

NOTES

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8. The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
9. The contractor must comply with all current legislation relating to health & safety.
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11. Contractor to confirm all invert levels where connections are proposed prior to commencing any drainage works. Contractor to commence drainage works at the point of discharge.

Rev.	Date	Amendments	Drawn	Appr.
A	08/02/2020	Service margins provided in permeable paving	SPB	MJA
-	28/01/2020	Original Issue	SPB	MJA



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Tel: 01243 210418 Fax: 01483 861682 www.rgp.co.uk

Client
Persimmon Homes

Project
Land at West Somtpting Phase 1

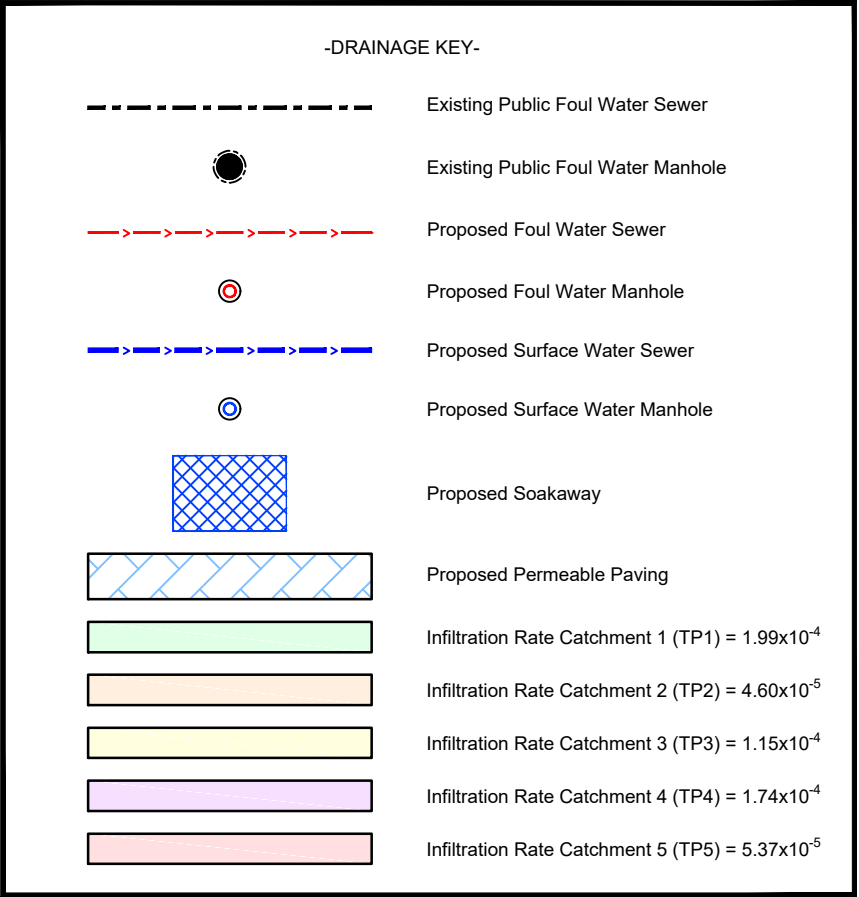
Drawing Title
Drainage Strategy (Sheet 3 of 3)

Scale	Drawn By	Checked By	Approved By
1:500	SPB	MJA	MJA
Date	Drawing No.		Rev.
June 2020	D1358-SK302		A

PLANNING

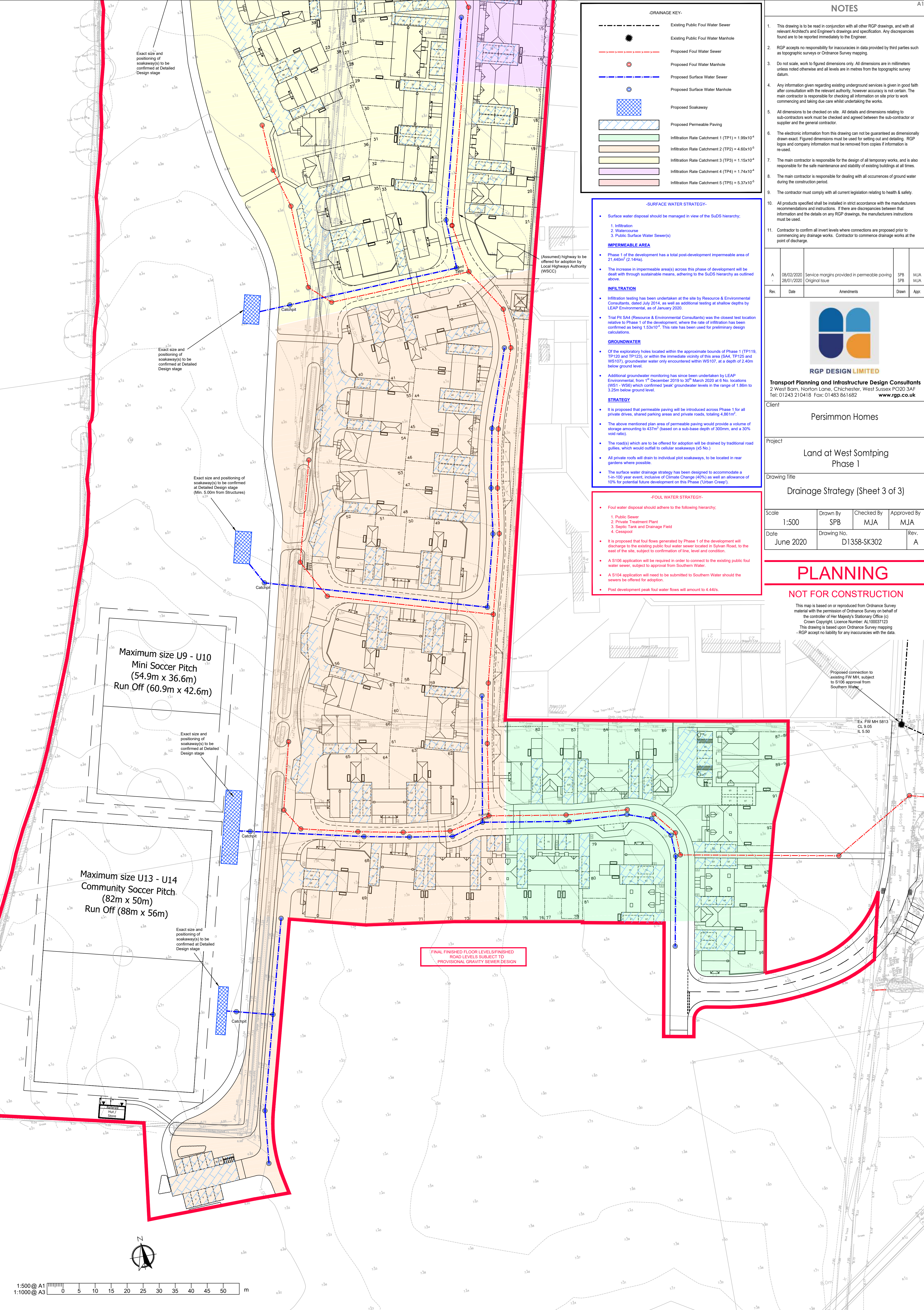
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- SURFACE WATER STRATEGY-**
- Surface water disposal should be managed in view of the SuDS hierarchy:
 1. Infiltration
 2. Watercourse
 3. Public Surface Water Sewer(s)
- IMPERMEABLE AREA**
- Phase 1 of the development has a total post-development impermeable area of 21,440m² (2.14Ha).
 - The increase in impermeable area(s) across this phase of development will be dealt with through sustainable means, adhering to the SuDS hierarchy as outlined above.
- INFILTRATION**
- Infiltration testing has been undertaken at the site by Resource & Environmental Consultants, dated July 2014, as well as additional testing at shallow depths by LEAP Environmental, as of January 2020.
 - Trial Pit SA4 (Resource & Environmental Consultants) was the closest test location relative to Phase 1 of the development, where the rate of infiltration has been confirmed as being 1.53×10^{-4} . This rate has been used for preliminary design calculations.
- GROUNDWATER**
- Of the exploratory holes located within the approximate bounds of Phase 1 (TP119, TP120 and TP123), or within the immediate vicinity of this area (SA4, TP125 and WS107), groundwater water only encountered within WS107, at a depth of 2.40m below ground level.
 - Additional groundwater monitoring has since been undertaken by LEAP Environmental, from 1st December 2019 to 30th March 2020 at 6 No. locations (WS1 - WS6) which confirmed 'peak' groundwater levels in the range of 1.86m to 3.25m below ground level.
- STRATEGY**
- It is proposed that permeable paving will be introduced across Phase 1 for all private drives, shared parking areas and private roads, totaling 4.86m².
 - The above mentioned plan area of permeable paving would provide a volume of storage amounting to 437m³ (based on a sub-base depth of 300mm, and a 30% void ratio).
 - The road(s) which are to be offered for adoption will be drained by traditional road gullies, which would outfall to cellular soakaways (x5 No.).
 - All private roofs will drain to individual plot soakaways, to be located in rear gardens where possible.
 - The surface water drainage strategy has been designed to accommodate a 1-in-100 year event, inclusive of Climate Change (40%) as well as an allowance of 10% for potential future development on this Phase (Urban Creep).

- FOUL WATER STRATEGY-**
- Foul water disposal should adhere to the following hierarchy:
 1. Public Sewer
 2. Private Treatment Plant
 3. Septic Tank and Drainage Field
 4. Cesspool
 - It is proposed that foul flows generated by Phase 1 of the development will discharge to the existing public foul water sewer located in Sylvan Road, to the east of the site, subject to confirmation of line, level and condition.
 - A S106 application will be required in order to connect to the existing public foul water sewer, subject to approval from Southern Water.
 - A S104 application will need to be submitted to Southern Water should the sewers be offered for adoption.
 - Post development peak foul water flows will amount to 4.44l/s.



-HIGHWAY CATCHMENTS, LOADING AND REFERENCING KEY-

> > >

Surface Water Link

●

Surface Water Node

Proposed Soakaway

Proposed Permeable Paving

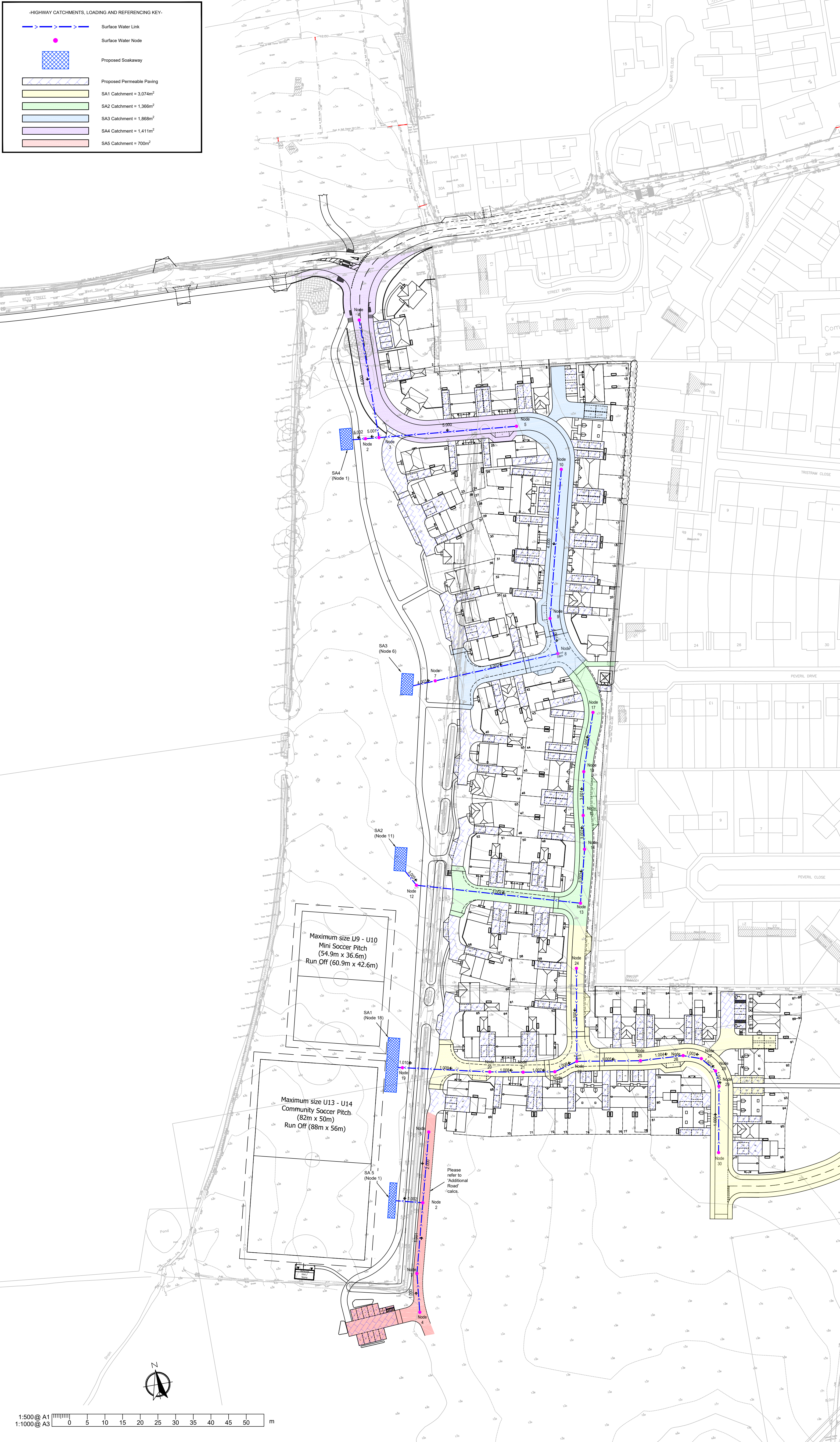
SA1 Catchment = 3,074m²

SA2 Catchment = 1,366m²

SA3 Catchment = 1,868m²

SA4 Catchment = 1,411m²

SA5 Catchment = 700m²



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11. Contractor to confirm all invert levels where connections are proposed prior to commencing any drainage works. Contractor to commence drainage works at the point of discharge.

Rev.	Date	Amendments	Drawn	Appr.
B	08/02/2021	Service margins provided in permeable paving	SPB	MJA
A	29/01/2021	Revised site layout	SPB	MJA
-	23/06/2020	Original Issue	SPB	MJA



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Client
Persimmon Homes

Project
Land at West Sompitng Phase 1

Drawing Title
Surface Water Drainage Catchments, Loading and Referencing

Scale	Drawn By	Checked By	Approved By
1:500	SPB	MJA	MJA
Date	Drawing No.	Rev.	
June 2020	D1358-SK400	B	

PLANNING

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1:500 @ A1
1:1000 @ A3
0 5 10 15 20 25 30 35 40 45 50 m

APPENDICIES

Appendix A Development Proposals

Appendix B Infiltration Testing Results (Resource & Environment Consultants)

EXECUTIVE SUMMARY

Site Address	West Street, Sompting, West Sussex, BN15 0DF
Grid Reference	516679,105450
Site Area	27.25 hectares (ha)
Current Site Use	The site is situated to the north and south of West Street, Sompting and can be split into three areas. These comprised the northern section of ~9.4 ha, which was primarily an equine paddock, a southern of ~17 ha area of open farm land used for grain crops and a second smaller section ~3.5 ha comprising a small paddock area.

Intrusive Ground Investigation

Ground Conditions	Made Ground Made Ground was variable in composition comprising both fine and coarse grained soils. Coarse grained soils typically comprised dark slightly clayey sandy GRAVEL. Sand was coarse grained with gravel comprising angular, fine to coarse flints with occasional brick. Fine grained soils typically comprised dark brown slightly gravelly sandy silty CLAY. Superficial Head Deposits were highly variable in composition and consistency comprising both fine and coarse grained soils. Coarse grained soils typically comprised light brown slightly sandy clayey GRAVEL and soft to firm CLAY / SILT with variable quantities of sand and gravel. Bedrock The Tarrant Chalk member was encountered at depths ranging between 1.70 and 9.00mbgl and was recovered as creamy off white putty chalk due to the percussive nature of the window sampling and cable percussive rigs. Ground Water Groundwater was encountered as seepages in window samples locations between 1.20mbgl and 4.00mbgl although at depths generally greater than 2.20mbgl and was generally found within areas of high sand and gravel content. The cable percussive locations encountered groundwater and gave strikes between 6.5mbgl and 13.5mbgl.
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Geotechnical Considerations

Foundations and Construction Considerations	Based on a typical undrained shear strength of 50kN/m² derived from SPT's and hand shear vanes and a relative density of medium dense in coarse grained soils, allowable bearing capacities for conventional shallow foundations in the range of 100 kN/m² could be achieved limiting total settlement to less than 25mm. Piled foundations formed into the Head Deposits and underlying Chalk could be considered for larger structures. Loads of 180kN could be transferred to depths of 10m on a pile diameter of 300mm. Further detail is presented in Section 5.0.
Sulphate Assessment	Class DS-1, AC-1d

3.0 GROUND AND GROUNDWATER CONDITIONS

3.1 Ground Conditions

3.1.1 Summary of Ground Conditions

The ground investigation generally confirmed the published geology and identifies the strata set out in Table 3.1 below:

Table 3.1 Summary of Strata

Strata	Min Depth to Top of Strata (mbgl)	Max Depth to Top of Strata (mbgl)	Max Thickness (m)
Made Ground	Ground Level	Ground Level	0.70 (CP105)
Head Deposits (Superficial)	0.02 (CP103)	0.70 (CP101)	8.98 (CP101)
Tarrant Chalk Member (Bedrock)	1.70 (WS114)	9.00 (CP101)	>14.60 (CP106 - Base not proven)

3.1.1.1 Made Ground

Made Ground was encountered within all intrusive locations to a maximum proven depth of 0.70 m bgl (CP101). This unit was generally variable in composition comprising both fine and coarse grained soils. Coarse grained soils typically comprised dark slightly clayey sandy GRAVEL. Sand was coarse grained with gravel comprising angular, fine to coarse flints with occasional brick. Fine grained soils typically comprised dark brown slightly gravelly sandy silty CLAY.

3.1.1.2 Drift Deposits

Head Deposits (HD)

The Head Deposits were encountered in all intrusive locations to a maximum depth of 9.00 m bgl (CP101). This stratum was highly variable in composition and consistency comprised both fine and coarse grained soils. Coarse grained soils typically comprised light brown slightly sandy clayey GRAVEL and soft to firm CLAY / SILT with variable quantities of sand and gravel.

3.1.1.3 Bedrock

Tarrant Chalk Member (TC)

The Tarrant Chalk member was encountered at depths ranging between 1.70 and 9.00mbgl and was recovered as creamy off white putty chalk due to the percussive nature of the window sampling and cable percussive sampling method.

3.1.1.4 Obstructions and Ground Stability

Some instability was noted within the exploratory hole locations detailed overleaf:

Table 3.7 PSD Summary

Location	Depth (m)	Granulometric Composition (%)			
		Clay/Silt	Sand	Gravel	Cobbles
BH105	6.00	29	31	40	0
SA1	2.00	58	23	19	0
TP135	2.10	16	7	68	9
WS101	1.30	62	20	18	0
WS108	3.80	24	26	50	0
WS110	4.2	45	26	29	0

3.1.7 Soil Infiltration

Seven soil infiltration tests were undertaken within locations SA1 to SA7 inclusive in order to obtain indicative information on soil infiltration. Results are presented in Table 3.8 below:

Table 3.8 Soil Infiltration Results

Location	Trial Pit Depth (m bgl)	Material	Permeability Rate (m/s)
SA1	2.00	Head Deposits	9.38E-06
SA2	2.00	Head Deposits	5.24E-05
SA3	2.00	Head Deposits	2.36E-05
SA4	2.00	Head Deposits	1.53E-04
SA5	2.00	Head Deposits	7.62E-05
SA6	2.00	Head Deposits	9.87E-06
SA7	2.00	Head Deposits	3.39E-05

The calculated permeability rates indicate relatively good drainage conditions across the site. Given the coarse grained nature of the soils tested, it is considered possible that soakaway drainage could be adopted for the proposed scheme; however the application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365 – *Soakaway Design*.

3.2 Groundwater Conditions

During the original site investigation in February 2014 groundwater seepages were noted within window sample locations WS104, WS105, WS106, WS107, WS108, WS109, WS111, WS113 and WS114 at depths ranging between 1.20mbgl and 4.00mbgl, although at depths generally greater than 2.20mbgl.

The cable percussive locations carried out in May 2014 all encountered groundwater at depths ranging between 6.50 m bgl and 13.50 m bgl. No groundwater was encountered within the trial pits during the work undertaken in May 2014.

Key



Trial Pit Location



Window Sample
Probehole Location



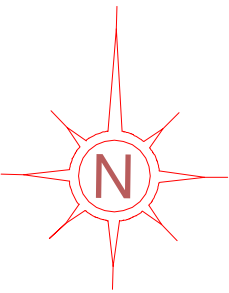
California Bearing
Ratio Test Location



Cable Percussion
Test Location

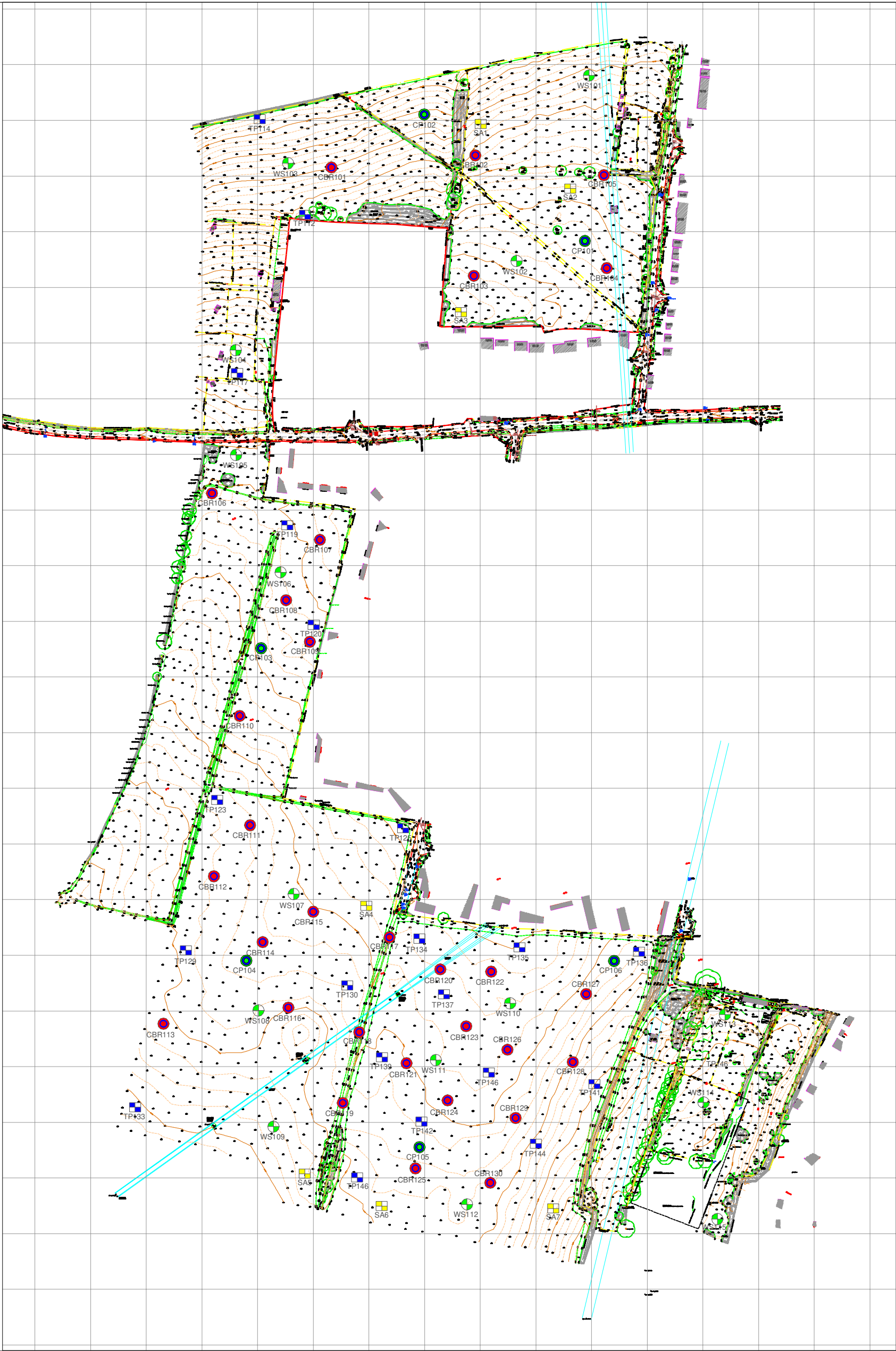


Soakaway Pit Location



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Job Title:	Client:	Job No: 20612	DATE 01-07-14	Drawing Title:
Sompting, West Sussex	PFA Consulting	Drawn by: P.S.Sullivan		Figure 3: Intrusive Works Locations
		Approved by: P.Hird		
		Scale: NTS		

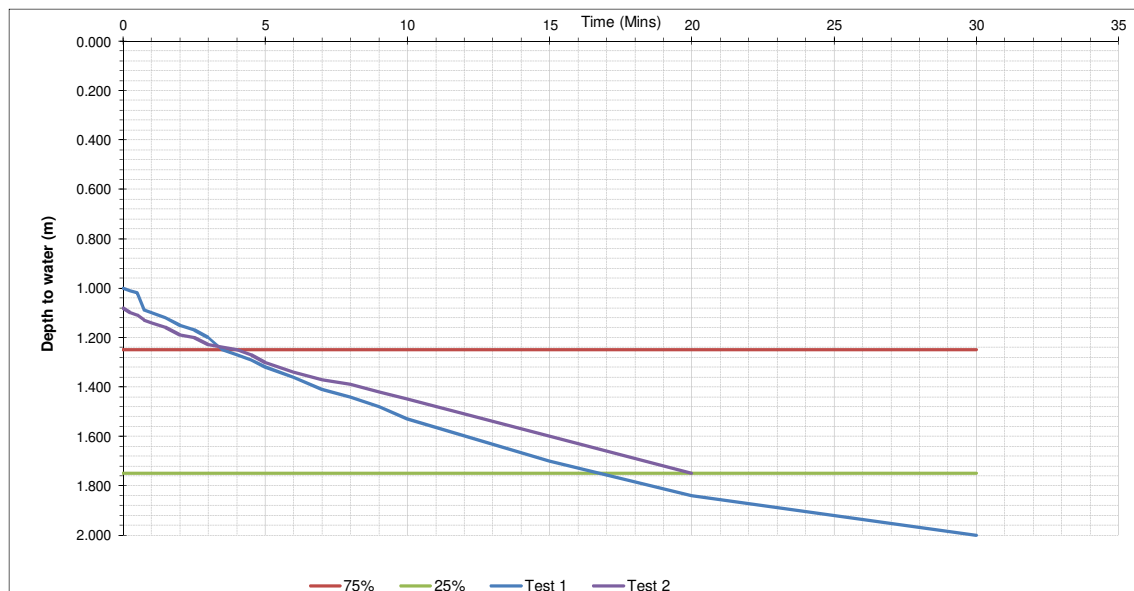
Notes:



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Environmental House,
Segensworth Business Centre,
Fareham, PO15 5RQ
Tel: 0161 868 1300
Fax: 0161 868 1301
E-mail: sales@recltd.co.uk
Website: www.recltd.co.uk

 Resource & Environmental Consultants Ltd		Site Job Number Date of Test		Sompting 20612 28/05/2014		Trial Pit Number Length..... Width..... Depth..... Groundwater Level.....		SA4 1.80 m 0.60 m 2.00 m m	
Remarks		TEST 1		TEST 2		TEST 3			
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)		
		0	1.000	0	1.080				
		0.25	1.010	0.25	1.100				
		0.5	1.020	0.5	1.110				
		0.75	1.090	0.75	1.130				
		1	1.100	1	1.140				
		1.5	1.120	1.5	1.160				
		2	1.150	2	1.190				
		2.5	1.170	2.5	1.200				
		3	1.200	3	1.230				
		3.5	1.250	3.5	1.240				
		4	1.270	4	1.250				
		4.5	1.290	4.5	1.270				
		5	1.320	5	1.300				
		6	1.360	6	1.340				
		7	1.410	7	1.370				
		8	1.440	8	1.390				
		9	1.480	9	1.420				
		10	1.530	10	1.450				
		15	1.700	15	1.600				
		20	1.840	20	1.750				
		30	2.000	30					

DESIGN SOIL INFILTRATION RATE, f	1.53E-04
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			Trial Pit Log			Trialpit No SA4 Sheet 1 of 1		
Project Name: Sompting			Project No. 20612		Co-ords: 516404.09 - 104811.39 Level: 10.35		Date 28/05/2014	
Location: West Sussex					Dimensions (m): 2.00 0.60		Scale 1:20	
Client: Persimmon Homes South Coast					Depth 2.00		Logged PSS	
Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
			0.40	9.95		Brown slightly gravelly SILT. Gravel of subangular to subrounded, fine to medium flint. (MADE GROUND)		
			1.10	9.25		Light brown slightly clayey gravelly SILT. Gravel of angular to subrounded, fine to medium flint. (HEAD DEPOSITS)		
			2.00	8.35		Light brown clayey GRAVEL. Gravel is angular to rounded, fine to coarse flint. (HEAD DEPOSITS)		
						End of pit at 2.00 m		
Remarks: Site cleared with Cable Avoidance Tool and Excavated with a JCB 3CX. No groundwater encountered.								
Stability: Stable								

			Trial Pit Log			Trialpit No TP119 Sheet 1 of 1		
Project Name: Sompting			Project No. 20612		Co-ords: 516312.00 - 105139.82 Level: 11.07		Date 29/05/2014	
Location: West Sussex			Dimensions (m):		1.90 		Scale 1:20	
Client: Persimmon Homes South Coast			Depth 3.50				Logged PSS	
Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
0.40	ES		0.50	10.57		Brown gravelly SILT. Gravel of Angular to subrounded, medium to coarse flint. (MADE GROUND)		
1.20	B					Light brown slightly clayey GRAVEL. Gravel is angular to rounded, fine to coarse flint. (HEAD DEPOSITS)		
1.60			1.60	9.47		Creamy yellow, slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subangular, medium to cobble flint. (HEAD DEPOSITS)		
2.30	B					Pale yellow slightly gravelly SAND. Sand is coarse. Gravel is angular, fine to medium flint. (HEAD DEPOSITS)		
3.00	B		3.50	7.57		End of pit at 3.50 m		
Remarks: Site cleared with Cable Avoidance Tool and Excavated with a JCB 3CX. No groundwater encountered.								
Stability: Stable								

			Trial Pit Log			Trialpit No TP120 Sheet 1 of 1		
Project Name: Sompting			Project No. 20612		Co-ords: 516334.08 - 105058.58 Level: 9.75		Date 29/05/2014	
Location: West Sussex					Dimensions (m): 1.70 		Scale 1:20	
Client: Persimmon Homes South Coast					Depth 3.00		Logged PSS	
Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
0.20	ES		0.30	9.45		Brown gravelly SILT. Gravel of subangular to subrounded, fine to medium flint. (MADE GROUND)		
0.80	B					Light brown slightly clayey sandy GRAVEL. Gravel is angular to rounded, fine to coarse flint. (HEAD DEPOSITS)		
2.90	B		2.90	6.85		Pale creamy yellow slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is angular, medium flint. (HEAD DEPOSITS)		
			3.00	6.75		End of pit at 3.00 m		
Remarks: Site cleared with Cable Avoidance Tool and Excavated with a JCB 3CX. No groundwater encountered.								
Stability: Pit Collapsed to 1.20m								

			Trial Pit Log			Trialpit No TP123 Sheet 1 of 1		
Project Name: Sompting			Project No. 20612		Co-ords: 516253.96 - 104906.49 Level: 3.43		Date 23/05/2014	
Location: West Sussex					Dimensions (m): 3.50 		Scale 1:20	
Client: Persimmon Homes South Coast					Depth 2.60		Logged PSS	
Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
0.70	ES		0.30	3.13		Brown slightly gravelly SILT. Gravel of subangular to subrounded, fine to medium flint. (MADE GROUND)		
			0.90	2.53		Light brown clayey gravelly SILT. Gravel of angular to subrounded fine to coarse flint. (HEAD DEPOSITS)		
			1.60	1.93		Light brown clayey GRAVEL. Gravel is angular to rounded, fine to coarse flint. (HEAD DEPOSITS)		
2.00	B		2.60	0.83		Light brown GRAVEL. Gravel is angular to subrounded, medium to coarse flint. (HEAD DEPOSITS)		
						End of pit at 2.60 m		
Remarks: Site cleared with Cable Avoidance Tool and Excavated with a JCB 3CX. No groundwater encountered.								
Stability: Pit Collapsed to 2.10m								

			Trial Pit Log			Trialpit No TP125 Sheet 1 of 1		
Project Name: Sompting			Project No. 20612		Co-ords: 516429.26 - 104876.70 Level: 6.87		Date 23/05/2014	
Location: West Sussex					Dimensions (m): 3.00 0.60		Scale 1:20	
Client: Persimmon Homes South Coast					Depth 3.50		Logged PSS	
Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
0.40	ES		0.30	6.57		Brown slightly gravelly SILT. Gravel of subangular to subrounded, fine to medium flint. (MADE GROUND)		
						Light brown slightly clayey gravelly SILT. Gravel of angular to subrounded fine to coarse flint. (HEAD DEPOSITS)		
1.00	B		1.40	5.47		Light brown clayey GRAVEL. Gravel is angular to rounded, fine to coarse flint. (HEAD DEPOSITS)		
2.00	B		2.10	4.77		Pale yellow brown sandy GRAVEL. Sand is medium to coarse. Gravel is subangular to rounded fine to coarse flint. (HEAD DEPOSITS)		
3.40	B		2.40	4.47		Pale yellow SAND. Sand is fine to medium. (HEAD DEPOSITS)		
			3.50	3.37		End of pit at 3.50 m		
Remarks: Site cleared with Cable Avoidance Tool and Excavated with a JCB 3CX. No groundwater encountered.								
Stability: Stable								

					Borehole Log			Borehole No. WS107		
Project Name: Sompting					Project No. 20612		Co-ords: 516427.33 - 104755.00		Sheet 1 of 1	
Location: West Sussex					Level: 7.90		Hole Type WS			
Client: Persimmon Homes South Coast					Dates: 10/02/2014 - 10/02/2014		Logged By WS			
Back fill / Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	ES		0.20	7.70		Slight crop cover. Soft dark brown silty CLAY. (MADE GROUND) (MADE GROUND)		
		0.30	ES						Soft brownish orange silty CLAY. Rare gravel of angular, fine to medium flint between 1.0 and 1.2m bgl. (HEAD DEPOSITS) (HEAD DEPOSITS)	
		0.70	ES							
		1.00	S	N=8 (2,2/1,2,2,3)	1.00					1
		1.00	D							
				HVP=60						
				HVP=60						
		1.80	D		2.00					2
		2.00	S	N=7 (4,5/3,2,1,1)	2.00					
										
		2.40	D	HVP=20	2.40	5.50		Firm to stiff dark yellow, slightly silty sandy, gravelly CLAY. Sand is coarse. Gravel of angular, fine to coarse flint, chert and chalk. (HEAD DEPOSITS) (HEAD DEPOSITS)		
		2.60	D							
		3.00	S	N=14 (3,3/4,2,4,4) Water=2.40m	3.00				3	
		3.30	D							
		4.00	S	N=14 (2,2/2,4,4,4)	4.00				4	
		4.30			4.30	3.60		Dark yellow gravelly SAND. Sand is fine to medium. Gravel of angular, fine to coarse flint, chert and chalk. (HEAD DEPOSITS) (HEAD DEPOSITS)		
		4.60	D							
		5.00			5.00	2.90		End of borehole at 5.00 m	5	
Remarks Groundwater strike at 2.40 mbgl. EOH at 4.00 mbgl due to hole collapse .										

Appendix C (Shallow) Infiltration Testing Results (January 2020) and Groundwater Monitoring (December 2019 – March 2020)

Robert Clark
Persimmon Homes Thames Valley
Charles Church House
Knoll Road
Surrey
GU15 3TQ



6th February 2020

Our ref. KT/20/LP002150

Re: LP002150 Infiltration Testing at land west of Loose Lane, Sompting, West Sussex

Dear Robert

1 Introduction

Leap Environmental Ltd (hereafter referred to as **LEAP**) has been appointed by Persimmon Homes Thames Valley to undertake winter groundwater monitoring and shallow infiltration tests in land west of Loose Lane, Sompting, West Sussex, BN15 0DQ (refer to site location plan as Figure 1, Appendix B). This work has been undertaken in accordance with our appointment dated 13th December 2019 as instructed by Robert Clark of Persimmon Homes Thames Valley.

This document presents the results of the infiltration tests only. Groundwater winter monitoring results will be reported separately at the end of March 2020.

The area of investigation covers approximately 5.6Ha and comprises three rectangular agricultural fields. The south eastern field, closest to Loose Lane is used for grazing sheep and the remaining two fields, making up the west and north portions of the site (bisected by a row of trees aligned roughly northeast to southwest), were planted with winter crops. The site is bounded by residential properties along the eastern and northern boundaries and fields to the west and south. We understand that the site will be developed for a residential end-use with associated infrastructure and soft landscaping as per Drawing No. 2017-D1358-SK300 in Appendix B.

The site has been the subject of previous investigations by a third party, Resource and Environmental Consultants (REC) Ltd. The following site investigation report has been supplied by the Client and the reader is referred to this earlier report which should be read in conjunction with this report.

- *'Geo-Environmental Site Investigation Sompting, West Sussex'* by REC Ltd for Persimmon Homes South Coast Issued July 2014 report ref 20612/Report 2.1 Draft.

2 Background Summary

2.1 Geology

The site is entirely underlain by superficial Head deposits over the Tarrant Chalk Member.

2.1.1 Head Deposits

Head deposits accumulated largely by solifluction (the slow downslope movement of soil in response to the seasonal freezing and thawing of ground) and hillwash, mainly under periglacial conditions during the Quaternary glaciations. In general, it occurs beneath concave slopes on the flanks and floors of valleys. It is locally derived and its content reflects the base geology, in this instance it comprises of variable deposits of impure clays, silts and sands, locally gravelly.

2.1.2 Tarrant Chalk Member

Chalk is a very fine-grained white limestone. It consists predominantly of the disaggregated skeletal remains of tiny planktonic algae, composed of almost pure calcium carbonate.

2.2 Hydrogeology

The superficial Head deposits beneath the site are classed as a Secondary Undifferentiated Aquifer and the Tarrant Chalk beneath is a Principal Aquifer.

2.3 Previous Investigation

REC Ltd's intrusive ground investigation was across a wider development area (~28 hectares) and comprised 15 no. windowless sampler boreholes to between 3 and 5 mbgl; 6 No. cable percussion holes to up to 19.5 mbgl; 19 no. trial pits to up to 3.7 mbgl; and 7 No. soakage tests to 2 mbgl.

Within the boundaries of the LEAP investigation area, nine exploratory holes were undertaken by REC Ltd trial, which also included one deep soakaway test (SA4 to 2 mbgl). SA4 was located in the south eastern part of the site, approximately 60m south of LEAP's TP1 position. A plan showing REC's site investigation locations is presented in Appendix B.

REC Ltd logged made ground across the site to a maximum depth of 0.5m. This consisted of varying proportions of clay, silt and flint gravel, except for WS105 which encountered black clayey sandy gravel of fine to coarse asphalt, brick as well as flint. WS105 was the only position where anthropogenic materials were described by REC Ltd. Head deposits were encountered beneath this to a maximum depth of 5m; these varied across the site and comprised both fine and coarse soils. Underlying the Head deposits was the Tarrant Chalk Member. This was encountered only in CP103 within the subject area, from a depth of 2.2mbgl. This was recovered as structureless gravelly clay. CP103 was located approximately 30m east southeast from LEAP's WS3 position, which also encountered chalk (see later section). REC Ltd recorded groundwater strikes between 2.4 to 7.5 m bgl.

Two soakage tests were conducted in SA4 and infiltration rates of 1.92E-04 m/s and 1.53E-04 m/s were recorded.

3 Fieldwork

3.1 Methodology

LEAP have carried out an intrusive investigation, and onsite monitoring at locations specified by the client to fulfil the objectives of this investigation. The intrusive investigations were carried out in two stages: Stage 1 consisted of windowless sampling and installation of six groundwater monitoring wells on the 19th of December 2019; and Stage 2 infiltration testing, which took place on the 30th and 31st of January 2020 and included the following:

- 5 No. 0.64 – 1.05m deep machine excavated trial pits (TP1-TP5); and
- 5 No. BRE365 soakage tests (i.e. 3 No. tests in each pit).

The weather during both visits was predominantly overcast and during the second visit there was occasional drizzle. Rainfall in November was 132% of average, 116% of average in December, and 100% of average in January.

A site plan for the location of each excavation is presented in Figure 2 of Appendix B.

4 Ground Conditions

The logs created for each trial hole are presented in Appendix D. In summary the ground encountered was topsoil or made ground, over gravelly silty clay Head deposits.

Table 1. Summary of the Trial pit logs

Depth from (mbgl)	Depth to (mbgl)	Geology	Description
GL	0.05/0.3	TOPSOIL	Brown slightly silty occasionally sandy clayey TOPSOIL with occasional rootlets. Occasionally gravelly; gravel is rare fine sub-angular flint
GL	0.2	MADE GROUND	Dark brown gravelly clayey MADE GROUND with many rootlets. Gravel is medium to coarse angular flint. Present in TP5 only

Depth from (mbgl)	Depth to (mbgl)	Geology	Description
0.05/0.3	0.64/1.05	Silty/gravelly CLAY	Varying mixtures of clay, silt, and gravel (most often gravelly silty CLAY). Gravel is fine to coarse angular to sub-rounded flint and chalk [HEAD DEPOSITS]

The layering of the ground was generally uniform across the site (topsoil/made ground over Head deposits). Made ground was only encountered in the north west corner of the site, within TP5. Although the soil types present were similar to the rest of the site (i.e. gravelly CLAY), the presence of a black plastic bag at 0.1m and a loose metal bar at 0.15m indicates that this was made ground.

5 BRE365 Soakage Testing

The client specified shallow infiltration tests between 0.50 m to 1.00 m bgl. Three BRE365 soakage tests were conducted in each of the five trial pits. The results are summarised in the table below and full results are provided in Appendix E.

Table 3. Summary of BRE365 soakage tests undertaken by LEAP

Test Locat ion	Base depth (m)	Minimum Recorded Infiltration Rate		Comments
		m/s	L/m ² /min	
TP1	0.64	1.99E-04	11.92	Pit emptied at end of tests 1 and 3 and nearly emptied at end of test 2
TP2	1.05	4.60E-05	2.76	Pit nearly emptied at end of tests 1 and 3 and fell to between 50% and 25% of max water depth in test 2
TP3	0.67	1.15E-04	6.92	By the 2 nd test, pit walls collapsed to 0.6m and by the 3 rd test to 0.52m. Pit emptied at end of each test
TP4	1.03	1.74E-04	10.42	Pit nearly emptied at end of each test
TP5	0.66	5.37E-05	3.22	Pit nearly emptied at end of each test

Please do not hesitate to contact the undersigned if you require any further information.

Yours sincerely,



Kleri Tantele

Enc.

Appendix A - Limitations

Appendix B - Figures

Appendix C – Photos

Appendix D – Trial Hole Logs

Appendix E – Soakage Test Results

This letter report has been prepared by Leap Environmental Ltd on the basis of information received from a variety of sources which Leap Environmental Ltd believes to be accurate. Nevertheless, Leap Environmental Ltd cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

Leap Environmental Ltd has used all reasonable skill, care and diligence in the design and execution of this report, taking into account the manpower and resources devoted to it in agreement with the Client. Although every reasonable effort has been made to obtain all relevant information, all potential contamination, environmental constraints or liabilities associated with the site may not necessarily have been revealed.

This report is generally consistent with the Eurocode requirements for a Ground Investigation Report, noting the limitations on brief to provision of pile design information only. However, the laboratory testing has been carried out on samples which do not comply with the Eurocode classifications as identified in tables 2 and 3 of EN ISO 22475-1. This report should not be deemed as a Geotechnical Design Report, and where any calculations have been made, these are not Eurocode compliant and are for indicative purposes only.

The conclusions reached in this report are necessarily restricted to those which can be determined from the information consulted, and may be subject to amendment in the light of additional information becoming available. These conclusions may not be appropriate for alternative schemes.

This report is confidential to the Client, and Leap Environmental Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Leap Environmental Ltd beforehand. Any such party relies upon the report at their own risk.

APPENDIX A - LIMITATIONS

Limitations
