N values rather than corrected $N_{(60)}$ values. However, calibration certificates are provided in Appendix F so as to enable $N_{(60)}$ values to be calculated if required.

Table 5.1: Summary of In-Situ Geotechnical Testing

The dynamic continuous sampler (windowless sampler) borehole SPT Hammer Test Report (SPT Hammer Ref: 382709 / 87.82%) are presented in Appendix F.

ARUN DISTRICT COUNCIL Y/153/21/DOC

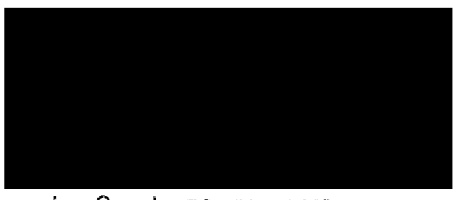
5.2 Geotechnical Laboratory Testing

Geotechnical laboratory testing scheduled by Campbell Reith on selected soil samples recovered from the exploratory holes, was carried out to identify the physical characteristics of the soils encountered. A summary of the results can be found Below (Table 5.2).

Test Type and Reference (BS 1377: 1990 unless stated)	No of tests	Results (Range)	Comments / Limitations
Water Content (BS EN ISO 17892-1: 2014)	24	17.9 - 32.8%	Determinations on disturbed samples, including those obtained from dynamic continuous sampler boreholes may not be wholly representative due to disturbance arising from the sampling process.
Liquid Limit (Part 2:5)	12	25 -43%	Only material passing a 425micron sieve is utilised. Therefore, the results may not be wholly representative of in-situ material.
Plastic Limit (Part 2:5)		15 - 22%	Determinations on disturbed samples, including those obtained from dynamic continuous sampler boreholes may not be wholly representative due to disturbance arising from the sampling process.
Particle size distribution - wet sieving (Part 2:9.3)	10	-	The recovery of an adequate mass of coarse-grained soils for particle distribution analysis can be difficult in boreholes. In obtaining such samples from cable tool boreholes it should also be noted that some loss of fine material generally occurs due to the nature of the sampling process.
Saturation Moisture Content	3	26.6 - 29%	The absence of suitable sized chalk 'lumps' limits the locations at which intact dry density tests can be performed, with more competent material being preferentially tested. 12 tests scheduled – 9 restricted due to above.
Intact Dry Density		1.51 - 1.57 mg/m^3	
pH	10	7.6 - 8.7	Determination of pH in soil by addition of water followed by automated electrometric measurement.
Water Soluble Sulphate	10	0.0073 - 0.015g/l	Determination of water-soluble sulphate by ICPOES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).
Acid Soluble Sulphate (Total)	10	0.020 - 0.044%	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.
Total Sulphur	10	0.006 - 0.015%	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.

Table 5.2: Summary of Geotechnical Laboratory Testing

Report Compiled by:



Joe Sparks BSc (Hons) MSc
Graduate Geotechnical Engineer

Report Checked by:



Martin Cooper BEng (Hons) FGS
Principal Engineer

ARUN DISTRICT COUNCIL Y/153/21/DOC

REFERENCES

BSI British Standard, BS5930:2015 "Code of Practice for Site Investigations".

BSI British Standard, BS1377:2016, "Methods of Test for Soils for Civil Engineering Purposes".

BS EN ISO 17892-1: 2014 Geotechnical investigation and testing. Laboratory testing of soil. Determination of water content.

BS EN 1997-1 Eurocode 7 Part 1 "General Rules"

BS EN 1997-2 Eurocode 7 Part 2 "Ground Investigation and Testing"

BS EN ISO 22475-1:2006 & 22475-2/3:2011 Geotechnical investigation and testing. Sampling methods and groundwater measurements.

BS EN ISO 22476:2005+A1:2011 Geotechnical investigation and testing. Various.

BS EN ISO 14688-2:2004 Geotechnical investigation and testing. Identification and classification of soil. Principles for a classification.

BS 6297:2007+A1:2008 "Code of practice for the design and installation of drainage fields for use in wastewater treatment".

BRE Special Digest 1:2005 Concrete in Aggressive Ground.

ARUN DISTRICT COUNCIL Y/153/21/DOC

LIST OF APPENDICES

APPENDIX A: DRAWINGS

Site Location Plan - GL22428A-DR001

Exploratory Location Plan – GL22428A-DR002 Rev B

APPENDIX B: EXPLORATORY HOLE RECORDS

Data Sheet: Site Investigation Methods

Key to Site Investigation Records

Dynamic Sampling (Windowless Sampler) Borehole Records

Hand Dug Trial Pit Records for Percolation Testing

APPENDIX C: GAS & GROUNDWATER MONITORING RECORDS

- Round 1 - 19th December 2018
- Round 1 – 21st December 2018
- Round 2 – 8th January 2019
- Round 3 – 5th February 2019
- Round 4 – 6th March 2019

APPENDIX D: LABORATORY TESTING

Geotechnical Laboratory Test Results

Summary of Restricted Tests

GL22428A-01 - Test Report Transmittal

GL22428A-02 – Test Report Tranmittal

19-24225-1 (i2 Analytical)

APPENDIX E: PERCOLATION TESTING

Percolation Testing Results

APPENDIX F: SPT HAMMER CERTIFICATES

SPT Hammer Certificates

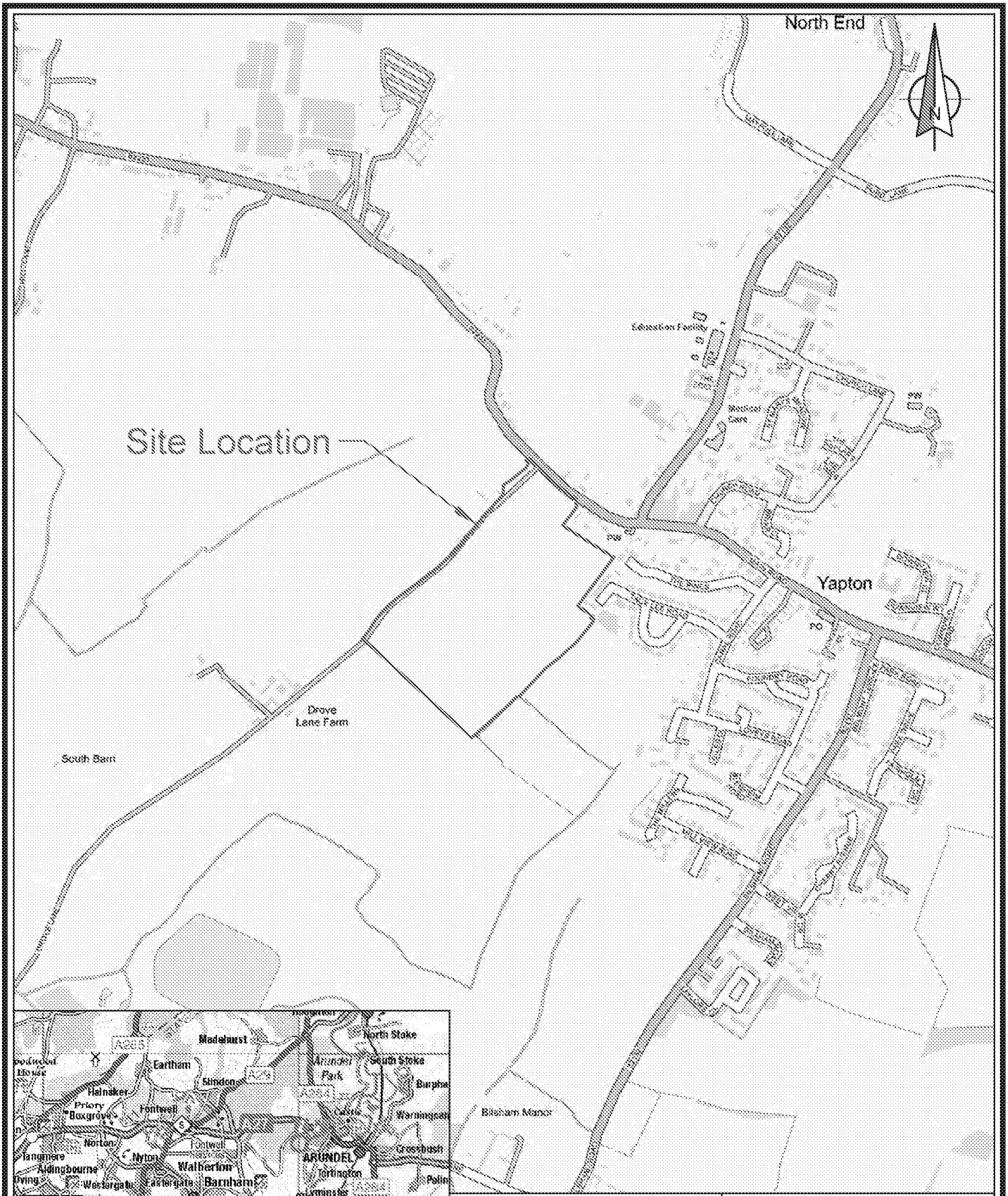
ARUN DISTRICT COUNCIL Y/153/21/DOC

APPENDIX A

DRAWINGS

ARUN DISTRICT COUNCIL Y/153/21/DOC

RM-Hr-D-104 Rev B N:\Norwich\Projects\London Jobs\22000 Jobs\GL22428\Drawings\CAD Files\GL22428A - DR001.dwg



Client : Trustees of the Langmead Pension Scheme	
Project : Drove Lane, Yapton	
Job No : GL22428	Date : December 2016
Drawing No : GL22428A - DR001	
Scale : 1:10000 @ A4	
Drawn by : CS	Checked by : IR
Eastings : 497347	Northings : 103144

Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office © Crown Copyright Harrison Group Environmental Ltd., Kimberley Street, Norwich, NR2 2RJ. AL100021199

THIS DRAWING IS THE PROPERTY OF HARRISON GROUP LIMITED AND NO REPRODUCTION MAY BE MADE IN WHOLE OR IN PART WITHOUT PERMISSION

harrisongroup ENVIRONMENTAL

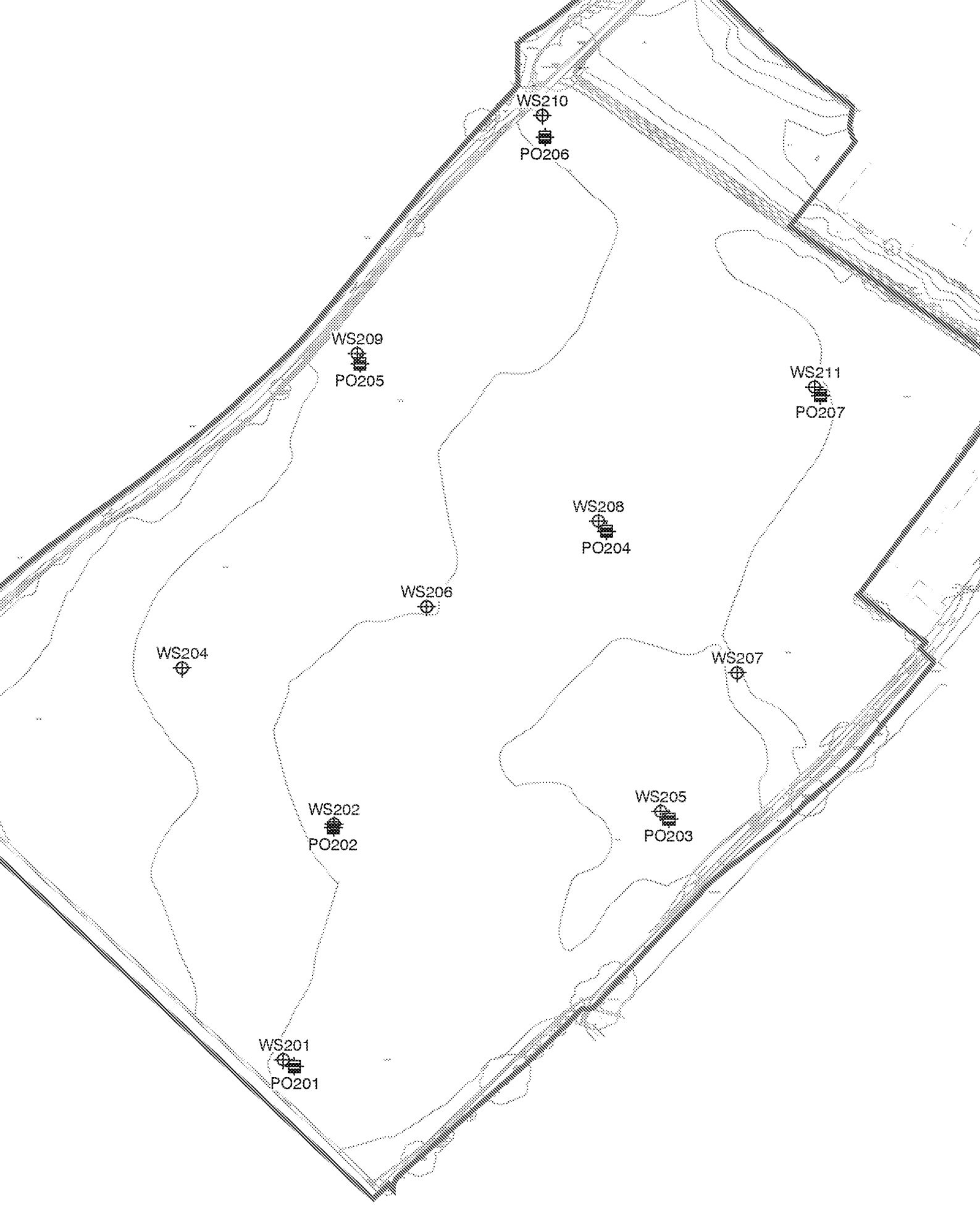
Norwich: 01603 613111 London: 020 7537 9233
Cambridge: 01223 781565 Laboratory: 01603 415333

Email: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

Certificate Number 5933
ISO 9001, ISO 14001

4031

ARUN DISTRICT COUNCIL Y/153/21/DOC



ARUN DISTRICT COUNCIL Y/153/21/DOC

Key :

Site Boundary

Notes :

APPENDIX B

EXPLORATORY HOLE RECORDS

ARUN DISTRICT COUNCIL Y/153/21/DOC

DATA SHEET: SITE INVESTIGATION METHODS

The following sheet provides basic details of the site investigation methods employed in the direct investigation phase of this report. Detailed method statements may be provided if requested or further information may be obtained from the relevant British Standard or Environment Agency publications. Prior to any excavation being undertaken, a surface sweep using a cable detector is undertaken, in order to avoid services. Details of the lithology encountered are generally presented on the relevant field record sheets, which also detail the type and depths of samples taken, the results of any in-situ tests, and any groundwater observations noted at the time. Other pertinent information may also be recorded.

DYNAMIC CONTINUOUS SAMPLING (WINDOW SAMPLER) BOREHOLES

The window sampler system comprises a series of varying diameter (100mm down to 36mm) steel tubes of either 1m length, and in the case of window (rather than windowless) having a slot or window cut along the side. The tubes are driven into the ground using a light percussive hammer attached to solid rods, and withdrawn by use of a jack. The hammer may be machine mounted (wheeled or tracked) or for restricted access work, hand held. The soil sample is forced up into the tube during the driving, samples being obtained directly through the slot or window, or in the case of windowless, in plastic liners in the steel tube. The sampler generally achieves depths of around 5m in favourable soils. Use of a super heavy tracked rig allows samples to be retrieved in liners to depths of up to 10m in suitable ground conditions.

Sampling can be carried out from the boreholes in accordance with BS EN ISO 22475-1:2006 and SPT testing can be undertaken in accordance with BS EN ISO 22476-3:2005+A1:2011. In addition, small diameter standpipes/monitoring wells can be installed to facilitate the sampling and monitoring of gas and groundwater.

MONITORING WELL INSTALLATIONS

All types of boreholes can be fitted with monitoring wells to enable subsequent sampling and monitoring of groundwater and ground gas levels. Monitoring wells are usually of upvc or hdpe material, although steel may also be used in certain circumstances. Various diameters are available from 19mm upwards, depending upon the size of the borehole. 38mm or 50mm diameter wells are the most commonly used. Wells generally have slotted lower sections which may have a geomesh filter and then are surrounded with a filter medium such as single sized gravel. The upper sections are generally solid casing which is usually grouted to produce a seal with the surrounding ground. The top of the well is generally fitted with a removable cap that may include a gas valve to enable future gas monitoring. The installation is usually protected by a lockable cover set in a concrete base. Details of monitoring well installations and associated backfill are given on the relevant borehole records.

GROUNDWATER MONITORING

Groundwater monitoring is undertaken using an electronic dip meter, which records the depth to water in a standpipe or monitoring well. Alternatively, down-hole pressure transducers can be utilised which can record variations over an extended period, which is particularly useful in monitoring variations due to tidal influences or when undertaking permeability tests or draw down tests or when undertaking soakaway testing. Where a non-aqueous phase liquid (e.g. floating hydrocarbon layer) is present, an interface meter is utilised to measure the thickness.

GROUND GAS MONITORING

Ground gas composition and flow monitoring may be undertaken where monitoring wells have been installed. Both flow (litres per hour) and composition (%) are measured using a portable infra-red multi-gas meter, calibrated for methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen. Records are also taken of atmospheric pressure, and relative pressure. The results are presented in the appendix of the report on the relevant records.

Ground gas monitoring can also be undertaken on a continuous basis using in-situ GasClam instrumentation where specific projects warrant accurate identification and quantification of the ground gas regime.

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS201

Sheet 1 of 1

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497263.14	N: 102944.85
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.93	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine to coarse brick and flint.		0.15	5.78	D1	0.10			
Soft orangish brown gravelly CLAY. Gravel is angular to subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=7 (1,1/2,1,1,3)	-	
				D3	1.00			
Loose becoming medium dense light orangish brown mottled white gravelly very clayey fine and medium SAND. Gravel is subangular to subrounded fine to coarse flint and chalk.		1.35	4.58					
				D4	1.50			
				SPT(C)	2.00	N=9 (0,1/1,2,2,4)	-	
				D5	2.00			
				D6	2.50			
From 2.70m: Becoming very gravelly.								
				SPT(C)	3.00	N=10 (1,1/2,2,3,3)	-	
				D7	3.00			
				D8	3.50			
Drilled through by SPT rod only. No recovery		4.00	1.93	SPT(C)	4.00	N=24 (4,4/5,7,7,5)	-	
				D9	4.00			
				SPT(C)	4.45	N=27 (5,4/5,8,7,7)	-	
Borehole completed at 4.90m.		4.90	1.03					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
13-12-2018	2.70			20	2.70	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.00m to 4.90m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. Installation: 19mm standpipe GL to 1.00m plain, 1.00m to 4.80m slotted, fitted with cap and tophat cover.
   Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 4.90m gravel.

[redacted]

Drilled by: S. Bellchambers | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS202

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497284.93	N: 103045.78
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.14	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown gravelly slightly organic CLAY. Gravel is angular to subrounded fine to coarse brick and flint.				D1	0.10			
		0.20	5.94					
Very soft orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=7 (1,1/1,1,2,3)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=11 (1,1/1,3,3,4)	-	
				D5	2.00			
		2.35	3.79					
Light brown locally mottled light grey sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint.				D6	2.50			
From 2.90m: Chalk present in gravel.				SPT(C)	3.00	N=11 (1,1/2,3,3,3)	-	
				D7	3.00			
				D8	3.50			
		3.85	2.29					
Light brown gravelly SILT. Gravel is angular to subrounded fine to coarse chalk and flint.				SPT(C)	4.00	N=18 (3,3/4,4,4,6)	-	
				D9	4.00			
				D10	4.50			
		4.65	1.49					
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint				D11	4.70			
				SPT(C)	4.80	N=54 (3,6/11,14,15,14)	-	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 4.80m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.25m gravel.

[redacted]

Drilled by: S. Bellchambers | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS202

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497284.93	N: 103045.78
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.14	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint fragments. (Grade Dc)		5.25	0.89					
Borehole completed at 5.25m.								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 4.80m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.25m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS203

Sheet 1 of 1

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497129.58	N: 103091.73
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 14/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 4.96	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is subangular to subrounded fine and medium brick and flint.		0.20	4.76	D1	0.10			
Soft orangish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=6 (1,1/1,1,2,2)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=8 (1,1/1,2,2,3)	-	
				D5	2.00			
Orangish brown mottled light grey very gravelly SILT. Gravel is angular to subrounded fine to coarse chalk and flint. *From 2.40m to 2.50m: Band of flint cobbles.*		2.15	2.81	D6	2.50			
Recovered as structureless CHALK composed of cream to white slightly gravelly SILT. Gravel is weak to moderately weak, medium density, white, angular to subrounded fine to coarse chalk. (Grade Dm)		2.90	2.06	SPT(C)	3.00	N=4 (0,0/0,1,1,2)	-	
				D7	3.00			
				D8	3.50			
Drilled through by SPT rod only. No recovery		4.00	0.96	SPT(C)	4.00	N=20 (1,1/2,5,7,6)	-	
				D9	4.00			
				SPT(C)	4.45	N=23 (4,5/6,6,5,6)	-	
Borehole completed at 5.00m.		5.00	-0.04					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
14-12-2018	3.40			20	2.20	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.00m to 5.00m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. [redacted]: 19mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with cap and tophat cover.
4. [redacted] to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.00m gravel.

[redacted]

Drilled by: S. Bellchambers | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS204

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497219.84	N: 103112.59
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.67	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL. Very soft brown slightly gravelly CLAY. Gravel is subangular to rounded fine and medium flint.		0.15	5.52	D1	0.10			
Soft orangish brown slightly gravelly CLAY. Gravel is subangular to rounded coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=5 (1,1/1,1,1,2)	-	
				D3	1.00			
				D4	1.50			
Light orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine and medium chalk and flint.		1.55	4.12					
				SPT(C)	2.00	N=10 (1,1/2,2,3,3)	-	
				D5	2.00			
				D6	2.50			
Soft orangish brown mottled grey slightly sandy CLAY with occasional gravel of subangular to subrounded fine flint.		2.55	3.12					
				SPT(C)	3.00	N=0 (0,0/0,0,0,0)	-	
				D7	3.00			
				D8	3.50			
Medium dense orangish brown mottled grey slightly gravelly fine and medium SAND. Gravel is subangular to subrounded fine flint.		3.80	1.87					
From 4.10m: Becoming very gravelly. Chalk present in gravel.				SPT(C)	4.00	N=17 (1,1/2,3,4,8)	-	
				D9	4.00			
				D10	4.40			
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint		4.60	1.07					
				D11	4.70			
		4.80	0.87	SPT(C)	4.80	N=27 (3,4/4,5,6,12)	-	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
					3.60	No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.80m to 5.75m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. Installation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.70m slotted, fitted with cap and tophat cover. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.75m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS204

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497219.84	N: 103112.59
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.67	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint fragments. (Grade Dc)				SPT(C)	5.30	N=38 (12,11/10,9,9,10)	-	
Drilled through by SPT rod only. No recovery								
Borehole completed at 5.75m.		5.75	-0.08					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
					3.60	No groundwater encountered

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.80m to 5.75m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.

[redacted]nstallation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.70m slotted, fitted with cap and tophat cover.
[redacted]ackfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.75m gravel.

[redacted]gged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS205

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497424.84	N: 103051.23
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.68	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine and medium brick and flint.		0.15	6.53	D1	0.10			
Very soft orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=8 (1,1/1,2,2,3)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=4 (1,2/1,1,1,1)	-	
				D5	2.00			
Light brown slightly sandy slightly gravelly SILT. Gravel is angular to subrounded fine and medium flint.		2.10	4.58	D6	2.50			
Medium dense brown mottled light grey very silty gravelly fine and medium SAND. Gravel is angular to subrounded fine to coarse chalk and flint.		2.90	3.78	SPT(C)	3.00	N=16 (1,1/2,3,5,6)	-	
				D7	3.00			
				D8	3.50			
				SPT(C)	4.00	N=22 (3,5/6,6,5,5)	-	
				D9	4.00			
				D10	4.50			
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint		4.65	2.03					
		4.80	1.88	SPT(C)	4.80	N=30 (7,7/8,7,7,8)	-	
				D11	4.80			

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
13-12-2018	3.60			20	3.60	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.80m to 5.75m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. Installation: 19mm standpipe GL to 1.50m plain, 1.50m to 5.70m slotted, fitted with cap and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.50m bentonite pellets, 1.50m to 5.75m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS205

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497424.84	N: 103051.23
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.68	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white silty GRAVEL. Clasts are moderately weak, low density, white, angular to subangular fine to coarse chalk with frequent flint fragments. (Grade Dc)				SPT(C)	5.30	N=46 (10,10/11,13,11,11)	-	
Drilled through by SPT rod only. No recovery								
Borehole completed at 5.75m.		5.75	0.93					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	4.80	0.80	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
13-12-2018	3.60			20	3.60	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.80m to 5.75m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.

[redacted]on: 19mm standpipe GL to 1.50m plain, 1.50m to 5.70m slotted, fitted with cap and tophat cover.
GL to 0.20m concrete, 0.20m to 1.50m bentonite pellets, 1.50m to 5.75m gravel.

Drilled by: S. Bellchambers | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS206

Sheet 1 of 1

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497324.61	N: 103138.85
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.90	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic clayey SILT. Gravel is subangular to subrounded fine brick and flint.				D1	0.10			
Very soft brown to orangish brown slightly sandy CLAY with rare gravel of subrounded fine flint.		0.20	5.70	B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=5 (1,1/1,1,1,2)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=3 (0,0/0,1,1,1)	-	
				D5	2.00			
				D6	2.50			
Brown locally mottled light grey gravelly SILT. Gravel is subangular to subrounded fine to coarse flint.		2.80	3.10	SPT(C)	3.00	N=0 (0,0/0,0,0,0)	-	
				D7	3.00			
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, low density, cream to white, angular to subrounded fine to coarse chalk with flint fragments. (Grade Dm)		3.30	2.60	D8	3.50			
Drilled through by SPT rod only. No recovery		4.00	1.90	D9	4.00			
Borehole completed at 5.00m.		5.00	0.90					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	3.20			20	2.40	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod continuously drilled from 4.00m to 5.00m to allow installation of 19mm standpipe.
3. Installation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with cap and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.00m gravel.

[redacted]

Drilled by: S. Betchambers | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS207

Sheet 1 of 1

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497457.58	N: 103110.55
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 13/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.44	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine and coarse brick and flint.				D1	0.10			
		0.25	6.19					
Soft orangish brown slightly sandy CLAY with rare gravel of subangular to subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=5 (1,1/1,1,2,1)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=2 (0,0/1,0,1,0)	-	
				D5	2.00			
Brown locally mottled light grey gravelly SILT. Gravel is subangular to subrounded fine to coarse flint.		2.40	4.04					
From 2.80m: Chalk present in gravel.				D6	2.50			
				SPT(C)	3.00	N=6 (0,1/1,1,3,1)	-	
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak to moderately weak, low density, white, angular to subrounded fine to coarse chalk with flint fragments. (Grade Dm)		3.10	3.34	D7	3.00			
				D8	3.50			
Drilled through by SPT rod only. No recovery		4.00	2.44	SPT(C)	4.00	N=16 (3,3/3,4,5,4)	-	
				D9	4.00			
				SPT(C)	4.50	N=10 (4,4/3,3,2,2)	-	
				D10	4.50			
				D11	4.80			
Borehole completed at 5.00m.		5.00	1.44					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
13-12-2018	3.20			20	2.90	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 4.00m to 5.00m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.

[redacted]lation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with cap and tophat cover.
[redacted]fill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.00m gravel.

[redacted]ed by: S. Beechambers | [redacted]ed by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS208

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497398.15	N: 103175.52
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.06	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine and medium brick and flint.		0.15	5.91	D1	0.10			
Very soft orangish brown slightly sandy CLAY.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=10 (1,1/2,2,3,3)	-	
				D3	1.00			
Loose becoming medium dense brown to orangish brown slightly gravelly slightly clayey fine SAND. Gravel is angular to subrounded fine to coarse flint.		1.40	4.66	D4	1.50			
				SPT(C)	2.00	N=7 (1,1/1,1,2,3)	-	
				D5	2.00			
				D6	2.50			
				SPT(C)	3.00	N=16 (3,3/3,4,4,5)	-	
				D7	3.00			
Light brown mottled light grey gravelly SILT. Gravel is subangular to subrounded fine and medium flint and chalk.		3.40	2.66	D8	3.50			
				SPT(C)	4.00	N=36 (2,2/3,8,12,13)	-	
				D9	4.00			
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, low density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)		4.35	1.71	D10	4.50			
				SPT(C)	4.60	N=40 (8,10/10,9,9,12)	-	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	3.90			20	3.80	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole collapsed from 5.05m to 4.40m following SPT test.
3. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 4.40m slotted, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 4.40m gravel, 4.40m to 5.05m arisings.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL 1/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS208

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497398.15	N: 103175.52
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.06	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, low density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)		5.05	1.01					
Borehole completed at 5.05m.								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	3.90			20	3.80	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Hole collapsed from 5.05m to 4.40m following SPT test.
3. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 4.40m slotted, fitted with gas tap, bung and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 4.40m gravel, 4.40m to 5.05m arisings.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DIST

Dynamic Continuous Sampling Borehole Record

WS209 | Sheet 1 of 2

harrisongroup ENVIRONMENTAL

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497294.83	N: 103247.25
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 14/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.66	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine to coarse brick and flint.				D1	0.10			
Soft orangish brown slightly gravelly CLAY. Gravel is subangular to subrounded fine and medium flint.		0.20	5.46	B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=6 (1,1/1,1,2,2)	-	
				D3	1.00			
From 1.45m to 1.64m: Band of dark orangish brown slightly clayey gravelly fine and medium sand. Gravel is subangular to subrounded fine flint.				D4	1.50			
				SPT(C)	2.00	N=6 (0,0/0,1,3,2)	-	
				D5	2.00			
				D6	2.50			
Light grey mottled light brown very gravelly SILT. Gravel is angular to subrounded fine to coarse chalk and flint.		2.80	2.86					
				SPT(C)	3.00	N=8 (2,2/1,2,3,2)	-	
				D7	3.00			
				D8	3.50			
				SPT(C)	4.00	N=3 (0,0/0,1,1,1)	-	
				D9	4.00			
Recovered as structureless CHALK composed of cream to off-white gravelly SILT. Gravel is weak to moderately weak, low density, off-white, subangular to subrounded fine to coarse chalk with flint fragments. (Grade Dm)		4.10	1.56					
				D10	4.50			
		5.00	0.66	SPT(C)	5.00	N=20 (2,5/4,5,6,5)	-	
				D11	5.00			

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
14-12-2018	4.10			20	4.10	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 5.00m to 5.90m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. Installation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.90m slotted, fitted with cap and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.90m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DI

Dynamic Continuous Sampling Borehole Record

WS209 | Sheet 2 of 2

harrisongroup ENVIRONMENTAL

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497294.83	N: 103247.25
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 14/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 5.66	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Drilled through by SPT rod only. No recovery				SPT(C)	5.45	N=20 (4,4/4,6,6,4)	-	
Borehole completed at 5.90m.		5.90	-0.24					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
14-12-2018	4.10			20	4.10	

Remarks:

1. Inspection pit from GL to 1.20m.
2. SPT rod drilled from 5.00m to 5.90m to allow installation of 19mm standpipe. Two SPT tests detailed for the continuous depth drive.
3. Installation: 19mm standpipe GL to 1.00m plain, 1.00m to 5.90m slotted, fitted with cap and tophat cover.
4. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.90m gravel.

[redacted]

Dril | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS210

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497374.11	N: 103349.24
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.04	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Soft brown slightly gravelly slightly organic CLAY. Gravel is subangular to subrounded fine brick and flint.				D1	0.20			
		0.25	5.79					
Very soft orangish brown slightly sandy CLAY with rare gravel of subrounded fine to coarse flint.				B1	0.50			
				D2	0.50			
				SPT(C)	1.00	N=5 (1,1/1,1,2,1)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=4 (0,0/1,1,1,1)	-	
				D5	2.00			
				D6	2.50			
Loose orangish brown mottled white gravelly fine to coarse SAND. Gravel is angular to subrounded fine and medium flint and chalk. Locally a slightly sandy slightly gravelly clay.		2.95	3.09	SPT(C)	3.00	N=8 (1,1/2,2,2,2)	-	
				D7	3.00			
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, medium density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)		3.40	2.64	D8	3.50			
				SPT(C)	4.00	N=6 (0,0/1,2,1,2)	-	
				D9	4.00			
				D10	4.50			
				SPT(S)	5.00	N=26 (4,4/5,6,7,8)	-	
				D11	5.00			
				D12	5.00 - 5.45			

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	3.60			20	3.50	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.45m gravel.

[redacted]

D | Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTR

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS210

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497374.11	N: 103349.24
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.04	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, medium density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)								
		5.45	0.59					
Borehole completed at 5.45m.								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	3.60			20	3.50	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.45m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS211

Sheet 1 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497490.76	N: 103232.89
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.35	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND. Very soft brown slightly gravelly slightly organic CLAY. Gravel is angular to subrounded fine and medium brick and flint.		0.25	6.10	B1	0.20			
				D1	0.20			
Very soft brown slightly sandy CLAY with rare gravel of angular to subangular flint.				D2	0.50			
				SPT(C)	1.00	N=6 (1,1/1,1,2,2)	-	
				D3	1.00			
				D4	1.50			
				SPT(C)	2.00	N=3 (1,0/1,0,1,1)	-	
				D5	2.00			
Soft orangish brown slightly sandy CLAY.		2.20	4.15					
				D6	2.50			
Orangish brown slightly sandy gravelly CLAY. Gravel is angular to subrounded medium and coarse flint.		2.65	3.70					
				SPT(C)	3.00	N=11 (2,2/2,3,3,3)	-	
				D7	3.00			
				D8	3.50			
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, low density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)		3.60	2.75					
				SPT(C)	4.00	N=4 (1,1/1,1,1,1)	-	
				D9	4.00			
				D10	4.50			
				SPT(S)	5.00	N=26 (2,3/4,7,7,8)	-	
				D11	5.00			
				D12	5.00 - 5.45			

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	4.50			20	3.30	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.45m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DIS

harrisongroup ENVIRONMENTAL

Dynamic Continuous Sampling Borehole Record

WS211

Sheet 2 of 2

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497490.76	N: 103232.89
Location: Land East of Drove Lane, Yapton	Consultant: Harrison Group Environmental Ltd	Date: 12/12/2018	
	Plant used: Premier Tracked 110 Rig	SPT Hammer Serial No: 382709 (ER: 88%)	

Geology Description	Legend	Depth (m)	Elevation (maOD) 6.35	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Recovered as structureless CHALK composed of cream to white gravelly SILT. Gravel is weak, low density, cream to white, angular to subangular fine to coarse chalk with flint fragments. (Grade Dm)								
		5.45	0.90					
Borehole completed at 5.45m.								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	1.20	2.00	0.80	100
75	2.00	3.00	1.00	100
65	3.00	4.00	1.00	100
55	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
12-12-2018	4.50			20	3.30	

Remarks:

1. Inspection pit from GL to 1.20m.
2. Installation: 50mm standpipe GL to 1.00m plain, 1.00m to 5.00m slotted, fitted with gas tap, bung and tophat cover.
3. Backfill: GL to 0.20m concrete, 0.20m to 1.00m bentonite pellets, 1.00m to 5.45m gravel.

[redacted]

Logged by: I. Reid | Checked by: M. Cooper | Fm-Hn-R-3068-Rev C

ARUN DISTRICT COUNCIL Y/153/21/DOC

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO201

Sheet 1 of 1

Project ID:	**GL22428A**	Client:	Trustees of the Langmead Pension Scheme	E: 497267.88	N: 102941.97
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD) 6.06	Sample / In-Situ Test Information: Type	Sample / In-Situ Test Information: Depth	Sample / In-Situ Test Information: Results / Remarks	Installation & Backfill
TOPSOIL. Soft light brown CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets present.				B1 D1	0.15 0.15		
Very soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Rare rootlets present.		0.25	5.81				
Trial pit terminated at 0.50m.		0.50	5.56				

PREVIEW

Weather:	Sunny and dry
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks | Checked by: M. Cooper | Fm-Hn-R-3069-Rev E

ARUN D

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO202

Sheet 1 of 1

Project ID:	**GL22428A**	Client:	Trustees of the Langmead Pension Scheme	E: 497284.68	N: 103044.20
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
			6.22	Type	Depth	Results / Remarks	
TOPSOIL. Soft light brown CLAY. Occasional rootlets present.							
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Rare rootlets present.		0.20	6.02	B1 D1	0.30 0.30		
Trial pit terminated at 0.50m.		0.50	5.72				

PREVIEW

Weather:	Sunny and dry	Water Strike			
Pit Stability:	Stable	Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
Shoring Used:						No groundwater encountered
Pit Dimensions:	L: 0.30m x W: 0.30m					

Remarks

1. Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks | Checked by: M. Cooper | Fm-Hn-R-3069-Rev E

ARUN D

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO203

Sheet 1 of 1

Project ID:	**GL22428A**	Client:	Trustees of the Langmead Pension Scheme	E: 497428.35	N: 103047.90
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
			6.80	Type	Depth	Results / Remarks	
TOPSOIL. Soft light brown CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets present.							
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Rare rootlets present.		0.20	6.60				
				B1	0.40		
				D1	0.40		
Trial pit terminated at 0.50m.		0.50	6.30				

PREVIEW

Weather:	Sunny and dry
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks	Checked by: M. Cooper	Fm-Hn-R-3069-Rev E

ARU

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO204

Sheet 1 of 1

Project ID:	**GL22428A**	Client:	Trustees of the Langmead Pension Scheme	E: 497401.65	N: 103171.13
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD) 6.11	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Installation & Backfill
TOPSOIL. Soft light brown CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets present.							
		0.15	5.96				
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint.				B1 D1	0.30 0.30		
		0.50	5.61				
Trial pit terminated at 0.50m.							

PREVIEW

Weather:	Sunny and dry
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks	Checked by: M. Cooper	Fm-Hn-R-3069-Rev E

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO205

Sheet 1 of 1

Project ID: **GL22428A**	Client: Trustees of the Langmead Pension Scheme	E: 497296.02	N: 103242.85
Location: Drove Lane, Yapton	Consultant: Campbell Reith Hill LLP		
	Plant used: Hand Excavated	Date: 25/03/2019	

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
			5.65	Type	Depth	Results / Remarks	
TOPSOIL. Soft light brown CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets present.							
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint.		0.20	5.45	B1 D1	0.30 0.30		
Trial pit terminated at 0.50m.		0.50	5.15				

PREVIEW

Weather: Sunny and dry	Water Strike
Pit Stability: Stable	Date / Water Strike (m) / Time Elapsed (mins) / Standing Level (m) / Remarks: No groundwater encountered
Shoring Used:	
Pit Dimensions: L: 0.30m x W: 0.30m	

Remarks

1. Backfill: GL to 0.50m arisings.

Logged by: J. Sparks | Checked by: M. Cooper | Fm-Hn-R-3069-Rev E

[redacted]

ARUN D

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO206

Sheet 1 of 1

Project ID:	GL22428A	Client:	Trustees of the Langmead Pension Scheme	E: 497375.25	N: 103339.92
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
			5.98	Type	Depth	Results / Remarks	
Very soft to soft brown CLAY. Locally slightly gravelly. Gravel is subangular to subrounded fine to coarse chalk. Occasional rootlets present.				B1 D1	0.20 0.20		
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint.		0.30	5.68				
Trial pit terminated at 0.50m.		0.50	5.48				

PREVIEW

Weather:	Sunny and dry
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

1. Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks | Checked by: M. Cooper | Fm-Hn-R-3069-Rev E

ARUN DISTRICT COUNCIL 1/153/21/DOC

harrisongroup ENVIRONMENTAL

Trial Pit Record

PO207

Sheet 1 of 1

Project ID:	**GL22428A**	Client:	Trustees of the Langmead Pension Scheme	E: 497493.25	N: 103229.21
Location:	Drove Lane, Yapton	Consultant:	Campbell Reith Hill LLP		
		Plant used:	Hand Excavated	Date:	25/03/2019

Geology Description	Legend	Depth	Elevation (maOD)	Sample / In-Situ Test Information			Installation & Backfill
			6.47	Type	Depth	Results / Remarks	
TOPSOIL. Soft light brown CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint. Occasional rootlets present.							
		0.15	6.32				
Soft orangish brown slightly sandy CLAY. Locally slightly gravelly. Gravel is angular to subrounded fine to coarse flint.				B1 D1	0.30 0.30		
		0.50	5.97				
Trial pit terminated at 0.50m.							

PREVIEW

Weather:	Sunny and dry
Pit Stability:	Stable
Shoring Used:	
Pit Dimensions:	L: 0.30m x W: 0.30m

Water Strike

Date	Water Strike (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
				No groundwater encountered

Remarks

Backfill: GL to 0.50m arisings.

[redacted]

Logged by: J. Sparks | Checked by: M. Cooper | Fm-Hn-R-3069-Rev E

ARUN DISTRICT COUNCIL Y/153/21/DOC

APPENDIX C

GAS & GROUNDWATER MONITORING RECORDS

ARUN DISTRICT COUNCIL Y/153/21/DOC

ARUN DISTRICT COUNCIL Y/5321/DOC

harrisongroup ENVIRONMENTAL

Gas and PID Monitoring Results

Project ID:	GL22428A	Client:	Trustees of the Langmead Pension Scheme	Equipment	Model / Serial Number	Manufacturer's Calibration Date
Date:	21/12/2018 - 08/01/2019	Location:	Land East of Drove Lane, Yapton	Gas Analyser:	GA5000 / 501752	22/05/2019
Weather conditions:	Clear, Overcast			PID:	Tiger Handheld VOC Detector / L-112924	11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.		
Field engineer(s):	S. Hedges/ I. Reid	Remarks:				

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)
WS202	PIPE1 (50mm)	21/12/2018	11:00:00	9.0	1005	1008	998	999	28.9			0.2	0.2	1.0	0.0	21.4	10.0	0.0	6.3
			11:00:15									0.2			0.5	19.9	10.0		6.3
			11:00:30									0.1			0.5	18.5	10.0		5.5
			11:00:45									0.2			0.5	18.4	10.0		5.5
			11:01:00									0.2			0.5	18.4	10.0		5.4
			11:01:30									0.2			0.5	18.4	10.0		5.4
			11:02:00									0.1			0.5	18.4	10.0		5.4
			11:03:00									0.1			0.5	18.4	10.0		5.4
		08/01/2019	13:45:00	10.0	1033	1026	1010	1026	0.1			0.2	0.2	1.0	0.1	21.8	0.0	0.0	0.0
			13:45:15									0.2			1.1	18.8	0.0	0.0	0.0
			13:45:30									0.1			1.2	15.2	0.0	0.0	0.0
			13:45:45									0.1			1.2	14.9	0.0	0.0	0.0
			13:46:00									0.1			1.1	14.9	0.0	0.0	0.0
			13:46:30									0.1			1.1	14.9	0.0	0.0	0.0
			13:47:00									0.1			1.1	14.9	0.0	0.0	0.0
			13:48:00									0.1			1.1	14.9	0.0	0.0	0.0
WS208	PIPE1 (50mm)	21/12/2018	10:00:00	8.0	1005	1007	998	999	0.0	0.3	0.1	0.2	0.2	1.0	0.1	20.7	0.0	0.0	-0.1
			10:00:15							0.4	0.1	0.2			0.1	21.0	0.0		-0.1
			10:00:30							0.3	0.1	0.2			0.1	21.1	0.0		-0.1
			10:00:45							0.2	0.1	0.2			0.1	21.2	0.0		-0.1
			10:01:00							0.2	0.1	0.2			0.1	21.2	0.0		-0.1
			10:01:30							0.1	0.1	0.2			0.1	21.2	0.0		-0.1
			10:02:00							0.1	0.1	0.2			0.0	21.2	0.0		-0.1
			10:03:00							0.1	0.1	0.2			0.0	21.2	0.0		-0.1
		08/01/2019	14:30:00	10.0	1033	1025	1010	1027	0.0			0.2	0.2	1.0	0.0	22.1	0.0	0.0	0.0
			14:30:15									0.2			1.1	20.1	0.0	0.0	0.0
			14:30:30									0.2			1.1	17.6	0.0	0.0	0.0
			14:30:45									0.2			1.1	17.4	0.0	0.0	0.0
			14:31:00									0.2			1.1	17.4	0.0	0.0	0.0
			14:31:30									0.2			1.1	17.3	0.0	0.0	0.0
			14:32:00									0.2			1.1	17.2	0.0	0.0	0.0
			14:33:00									0.2			1.1	17.2	0.0	0.0	0.0
WS210	PIPE1 (50mm)	21/12/2018	09:30:00	8.0	1005	1007	998	999	-0.2	0.4	0.0	0.2	0.2	1.0	0.0	20.9	2.0	0.0	-0.1
			09:30:15							0.3	0.0	0.2			0.5	20.0	3.0		-0.1
			09:30:30							0.2	0.0	0.2			0.5	17.4	4.0		-0.1
			09:30:45							0.0	0.0	0.2			0.5	17.3	4.0		-0.1
			09:31:00							0.0	0.0	0.2			0.5	17.3	4.0		-0.1
			09:31:30							0.0	0.0	0.2			0.4	17.7	4.0		-0.1
			09:32:00							0.0	0.0	0.2			0.4	17.8	4.0		-0.1
			09:33:00							0.0	0.0	0.2			0.4	17.5	4.0		-0.1
		08/01/2019	12:00:00	9.0	1033	1026	1010	1026	0.0			0.2	0.2	1.0	0.0	21.1	0.0	0.0	0.0
			12:00:15									0.2			1.3	18.3	0.0	0.0	0.0
			12:00:30									0.2			1.3	12.2	0.0	0.0	0.0
			12:00:45									0.2			1.3	11.5	0.0	0.0	0.0
			12:01:00									0.2			1.3	11.4	0.0	0.0	0.0
			12:01:30									0.2			1.3	11.3	0.0	0.0	0.0
			12:02:00									0.2			1.3	11.2	0.0	0.0	0.0
			12:03:00									0.2			1.3	11.2	0.0	0.0	0.0

ARUN DISTRICT COUNCIL Y/5321/DOC

harrisongroup ENVIRONMENTAL

Gas and PID Monitoring Results

Project ID:	GL22428A	Client:	Trustees of the Langmead Pension Scheme	Equipment	Model / Serial Number / Manufacturer's Calibration Date
Date:	21/12/2018 - 08/01/2019	Location:	Land East of Drove Lane, Yapton	Gas Analyser:	GA5000 / 501752 — 22/05/2019
Weather conditions:	Clear, Overcast			PID:	Tiger Handheld VOC Detector / L-112924 — 11/10/2019
Pump Running Time (Purge): Standard 30 secs. Pump Running Time (Sampling): Standard 180 secs. Flow Details: 5 sec average for 1 min.				PID Details: "<" indicates reading is under the detection limit. ">" indicates reading is over the upper limit. "*" level to be determined.	
Field engineer(s):	S. Hedges/ I. Reid	Remarks:			

Location ID	Monitoring Pipe and Diameter	Date Monitored	Time	Air Temp (°C)	Atmospheric Pressure 48Hrs Prior to Sampling (mB)	Atmospheric Pressure 24Hrs Prior to Sampling (mB)	Atmospheric Pressure 3Hrs Prior to Sampling (mB)	Atmospheric Pressure When Sampled (mB)	Relative Pressure (mB)	Peak PID (ppm)	Stable PID (ppm)	Methane (%)	Peak Methane (%)	Methane LEL (%)	Carbon Dioxide (%)	Oxygen (%)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow (l/hr)
WS211	PIPE1 (50mm)	21/12/2018	09:45:00	8.0	1004	1007	998	999	-0.1	0.0	0.0	0.2	0.2	1.0	0.4	18.2	0.0		0.0
			09:45:15							0.1	0.0	0.2			0.3	19.3	0.0		0.0
			09:45:30							0.3	0.0	0.2			0.2	19.5	0.0		0.0
			09:45:45							0.1	0.0	0.2			0.2	19.9	0.0		0.0
			09:46:00							0.0	0.0	0.2			0.1	20.0	0.0		0.0
			09:46:30							0.0	0.0	0.2			0.1	20.8	0.0		0.0
			09:47:00							0.0	0.0	0.2			0.1	20.8	0.0		0.0
			09:48:00							0.0	0.0	0.2			0.1	20.5	0.0		0.0
		08/01/2019	12:45:00	10.0	1033	1026	1010	1026	0.3			0.2	0.2	1.0	0.1	21.3	0.0	0.0	0.0
			12:45:15									0.2			0.4	19.9	0.0	0.0	0.0
			12:45:30									0.2			0.4	18.2	0.0	0.0	0.0
			12:45:45									0.2			0.3	18.4	0.0	0.0	0.0
			12:46:00									0.2			0.3	18.7	0.0	0.0	0.0
			12:46:30									0.2			0.3	19.0	0.0	0.0	0.0
			12:47:00									0.2			0.3	19.0	0.0	0.0	0.0
			12:48:00									0.2			0.3	19.0	0.0	0.0	0.0