Southern Water

Stephen
Herrington Consulting
Canterbury Office
Barham Business Park
Elham Valley Road
Canterbury
CT4 6DQ

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: **0330 303 0119**
Email: ***developerservices@southernwater.co.uk***

Our Ref:
SWS-KENT-CC-004377

Date:
05 March 2019

Site: Land adjacent to Capel Street, Capel-le-Ferne, Dover, Kent, South East, CT15 7AH.

Dear Stephen,

Following initial investigations, there is currently adequate capacity in the local sewerage network to accommodate a foul flow for the above development at/downstream of manhole reference TR24399101. Please note that no surface water flows (existing or proposed) can be accommodated within the existing foul sewerage system.

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal S106 connection application is required to be completed and approved by Southern Water Services. Please see the link below:

https://developerservices.southernwater.co.uk/ConnectiontoPublicSewer/ApplicationForm

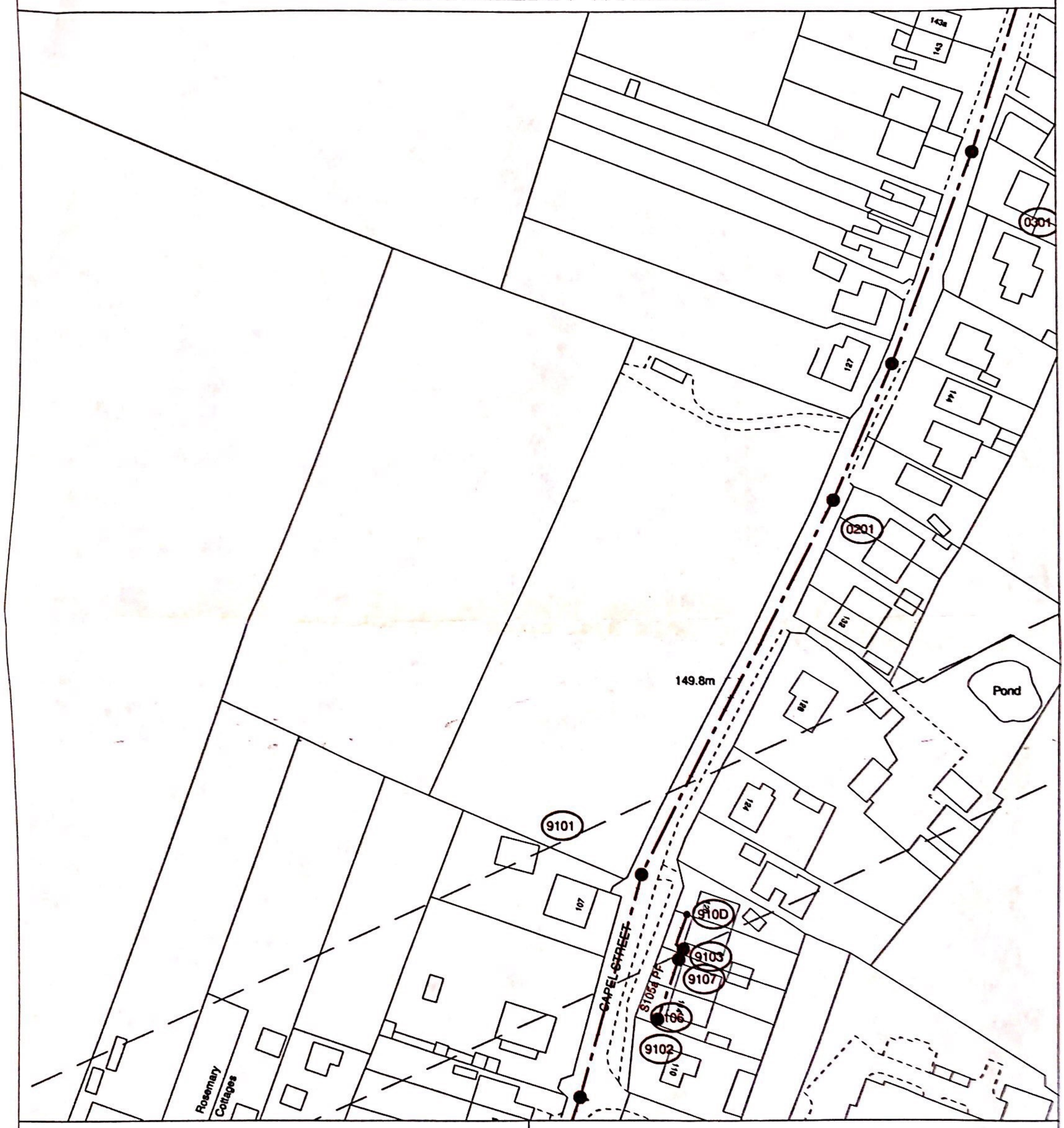
Should you require any further information, please contact us at the above mentioned phone number or address.

Yours sincerely,

Geoff Hall
Developer Services

Please note: -
The information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

SOUTHERN WATER

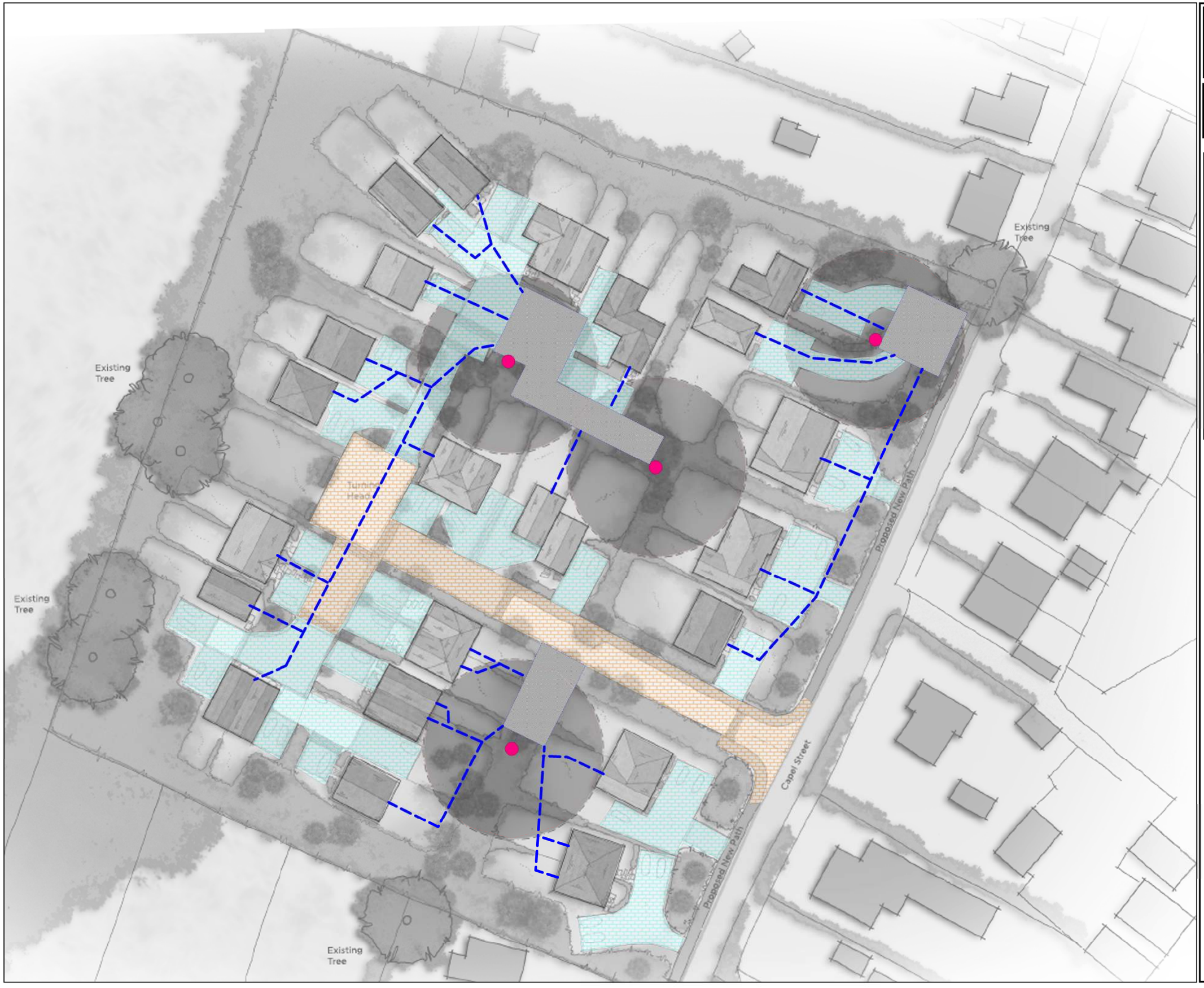


The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

Southern Water

O.S. REF: TR2439SE	Scale: 1:1250	N	Printed By: Roopa — Date: 13-2-2019
Sewer Plot			Sit ePlan
WARNING: BAC pipes are constructed of Bonded Asbestos Cement			Requested By:
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement			

Appendix A.3 – Indicative Drainage Layout Plan



This drawing provides and indicative layout only and does not constitute detailed drainage design. It is recommended that further site investigations are undertaken to confirm the exact layout and dimensions of any existing surface and foul water drainage.

DRAINAGE LAYOUT

Capel Street

Key:

- Storage Tanks
- Borehole Soakaway
- Permeable Surfacing
- Indicative Drainage Connections
- 15m Easement around Borehole Soakaways
- Impermeable Surfacing

N

herrington CONSULTING LIMITED

Unit 6 - Barham Business Park
Elham Valley Road
Barham
Canterbury
Kent
CT4 6DQ

www.herringtonconsulting.co.uk

tel: +44 (0)1227 833855
e-mail: enquiries@herringtonconsulting.co.uk

Drawn: SAH	Date: 24/05/2019	Scale: Not to scale	
Checked:	Date:		
Approved:	Date:	Original @ A3	
Drawing Number: 500/SAH/01	Revision No. 0	Sheet Number: 1 of 1	Status: Final

Appendix A.4 – Surface Water Management Calculations

HR Wallingford
Working with water

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Stephen Hayward
Site name:	Capel Street
Site location:	Capel-Le-Ferne

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site coordinates

Latitude:	51.10827° N
Longitude:	1.21174° E

Reference:	6576686
Date:	2019-05-22T14:49:50

Methodology	FEH Statistical

Site characteristics

Total site area (ha)	1

Methodology

Qmed estimation method	Calculate from BFI and SAAR
BFI and SPR estimation method	Specify BFI manually
HOST class	N/A
BFI / BFIHOST	0.668
Qmed (l/s)	NaN
Qbar / Qmed Conversion Factor	1.14

Hydrological characteristics

	Default	Edited
SAAR (mm)	805	805
Hydrological region	7	7
Growth curve factor: 1 year	0.85	0.85
Growth curve factor: 30 year	2.3	2.3
Growth curve factor: 100 year	3.19	3.19

Notes:

(1) Is Q_{BAR} < 2.0 l/s/ha?

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consents are usually set at 5.0l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set in which case blockage work must be addressed by using appropriate drainage elements

(3) Is SPR/SPRHOST ≤ 0.3?

Greenfield runoff rates

	Default	Edited
Qbar (l/s)	NaN	2.58
1 in 1 year (l/s)	NaN	2.2
1 in 30 years (l/s)	NaN	5.94
1 in 100 years (l/s)	NaN	8.24

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 686 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	8.801	20.301	1.0	30.4	O K
30 min Summer	8.900	20.400	1.0	40.4	O K
60 min Summer	9.000	20.500	1.0	50.3	O K
120 min Summer	9.085	20.585	1.0	58.9	O K
180 min Summer	9.138	20.638	1.0	64.2	O K
240 min Summer	9.176	20.676	1.0	67.9	O K
360 min Summer	9.226	20.726	1.0	73.0	O K
480 min Summer	9.262	20.762	1.0	76.5	O K
600 min Summer	9.284	20.784	1.0	78.7	O K
720 min Summer	9.298	20.798	1.0	80.2	O K
960 min Summer	9.319	20.819	1.0	82.3	O K
1440 min Summer	9.326	20.826	1.0	83.0	O K
2160 min Summer	9.295	20.795	1.0	79.9	O K
2880 min Summer	9.244	20.744	1.0	74.8	O K
4320 min Summer	9.122	20.622	1.0	62.5	O K
5760 min Summer	9.004	20.504	1.0	50.7	O K
7200 min Summer	8.897	20.397	1.0	40.0	O K
8640 min Summer	8.804	20.304	1.0	30.8	O K
10080 min Summer	8.727	20.227	1.0	23.0	O K
15 min Winter	8.801	20.301	1.0	30.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	114.505	0.0	19
30 min Summer	76.933	0.0	33
60 min Summer	49.093	0.0	64
120 min Summer	30.047	0.0	122
180 min Summer	22.706	0.0	182
240 min Summer	18.692	0.0	242
360 min Summer	14.319	0.0	362
480 min Summer	11.953	0.0	480
600 min Summer	10.413	0.0	598
720 min Summer	9.310	0.0	668
960 min Summer	7.787	0.0	792
1440 min Summer	5.962	0.0	1056
2160 min Summer	4.470	0.0	1472
2880 min Summer	3.607	0.0	1876
4320 min Summer	2.630	0.0	2684
5760 min Summer	2.094	0.0	3464
7200 min Summer	1.753	0.0	4248
8640 min Summer	1.517	0.0	4928
10080 min Summer	1.344	0.0	5648
15 min Winter	114.505	0.0	19

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	8.901	20.401	1.0	40.5	O K
60 min Winter	9.001	20.501	1.0	50.4	O K
120 min Winter	9.087	20.587	1.0	59.1	O K
180 min Winter	9.141	20.641	1.0	64.5	O K
240 min Winter	9.180	20.680	1.0	68.3	O K
360 min Winter	9.234	20.734	1.0	73.7	O K
480 min Winter	9.272	20.772	1.0	77.6	O K
600 min Winter	9.298	20.798	1.0	80.2	O K
720 min Winter	9.315	20.815	1.0	81.8	O K
960 min Winter	9.326	20.826	1.0	83.0	O K
1440 min Winter	9.321	20.821	1.0	82.5	O K
2160 min Winter	9.264	20.764	1.0	76.7	O K
2880 min Winter	9.180	20.680	1.0	68.3	O K
4320 min Winter	8.995	20.495	1.0	49.8	O K
5760 min Winter	8.827	20.327	1.0	33.0	O K
7200 min Winter	8.687	20.187	1.0	19.1	O K
8640 min Winter	8.582	20.082	1.0	8.5	O K
10080 min Winter	8.514	20.014	1.0	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	76.933	0.0	33
60 min Winter	49.093	0.0	62
120 min Winter	30.047	0.0	120
180 min Winter	22.706	0.0	178
240 min Winter	18.692	0.0	236
360 min Winter	14.319	0.0	352
480 min Winter	11.953	0.0	464
600 min Winter	10.413	0.0	576
720 min Winter	9.310	0.0	684
960 min Winter	7.787	0.0	878
1440 min Winter	5.962	0.0	1110
2160 min Winter	4.470	0.0	1576
2880 min Winter	3.607	0.0	2016
4320 min Winter	2.630	0.0	2852
5760 min Winter	2.094	0.0	3624
7200 min Winter	1.753	0.0	4320
8640 min Winter	1.517	0.0	4928
10080 min Winter	1.344	0.0	5352

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 624926 139242	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.110

Time (mins) From:	To:	Area (ha)
0	4	0.110

Model Details

Storage is Online Cover Level (m) 10.000

Deep Bore Soakaway Structure

Chamber Invert Level (m)	8.500	Borehole Depth (m)	20.000
Chamber Diameter/Length (m)	10.000	Infiltration Coefficient Base (m/hr)	0.75000
Chamber Width (m)	10.000	Safety Factor	2.0
Borehole Diameter (m)	0.150		

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.75000	11.000	0.75000

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 975 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	8.689	20.389	1.0	39.3	O K
30 min Summer	8.819	20.519	1.0	52.3	O K
60 min Summer	8.952	20.652	1.0	65.5	O K
120 min Summer	9.071	20.771	1.0	77.4	O K
180 min Summer	9.148	20.848	1.0	85.2	O K
240 min Summer	9.206	20.906	1.0	91.0	O K
360 min Summer	9.291	20.991	1.0	99.4	O K
480 min Summer	9.355	21.055	1.0	105.9	O K
600 min Summer	9.402	21.102	1.0	110.6	O K
720 min Summer	9.437	21.137	1.0	114.0	O K
960 min Summer	9.474	21.174	1.0	117.8	O K
1440 min Summer	9.490	21.190	1.0	119.4	O K
2160 min Summer	9.463	21.163	1.0	116.7	O K
2880 min Summer	9.414	21.114	1.0	111.8	O K
4320 min Summer	9.287	20.987	1.0	99.1	O K
5760 min Summer	9.159	20.859	1.0	86.2	O K
7200 min Summer	9.037	20.737	1.0	74.1	O K
8640 min Summer	8.925	20.625	1.0	62.9	O K
10080 min Summer	8.825	20.525	1.0	52.9	O K
15 min Winter	8.690	20.390	1.0	39.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	114.505	0.0	19
30 min Summer	76.933	0.0	34
60 min Summer	49.093	0.0	64
120 min Summer	30.047	0.0	122
180 min Summer	22.706	0.0	182
240 min Summer	18.692	0.0	242
360 min Summer	14.319	0.0	362
480 min Summer	11.953	0.0	482
600 min Summer	10.413	0.0	600
720 min Summer	9.310	0.0	720
960 min Summer	7.787	0.0	916
1440 min Summer	5.962	0.0	1168
2160 min Summer	4.470	0.0	1556
2880 min Summer	3.607	0.0	1964
4320 min Summer	2.630	0.0	2768
5760 min Summer	2.094	0.0	3584
7200 min Summer	1.753	0.0	4392
8640 min Summer	1.517	0.0	5112
10080 min Summer	1.344	0.0	5856
15 min Winter	114.505	0.0	19

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	8.820	20.520	1.0	52.4	O K
60 min Winter	8.952	20.652	1.0	65.6	O K
120 min Winter	9.073	20.773	1.0	77.6	O K
180 min Winter	9.151	20.851	1.0	85.5	O K
240 min Winter	9.210	20.910	1.0	91.4	O K
360 min Winter	9.297	20.997	1.0	100.1	O K
480 min Winter	9.364	21.064	1.0	106.8	O K
600 min Winter	9.415	21.115	1.0	111.8	O K
720 min Winter	9.452	21.152	1.0	115.6	O K
960 min Winter	9.498	21.198	1.0	120.1	O K
1440 min Winter	9.497	21.197	1.0	120.0	O K
2160 min Winter	9.451	21.151	1.0	115.5	O K
2880 min Winter	9.374	21.074	1.0	107.8	O K
4320 min Winter	9.181	20.881	1.0	88.5	O K
5760 min Winter	8.990	20.690	1.0	69.4	O K
7200 min Winter	8.816	20.516	1.0	52.0	O K
8640 min Winter	8.665	20.365	1.0	36.8	O K
10080 min Winter	8.537	20.237	1.0	24.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	76.933	0.0	33
60 min Winter	49.093	0.0	62
120 min Winter	30.047	0.0	120
180 min Winter	22.706	0.0	180
240 min Winter	18.692	0.0	238
360 min Winter	14.319	0.0	354
480 min Winter	11.953	0.0	468
600 min Winter	10.413	0.0	584
720 min Winter	9.310	0.0	694
960 min Winter	7.787	0.0	914
1440 min Winter	5.962	0.0	1210
2160 min Winter	4.470	0.0	1640
2880 min Winter	3.607	0.0	2104
4320 min Winter	2.630	0.0	2984
5760 min Winter	2.094	0.0	3808
7200 min Winter	1.753	0.0	4608
8640 min Winter	1.517	0.0	5280
10080 min Winter	1.344	0.0	5960

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 624926 139242	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.141

Time (mins) From:	To:	Area (ha)
0	4	0.141

Model Details

Storage is Online Cover Level (m) 10.000

Deep Bore Soakaway Structure

Chamber Invert Level (m)	8.300	Borehole Depth (m)	20.000
Chamber Diameter/Length (m)	10.000	Infiltration Coefficient Base (m/hr)	0.75000
Chamber Width (m)	10.000	Safety Factor	2.0
Borehole Diameter (m)	0.150		

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.75000	11.000	0.75000

Summary of Results for 100 year Return Period (+20%)

Half Drain Time : 798 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	8.835	20.335	1.0	33.9	O K
30 min Summer	8.946	20.446	1.0	45.0	O K
60 min Summer	9.058	20.558	1.0	56.2	O K
120 min Summer	9.157	20.657	1.0	66.1	O K
180 min Summer	9.220	20.720	1.0	72.3	O K
240 min Summer	9.265	20.765	1.0	76.8	O K
360 min Summer	9.329	20.829	1.0	83.3	O K
480 min Summer	9.376	20.876	1.0	87.9	O K
600 min Summer	9.408	20.908	1.0	91.1	O K
720 min Summer	9.428	20.928	1.0	93.2	O K
960 min Summer	9.452	20.952	1.0	95.6	O K
1440 min Summer	9.464	20.964	1.0	96.7	O K
2160 min Summer	9.435	20.935	1.0	93.9	O K
2880 min Summer	9.385	20.885	1.0	88.9	O K
4320 min Summer	9.261	20.761	1.0	76.5	O K
5760 min Summer	9.138	20.638	1.0	64.2	O K
7200 min Summer	9.024	20.524	1.0	52.8	O K
8640 min Summer	8.923	20.423	1.0	42.7	O K
10080 min Summer	8.835	20.335	1.0	33.9	O K
15 min Winter	8.835	20.335	1.0	33.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	114.505	0.0	19
30 min Summer	76.933	0.0	34
60 min Summer	49.093	0.0	64
120 min Summer	30.047	0.0	122
180 min Summer	22.706	0.0	182
240 min Summer	18.692	0.0	242
360 min Summer	14.319	0.0	362
480 min Summer	11.953	0.0	480
600 min Summer	10.413	0.0	600
720 min Summer	9.310	0.0	714
960 min Summer	7.787	0.0	834
1440 min Summer	5.962	0.0	1108
2160 min Summer	4.470	0.0	1512
2880 min Summer	3.607	0.0	1928
4320 min Summer	2.630	0.0	2724
5760 min Summer	2.094	0.0	3520
7200 min Summer	1.753	0.0	4320
8640 min Summer	1.517	0.0	5016
10080 min Summer	1.344	0.0	5752
15 min Winter	114.505	0.0	19

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	8.947	20.447	1.0	45.1	O K
60 min Winter	9.059	20.559	1.0	56.3	O K
120 min Winter	9.159	20.659	1.0	66.3	O K
180 min Winter	9.223	20.723	1.0	72.6	O K
240 min Winter	9.269	20.769	1.0	77.3	O K
360 min Winter	9.336	20.836	1.0	83.9	O K
480 min Winter	9.385	20.885	1.0	88.9	O K
600 min Winter	9.421	20.921	1.0	92.4	O K
720 min Winter	9.446	20.946	1.0	94.9	O K
960 min Winter	9.470	20.970	1.0	97.3	O K
1440 min Winter	9.463	20.963	1.0	96.6	O K
2160 min Winter	9.412	20.912	1.0	91.6	O K
2880 min Winter	9.331	20.831	1.0	83.4	O K
4320 min Winter	9.141	20.641	1.0	64.4	O K
5760 min Winter	8.962	20.462	1.0	46.6	O K
7200 min Winter	8.806	20.306	1.0	31.0	O K
8640 min Winter	8.679	20.179	1.0	18.2	O K
10080 min Winter	8.581	20.081	1.0	8.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	76.933	0.0	33
60 min Winter	49.093	0.0	62
120 min Winter	30.047	0.0	120
180 min Winter	22.706	0.0	180
240 min Winter	18.692	0.0	238
360 min Winter	14.319	0.0	352
480 min Winter	11.953	0.0	466
600 min Winter	10.413	0.0	578
720 min Winter	9.310	0.0	688
960 min Winter	7.787	0.0	902
1440 min Winter	5.962	0.0	1128
2160 min Winter	4.470	0.0	1600
2880 min Winter	3.607	0.0	2048
4320 min Winter	2.630	0.0	2900
5760 min Winter	2.094	0.0	3696
7200 min Winter	1.753	0.0	4464
8640 min Winter	1.517	0.0	5104
10080 min Winter	1.344	0.0	5656

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 624926 139242	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 0.122

Time (mins) From:	To:	Area (ha)
0	4	0.122

Model Details

Storage is Online Cover Level (m) 10.000

Deep Bore Soakaway Structure

Chamber Invert Level (m)	8.500	Borehole Depth (m)	20.000
Chamber Diameter/Length (m)	10.000	Infiltration Coefficient Base (m/hr)	0.14000
Chamber Width (m)	10.000	Safety Factor	2.0
Borehole Diameter (m)	0.150		

Depth (m)	Side Infil. Coef. (m/hr)	Depth (m)	Side Infil. Coef. (m/hr)
0.000	0.75000	11.000	0.75000