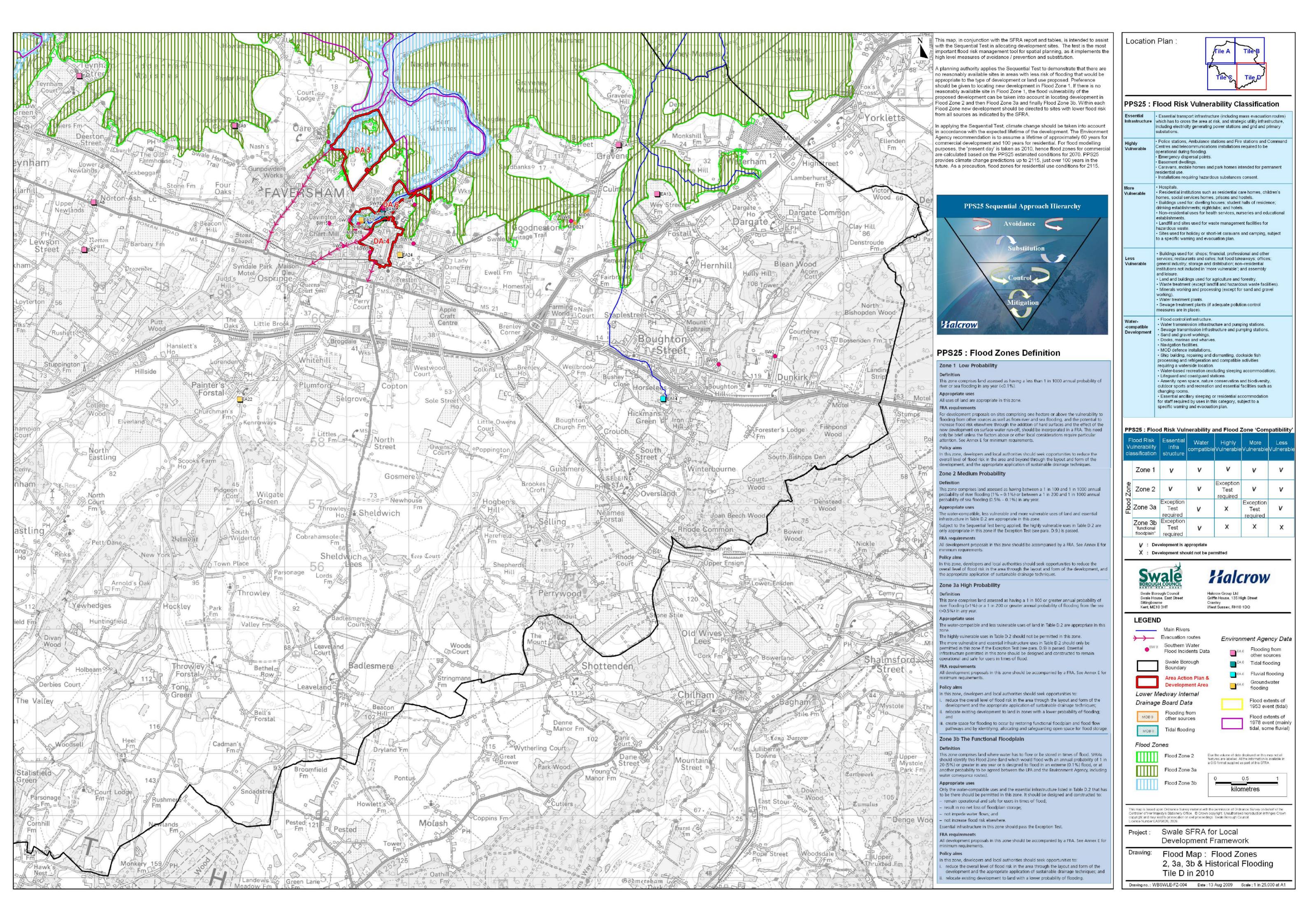
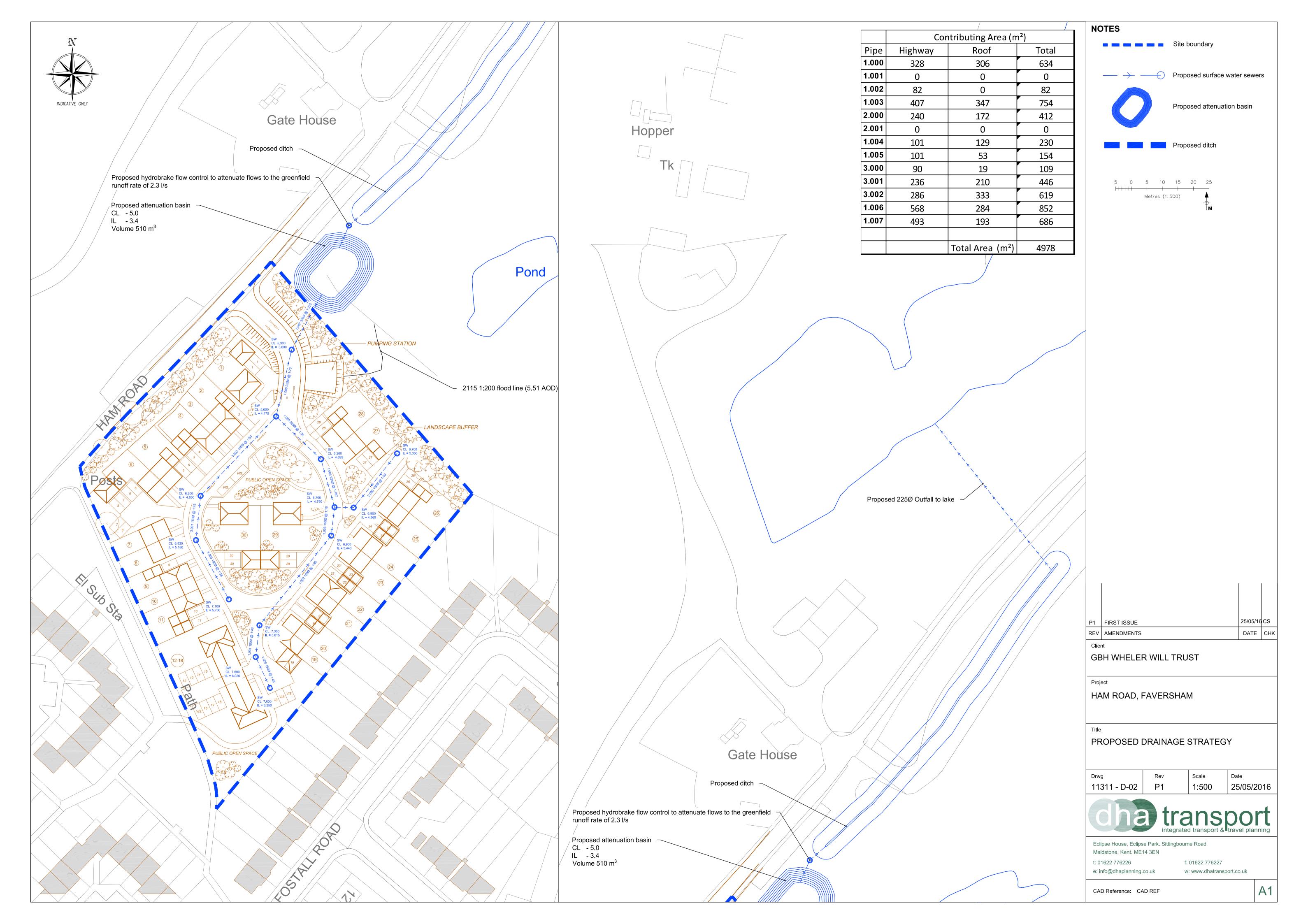
APPENDIX 7.0 – EXTRACTS FROM STRATEGIC FLOOD RISK ASSESSMENT



APPENDIX 8.0 – PROPOSED DRAINAGE STRATEGY AND CALCULATIONS



DHA Transport Ltd	Page 1	
Eclipse House Eclipse Park	Ham Road	
Sittingbourne Road		4
Maidstone ME14 3EN		Micco
Date 28/04/2016 17:01	Designed by chris	Desipago
File SWS 20.04.16.mdx	Checked by	Dialilade
Causeway	Network 2015.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years) 2 Add Flow / Climate Change (%) 0

M5-60 (mm) 20.000 Minimum Backdrop Height (m) 0.000

Ratio R 0.434 Maximum Backdrop Height (m) 0.000

Maximum Rainfall (mm/hr) 50 Min Design Depth for Optimisation (m) 1.200

e of Concentration (mins) 30 Min Vel for Auto Design only (m/s) 1.00

Maximum Time of Concentration (mins) 30 Min Vel for Auto Design only (m/s) 1.00 Foul Sewage (l/s/ha) 0.000 Min Slope for Optimisation (1:X) 500 Volumetric Runoff Coeff. 0.750

Designed with Level Soffits

Time Area Diagram for Storm

Time Area (mins) (ha) (mins) (ha) (ha) 0-4 0.356 4-8 0.142

Total Area Contributing (ha) = 0.498

Total Pipe Volume $(m^3) = 6.802$

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E.	se (1/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1 000	10.900	0 224	48.7	0.064	5.00	0 0	0.600	0	150	ð
	10.300		48.8	0.000	0.00		0.600	0	150	ĕ
1.002	36.900	0.372	99.3	0.008	0.00	0.0	0.600	0	150	ĕ
1.003	9.200	0.578	15.9	0.075	0.00	0.0	0.600	0	150	ē
2.000	22.300	0.381	58.5	0.041	5.00	0.0	0.600	0	150	8
2.001	6.100	0.104	58.7	0.000	0.00	0.0	0.600	0	150	₩

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (1/s)	Foul (1/s)	Add Flow (1/s)	Vel (m/s)	Cap (1/s)	Flow (1/s)
1.000 1.001 1.002 1.003	50.00 50.00 50.00 50.00	5.24 5.85	6.250 6.026 5.815 5.443	0.064 0.064 0.072 0.147	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	1.45 1.44 1.01 2.54	25.6 25.5 17.8 44.8	8.7 8.7 9.7 19.9
2.000	50.00 50.00		5.350 4.969	0.041 0.041	0.0	0.0	0.0	1.32 1.32	23.3 23.3	5.6 5.6

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Eclipse House Eclipse Park	Ham Road	
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File SWS 20.04.16.mdx	Checked by	nialliage
Causeway	Network 2015.1	

Network Design Table for Storm

PN	Length	Fall	Slope	I.Area	T.E.	Ва	se	k	HYD	DIA	Auto
	(m)	(m)	(1:X)	(ha)	(mins)	Flow	(1/s)	(mm)	SECT	(mm)	Design
1.004	16.000	0.095	167.9	0.023	0.00		0.0	0.600	0	225	@
1.005	19.900	0.520	38.3	0.015	0.00		0.0	0.600	0	225	ē
3.000	21.800	0.570	38.2	0.011	5.00		0.0	0.600	0	150	ð
3.001	14.300	0.330	43.3	0.045	0.00		0.0	0.600	0	150	
3.002	32.200	0.600	53.7	0.062	0.00		0.0	0.600	0	150	ē
1.006	22.100	0.300	73.7	0.085	0.00		0.0	0.600	0	225	-0
1.007	22.600	0.100	225.0	0.069	0.00		0.0	0.600	0	300	<u>-</u>

Network Results Table

PN	Rain	T.C.	US/IL	Σ I.Area	Σ Base	Foul	Add Flow	Vel	Cap	Flow
	(mm/hr)	(mins)	(m)	(ha)	Flow (1/s)	(1/s)	(1/s)	(m/s)	(1/s)	(1/s)
1.004	50.00	<i>6</i> 10	4.790	0.211	0.0	0.0	0.0	1.01	40.0	28.6
	30.00	0.10	4.790		0.0	0.0	0.0	1.01	40.0	20.0
1.005	50.00	6.34	4.695	0.226	0.0	0.0	0.0	2.12	84.3	30.6
3.000	50.00	5.22	5.750	0.011	0.0	0.0	0.0	1.63	28.8	1.5
3.001	50.00	5.38	5.180	0.056	0.0	0.0	0.0	1.53	27.1	7.6
3.002	50.00	5.77	4.850	0.118	0.0	0.0	0.0	1.38	24.3	16.0
1.006	50.00	6.58	4.175	0.429	0.0	0.0	0.0	1.53	60.7	58.1
1.007	50.00	6.94	3.800	0.498	0.0	0.0	0.0	1.04	73.8	67.4

DHA Transport Ltd	Page 1	
Eclipse House Eclipse Park	Proposed pond	
Sittingbourne Road		4
Maidstone ME14 3EN		Micco
Date 28/04/2016 17:05	Designed by chris	Desipago
File pond.srcx	Checked by	Dialiards
Causeway	Source Control 2015.1	

Summary of Results for 100 year Return Period (+30%)

	Storm Event		Max Level (m)	Max Depth (m)	Max Control (1/s)	Max Volume (m³)	Status
15	min	Summer	3.965	0.565	1.7	118.7	O K
30	min	Summer	4.100	0.700	1.7	155.1	O K
60	min	Summer	4.225	0.825	1.7	191.9	O K
120	min	Summer	4.337	0.937	1.7	227.3	O K
180	min	Summer	4.393	0.993	1.8	245.8	ОК
240	min	Summer	4.426	1.026	1.8	257.0	ОК
360	min	Summer	4.465	1.065	1.9	270.6	ОК
480	min	Summer	4.486	1.086	1.9	278.1	ОК
600	min	Summer	4.497	1.097	1.9	282.0	O K
720	min	Summer	4.501	1.101	1.9	283.4	ОК
960	min	Summer	4.497	1.097	1.9	281.9	ОК
1440	min	Summer	4.468	1.068	1.9	271.8	O K
2160	min	Summer	4.425	1.025	1.8	256.7	O K
2880	min	Summer	4.385	0.985	1.8	243.1	O K
4320	min	Summer	4.311	0.911	1.7	218.8	ОК
5760	min	Summer	4.241	0.841	1.7	196.9	ОК
7200	min	Summer	4.174	0.774	1.7	176.5	ОК
8640	min	Summer	4.108	0.708	1.7	157.3	ОК
10080	min	Summer	4.040	0.640	1.7	138.6	ОК
15	min	Winter	4.020	0.620	1.7	133.1	ОК
30	min	Winter	4.165	0.765	1.7	173.9	O K

	Stor: Even		Rain (mm/hr)		Discharge Volume (m³)	Time-Peak (mins)
15	min	Summer	128.285	0.0	117.0	19
30	min	Summer	84.226	0.0	136.7	34
60	min	Summer	52.662	0.0	196.0	64
120	min	Summer	31.800	0.0	236.1	124
180	min	Summer	23.353	0.0	258.8	184
240	min	Summer	18.644	0.0	272.8	242
360	min	Summer	13.543	0.0	281.2	362
480	min	Summer	10.792	0.0	281.6	482
600	min	Summer	9.043	0.0	281.0	602
720	min	Summer	7.823	0.0	280.3	722
960	min	Summer	6.219	0.0	278.7	960
1440	min	Summer	4.493	0.0	276.7	1240
2160	min	Summer	3.241	0.0	435.8	1604
2880	min	Summer	2.568	0.0	460.0	2016
4320	min	Summer	1.847	0.0	481.8	2852
5760	min	Summer	1.461	0.0	524.7	3680
7200	min	Summer	1.217	0.0	546.3	4472
8640	min	Summer	1.048	0.0	564.4	5280
10080	min	Summer	0.923	0.0	579.8	6056
15	min	Winter	128.285	0.0	129.1	19
30	min	Winter	84.226	0.0	135.8	34

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DHA Transport Ltd	Page 2	
Eclipse House Eclipse Park	Proposed pond	
Sittingbourne Road		4
Maidstone ME14 3EN		Micro
Date 28/04/2016 17:05	Designed by chris	Designado
File pond.srcx	Checked by	namaye
Causeway	Source Control 2015.1	

Summary of Results for 100 year Return Period (+30%)

	Storm Event		Max Level (m)	Max Depth (m)	Max Control (1/s)	Max Volume (m³)	Status
60	min	Winter	4.300	0.900	1.7	215.4	ОК
120	min	Winter	4.422	1.022	1.8	255.8	ОК
180	min	Winter	4.483	1.083	1.9	277.2	ОК
240	min	Winter	4.520	1.120	1.9	290.4	ОК
360	min	Winter	4.565	1.165	1.9	307.0	ОК
480	min	Winter	4.591	1.191	2.0	316.8	ОК
600	min	Winter	4.606	1.206	2.0	322.5	ОК
720	min	Winter	4.614	1.214	2.0	325.5	O K
960	min	Winter	4.617	1.217	2.0	326.6	O K
1440	min	Winter	4.595	1.195	2.0	318.1	ОК
2160	min	Winter	4.543	1.143	1.9	298.9	ОК
2880	min	Winter	4.494	1.094	1.9	281.1	O K
4320	min	Winter	4.395	0.995	1.8	246.5	O K
5760	min	Winter	4.296	0.896	1.7	214.1	O K
7200	min	Winter	4.198	0.798	1.7	183.8	O K
8640	min	Winter	4.099	0.699	1.7	154.8	O K
10080	min	Winter	3.985	0.585	1.7	123.9	ОК

	Storm		Rain	${\tt Flooded}$	Discharge	Time-Peak
	Even	t	(mm/hr)	Volume	Volume	(mins)
				(m³)	(m³)	
		Winter		0.0	219.3	64
120	min	Winter	31.800	0.0	262.8	122
180	min	Winter	23.353	0.0	281.3	180
240	min	Winter	18.644	0.0	284.5	240
360	min	Winter	13.543	0.0	285.7	356
480	min	Winter	10.792	0.0	286.2	474
600	min	Winter	9.043	0.0	286.8	590
720	min	Winter	7.823	0.0	287.6	702
960	min	Winter	6.219	0.0	290.0	926
1440	min	Winter	4.493	0.0	290.0	1356
2160	min	Winter	3.241	0.0	487.8	1704
2880	min	Winter	2.568	0.0	514.2	2160
4320	min	Winter	1.847	0.0	504.2	3072
5760	min	Winter	1.461	0.0	587.6	3976
7200	min	Winter	1.217	0.0	611.9	4832
8640	min	Winter	1.048	0.0	632.2	5704
10080	min	Winter	0.923	0.0	649.5	6560

DHA Transport Ltd		
Eclipse House Eclipse Park	Proposed pond	
Sittingbourne Road		4
Maidstone ME14 3EN		Micco
Date 28/04/2016 17:05	Designed by chris	Desipage
File pond.srcx	Checked by	Dialilade
Causeway	Source Control 2015.1	•

Rainfall Details

Return Period (years) 100 Cv (Summer) 0.750
Region England and Wales Cv (Winter) 0.840
M5-60 (mm) 20.000 Shortest Storm (mins) 15
Ratio R 0.400 Longest Storm (mins) 10080
Summer Storms Yes Climate Change % +30

Time Area Diagram

Total Area (ha) 0.499

Time (mins) Area From: To: (ha)

DHA Transport Ltd	Page 4	
Eclipse House Eclipse Park	Proposed pond	
Sittingbourne Road		4
Maidstone ME14 3EN		Micco
Date 28/04/2016 17:05	Designed by chris	Designation
File pond.srcx	Checked by	Dialilads
Causeway	Source Control 2015.1	

Model Details

Storage is Online Cover Level (m) 5.000

Tank or Pond Structure

Invert Level (m) 3.400

Depth (m)	Area (m²)						
0.000	166.0	0.700	283.0	1.400	425.0	2.100	471.0
0.100	181.0	0.800	300.0	1.500	448.0	2.200	471.0
0.200	196.0	0.900	320.0	1.600	471.0	2.300	471.0
0.300	212.0	1.000	339.0	1.700	471.0	2.400	471.0
0.400	229.0	1.100	360.0	1.800	471.0	2.500	471.0
0.500	246.0	1.200	381.0	1.900	471.0		
0.600	263.0	1.300	403.0	2.000	471.0		

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0064-2300-1700-2300
Design Head (m) 1.700
Design Flow (1/s) 2.3
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 64
Invert Level (m) 3.400
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (1/s)
Design Point (Calculated)	1.700	2.3
Flush-Flo™	0.279	1.7
Kick-Flo®	0.569	1.4
Mean Flow over Head Range		1.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (1/s)	Depth (m) Flo	ow (1/s)	Depth (m) Flo	w (1/s)	Depth (m)	Flow (1/s)
0 100		1 000	0 0	2 222	2 0		
0.100	1.5	1.200	2.0	3.000	3.0	7.000	4.4
0.200	1.7	1.400	2.1	3.500	3.2	7.500	4.6
0.300	1.7	1.600	2.2	4.000	3.4	8.000	4.7
0.400	1.7	1.800	2.4	4.500	3.6	8.500	4.8
0.500	1.6	2.000	2.5	5.000	3.8	9.000	5.0
0.600	1.4	2.200	2.6	5.500	4.0	9.500	5.1
0.800	1.6	2.400	2.7	6.000	4.1		
1.000	1.8	2.600	2.8	6.500	4.3		

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APPENDIX 9.0 – FOUL WATER CAPACITY CHECK



DHA Transport Eclipse House Eclipse Park Maidstone Kent **ME14 3EN**



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

Tel: 0330 303 0119

Email: developerservices@southernwater.co.uk

Your Ref: SS/11311

Our Ref: CC-KENT-00301

22nd March 2016

F.A.O: Mr. S. Smith.

Site: Land East of Ham Road, Oare, Faversham, Kent, ME13 7ER.

Dear Sirs.

Please find enclosed the capacity assessment recently undertaken for your proposed development site. As you are aware the owner or occupier of the premises or private sewer or drain must give the sewerage undertaker notice of the proposed works. Upon receipt of the notice the undertaker may, within 21 days, refuse to allow him to make the connection if it considers that the mode of construction or the condition of the connecting sewer or drain either does not satisfy the standards reasonably required by the undertaker, or is such that the making of the communication would be prejudicial to its sewerage system.

The right of refusal is limited to these criteria alone and the undertaker cannot refuse to allow the connection on the grounds that the sewerage system is inadequate to take the extra liquid that the connection will discharge into it. This is a matter that should be dealt with at the planning stage.

Yours, faithfully

Developer Services

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.



INFRASTRUCTURE ASSESSMENT FOR FOUL DRAINAGE AT

LAND EAST OF HAM ROAD
OARE

FAVERSHAM

KENT

ME13 7ER

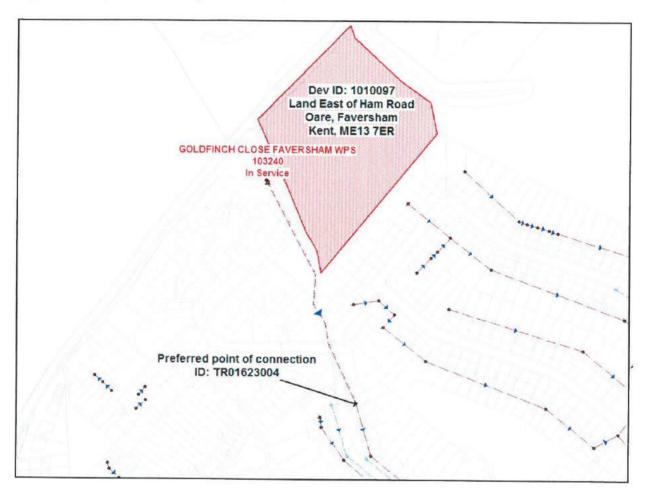
22ND MARCH 2016

REQUESTED: DHA TRANSPORT

I. Development Details:

The proposal is to discharge foul flow from the proposed development to the local foul sewerage systems at manhole reference TR01623004 which is located 97m south from the proposed development.

Figure 1 - Proposed Development



II. Results and Conclusions:

Foul Water:

There is currently adequate capacity within the existing foul sewerage network to accommodate the additional foul flow from the proposed development site. The proposed development does not increase local flow to the proposed connection manhole TR01623004, thus additional surcharge or flooding to the existing system is not predicted to occur. Therefore no remedial work is required to accommodate the proposed development.

Surface Water:

As a surface water capacity check has not been requested it is assumed that Surface Water will be disposed of by alternative means i.e. soakaways or any local drainage watercourses, subject to all interested parties approval.

Before any connections are made, an application form needs to be completed and approved by Southern Water Services.

Infrastructure Assessment for Foul Water Drainage Provision at Ham Road, Oare

Please note: - The information provided above does not grant approval for any designs /drawings submitted for the capacity analysis. The results are an indicative hydraulic assessment and should <u>not</u> be used as a basis for design. The results quoted above are only valid for 12 months from the date of issue of this letter.

PUBLIC SEWER RECORD

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.

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Sewer Plot

O.S. REF: TR0162SW

00D

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

Scale: 1:1250

Printed By: sierrob

Southern Water MapGuide Browser

Requested By: Sewer Record Extract



Date: 21-3-2016