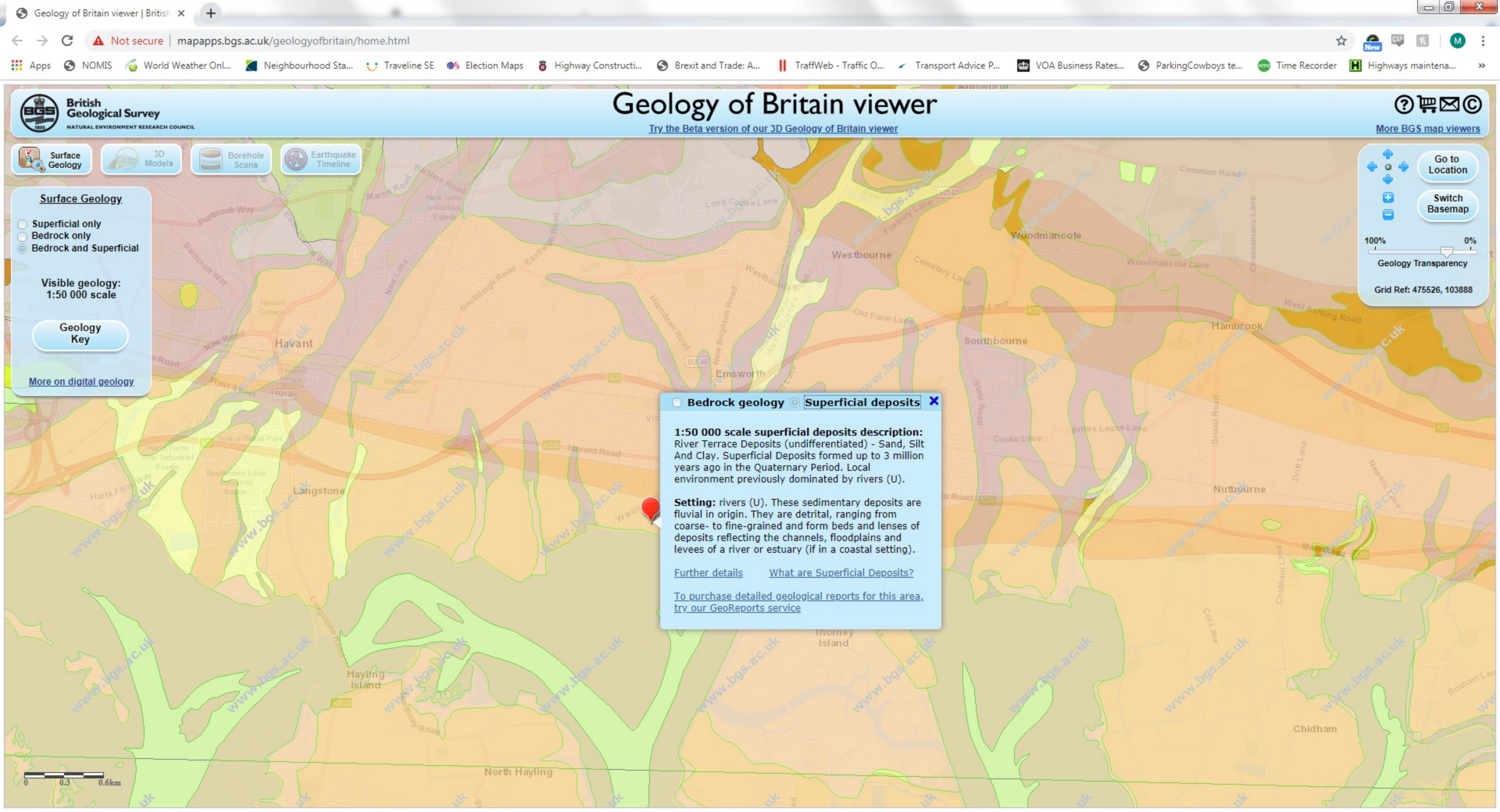


APPENDIX 4



Geology of Britain viewer

[Try the Beta version of our 3D Geology of Britain viewer](#)

[More BGS map viewers](#)

-  Surface Geology
-  3D Models
-  Borehole Scans
-  Earthquake Timeline

Surface Geology

- ☐ Superficial only
- ☐ Bedrock only
- ☒ Bedrock and Superficial

Visible geology:
1:50 000 scale

Geology
Key

[More on digital geology](#)



[Go to Location](#)

[Switch Basemap](#)

100%

0%

Geology Transparency

Grid Ref: 475526, 103888

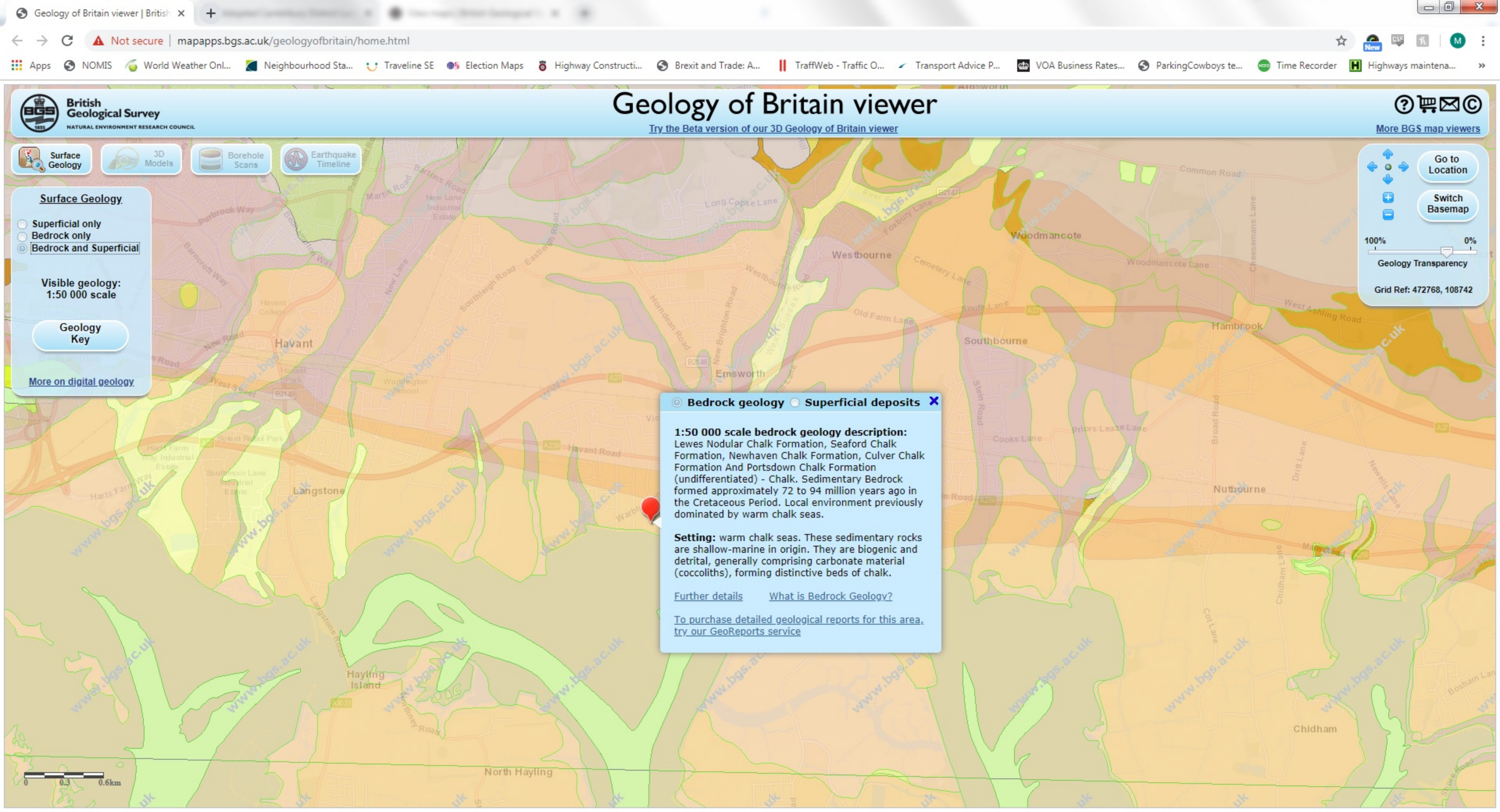
Bedrock geology ☒ Superficial deposits

1:50 000 scale superficial deposits description:
River Terrace Deposits (undifferentiated) - Sand, Silt And Clay. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U).

Setting: rivers (U). These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

[Further details](#) [What are Superficial Deposits?](#)

[To purchase detailed geological reports for this area, try our GeoReports service](#)



APPENDIX 5

Bellamy Roberts		Page 1
Clover House Western Lane Odiham Hants RG29 1TU		
Date 14/01/2020 12:33 File	Designed by jasonbrown Checked by	
XP Solutions Source Control 2015.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	1.000	Urban	0.000
SAAR (mm)	700	Region Number	Region 7

Results l/s

QBAR Rural	3.4
QBAR Urban	3.4
Q100 years	10.9
Q1 year	2.9
Q30 years	7.7
Q100 years	10.9

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APPENDIX 6



Atkins Global
The Hub, 500
Park Avenue
Bristol
BS32 4RZ

Your ref 54886
Our ref 245484
Date 22 May 2017
Contact searches@southernwater.co.uk
Tel 0845 272 0845
0330 303 0276
Fax 01634 844514

Attention: Andrew Aitken

Dear Customer

Re: Provision of public sewer record extract

Location: Site surrounding Warblington Road, Emsworth, PO10 7HD

Thank you for your order regarding the provision of extracts of our sewer and/or water main records. Please find enclosed the extracts from Southern Water's records for the above location.

We confirm payment of your fee in the sum of £49.92 and enclose a VAT receipt for your records.

Customers should be aware that there are areas within our region in which there are neither sewers nor water mains. Similarly, whilst the enclosed extract may indicate the approximate location of our apparatus in the area of interest, it should not be relied upon as showing that further infrastructure does not exist and may subsequently be found following site investigation. Actual positions of the disclosed (and any undisclosed) infrastructure should therefore be determined on site, because Southern Water does not accept any responsibility for inaccuracy or omission regarding the enclosed plan. Accordingly it should not be considered to be a definitive document.

Should you require any further assistance regarding this matter, please contact the LandSearch team.

Yours faithfully

LandSearch

105739



SU7405SW

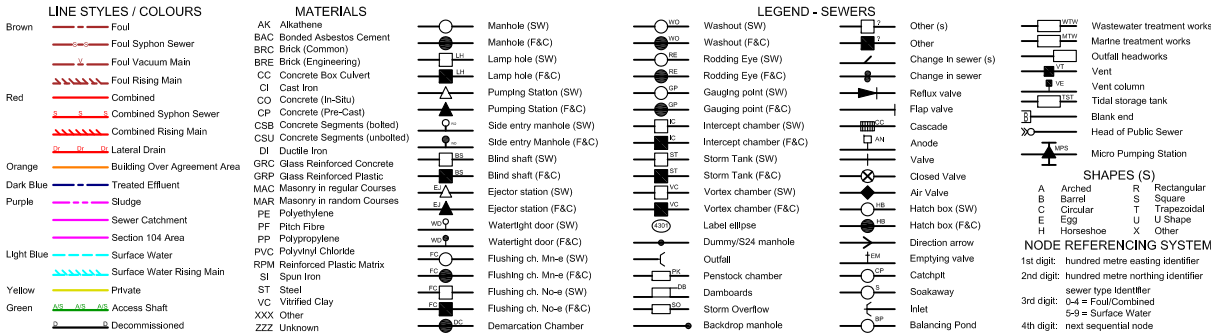


Southern
Water

474074

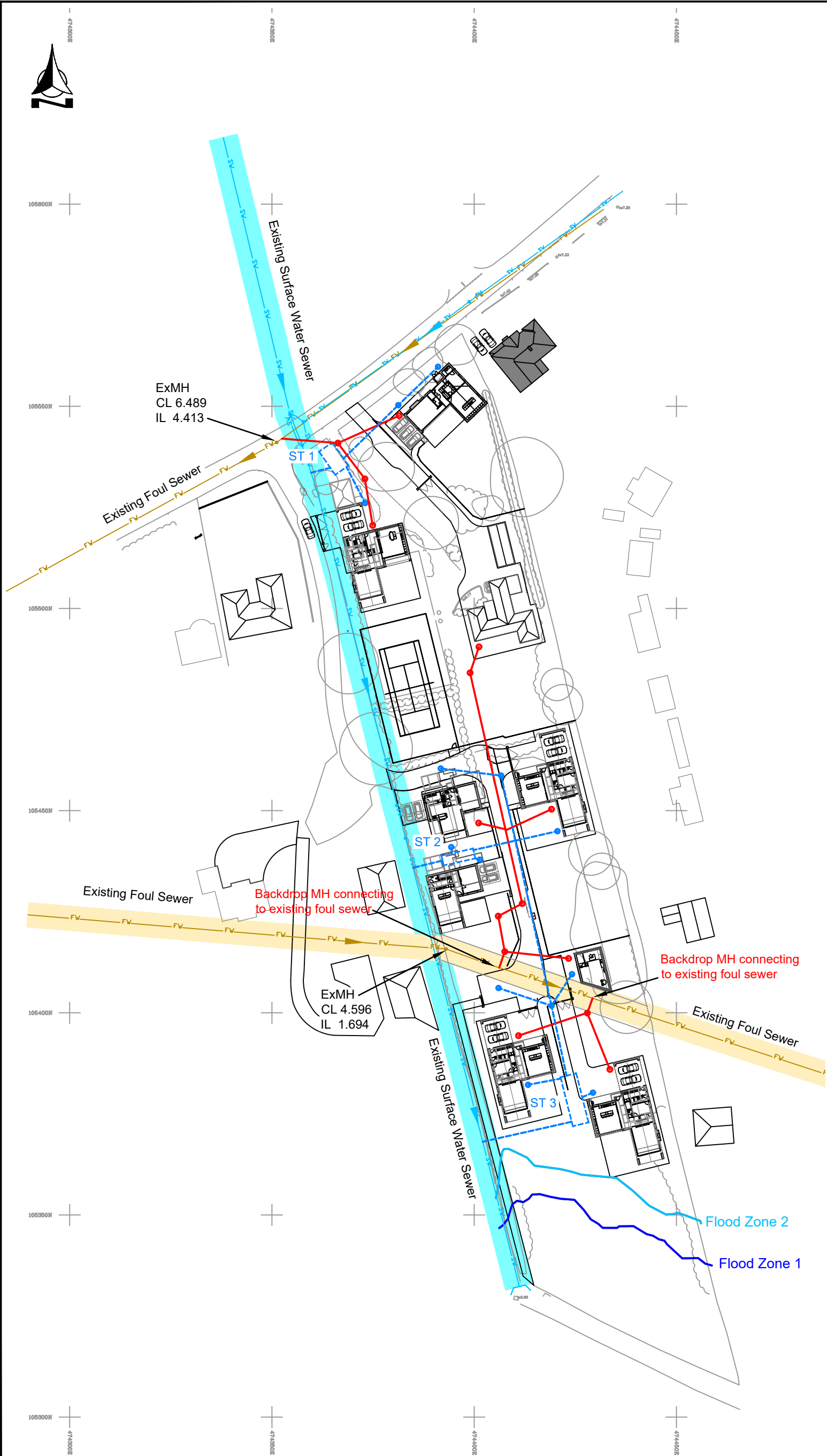
SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
0301X	3.761	2.554	300	UNK	CIRC	2350X	3.269	1.749	UNK	UNK	CIRC	4652X	6.132	5.232	150	UNK	CIRC	8707Y			UNK	UNK	UNK
0302X			UNK	UNK	CIRC	2401X	5.779	2.487	500	PP	CIRC	4751X	6.436		300	UNK	CIRC	870DX			150	UNK	CIRC
0303X	4.279		225	UNK	CIRC	2402X	6.144		500	PP	CIRC	4752X	6.61		225	UNK	CIRC	871DY			150	UNK	CIRC
0304X	3.429	2.478	300	UNK	CIRC	2406Y	4.75		300	UNK	CIRC	* 5301X	3.761		300	UNK	CIRC	8750X	3.035		450	UNK	RECT
0350X	4.382	3.312	225	UNK	CIRC	2406X	4.75	2.065	500	PP	CIRC	* 5350X	3.558	2.478	225	UNK	CIRC	9401X			UNK	UNK	CIRC
0351X	4.281		300	UNK	CIRC	2408X	4.61	2.628	500	PP	CIRC	5401X	5.069	3.094	225	UNK	CIRC	9404X			UNK	UNK	CIRC
0352X	3.562	2.652	300	UNK	CIRC	2450X			UNK	UNK	CIRC	5402X	4.721		UNK	UNK	CIRC	9405X			UNK	UNK	CIRC
0354X	2.62	2.17	UNK	UNK	CIRC	2451X	4.8	3.277	500	PP	CIRC	* 5450X	4.82	3.43	225	UNK	CIRC	9450X			225	UNK	CIRC
0401X	5.599	4.229	UNK	UNK	CIRC	2451Y	4.8	3.254	300	UNK	CIRC	* 5451X	4.536		225	UNK	CIRC	9550X	4.952	3.512	225	UNK	CIRC
0402X	5.583	4.033	UNK	UNK	CIRC	2452X	4.61	2.796	500	PP	CIRC	5501X	5.974	4.325	150	UNK	CIRC	9551X	4.471	3.701	225	UNK	CIRC
0403X	5.363	3.933	UNK	UNK	CIRC	2501X	6.334		200	UNK	CIRC	5502X	5.63	3.572	225	UNK	CIRC	9552X	4.469	3.619	225	UNK	CIRC
0404X	5.397	3.907	150	UNK	CIRC	2502X			100	VC	CIRC	552DX			150	UNK	CIRC	9554X	4.054	3.478	225	UNK	CIRC
0405X	4.398	3.258	150	UNK	CIRC	250DX			200	UNK	CIRC	5550X	6.155	5.055	150	UNK	CIRC	9555X	4.368		225	UNK	CIRC
0406X			UNK	UNK	CIRC	2550X	6.489	4.519	225	UNK	CIRC	5551X	5.922	4.792	150	UNK	CIRC	9601X			UNK	UNK	CIRC
0407X			UNK	UNK	CIRC	2551X	6.244		300	UNK	CIRC	5552X	5.777	4.387	150	UNK	CIRC	9602X			UNK	UNK	CIRC
040DX			UNK	UNK	CIRC	2601X	6.507	5.09	200	UNK	CIRC	* 5553X	5.624		225	UNK	CIRC	9603X			UNK	UNK	CIRC
0450X	4.919	3.109	150	UNK	CIRC	2601Y	6.507		200	UNK	CIRC	* 5552X			225	UNK	CIRC	9604Y			UNK	UNK	CIRC
0451X	5.558	4.518	225	UNK	CIRC	2602X			150	VC	CIRC	5601X	5.352	4.59	150	UNK	CIRC	9605X			150	UNK	CIRC
0452X	5.642	4.362	225	UNK	CIRC	2603X			150	VC	CIRC	5650X	5.568		450	UNK	CIRC	9606X			150	UNK	CIRC
0453X	5.758		225	UNK	CIRC	263DX			150	VC	CIRC	5651X	4.815	3.935	450	UNK	CIRC	9650X			225	UNK	CIRC
0454X	5.33	4.18	UNK	UNK	CIRC	264DX			150	VC	CIRC	5652X	5.352	4.812	150	UNK	CIRC	9651X	5.669	4.109	225	UNK	CIRC
0455X	4.635	3.835	225	UNK	CIRC	2650X	6.516	4.916	UNK	UNK	CIRC	5653X	5.902	4.602	150	UNK	CIRC	9652X			225	UNK	CIRC
0456X	4.379	3.409	225	UNK	CIRC	2701Y	6.571	4.596	225	UNK	CIRC	565ZX			450	UNK	CIRC	9703X			150	UNK	CIRC
0501X	5.7	4.15	150	UNK	CIRC	2702X	6.958		225	UNK	CIRC	5702X			150	PF	CIRC	9704X			150	UNK	CIRC
0502X	5.61	3.99	150	UNK	CIRC	270DX			225	UNK	CIRC	5703X			150	PF	CIRC						
0503X	5.69	3.84	150	UNK	CIRC	271DX			225	UNK	CIRC	5750X	5.196	4.536	225	UNK	CIRC						
0504X	5.55	3.77	150	UNK	CIRC	2751X	6.938	6.288	225	UNK	CIRC	5751X	5.608	4.308	375	UNK	CIRC						
0505X	5.865	4.565	UNK	UNK	CIRC	2752X	7.156	5.876	150	UNK	CIRC	5752X	5.231		225	UNK	CIRC	*					
0506X	5.785	4.335	UNK	UNK	CIRC	2753X	6.541	5.301	225	UNK	CIRC	5752Y	5.231		150	UNK	CIRC	*					
0507X	5.525	4.205	150	UNK	CIRC	3401X	4.596	1.694	300	UNK	CIRC	575ZX			375	UNK	CIRC						
0508X			UNK	UNK	CIRC	3450X			450	UNK	CIRC	6301X	3.529	0.884	300	UNK	CIRC						
0509X			UNK	UNK	CIRC	3451X			450	UNK	CIRC	6401X			UNK	UNK	CIRC						
0550X	5.994		225	UNK	CIRC	3501X	6.489	4.413	225	UNK	CIRC	6402X			UNK	UNK	CIRC						
0551X	5.826	4.816	225	UNK	CIRC	3502X			UNK	VC	CIRC	6403X			UNK	UNK	CIRC						
0552X			150	UNK	CIRC	3503X			225	UNK	CIRC	640DX			UNK	UNK	CIRC						
0601X			UNK	UNK	CIRC	3550X	6.478	4.998	225	UNK	CIRC	6601X			UNK	UNK	CIRC						
0602X			100	VC	CIRC	3551Z	6.56	5.36	225	CO	CIRC	* 6603X			UNK	PF	CIRC						
060DX			100	VC	CIRC	3551Y	6.56	5.36	225	CO	CIRC	* 6604X			UNK	PF	CIRC						
061DX			100	VC	CIRC	3551X	6.56	5.36	300	CO	CIRC	* 6650X	3.474	2.604	225	UNK	CIRC						
063DX			UNK	UNK	CIRC	3552Y	6.564		450	UNK	CIRC	6651X	3.287	2.291	225	UNK	CIRC						
0650X	6.35	5.52	150	UNK	CIRC	3553Y	6.477		225	UNK	CIRC	665ZX			375	UNK	CIRC						
0651X	5.81	5.2	150	UNK	CIRC	3554X	6.693		150	UNK	CIRC	7201X	3.017	1.493	UNK	UNK	CIRC						
0752X	7.642	6.382	225	UNK	CIRC	3555X			375	CO	CIRC	7301X	2.975	0.637	300	UNK	CIRC						
1301X	4.514	2.39	300	UNK	CIRC	3601X	6.431	5.294	150	UNK	CIRC	730LX			150	UNK	CIRC						
1302X	4.803	3.514	225	UNK	CIRC	3650Y	6.546		300	CO	CIRC	7401X	2.929	0.515	300	UNK	CIRC						
1401Y	5.443	2.649	300	PVC	CIRC	3650X	6.546	6.046	300	CO	CIRC	* 7501X	3.011		375	CI	CIRC						
1401Y	5.443		300	UNK	CIRC	3651X	6.364	5.544	225	UNK	CIRC	* 7502X	3.006	0.283	300	UNK	CIRC						
1401X	5.443	3.58	300	PVC	CIRC	3652X			375	CO	CIRC	7503X			UNK	UNK	CIRC						
1450X	5.445	4.195	UNK	UNK	CIRC	3653X	6.529		375	CO	CIRC	7504X			100	VC	CIRC						
1451X	5.095	3.875	225	UNK	CIRC	3654X			375	CO	CIRC	750DX			300	UNK	CIRC						
1501X	6.431	3.222	225	UNK	CIRC	3701X	6.495		225	UNK	CIRC	7601X			UNK	UNK	CIRC						
1502X	6.15		225	UNK	CIRC	3751X	6.517	5.867	150	UNK	CIRC	7602X			UNK	UNK	CIRC						
1503X	6.343	5.083	150	UNK	CIRC	3753X			300	CO	CIRC	7603X			UNK	UNK	CIRC						
1504X	6.047	2.972	300	UNK	CIRC	4301X			UNK	UNK	CIRC	7604X			UNK	UNK	CIRC						
1550X	6.391	5.741	225	UNK	CIRC	430DX			300	UNK	CIRC	7605X			UNK	UNK	CIRC						
1551X	5.993	4.683	225	UNK	CIRC	4401X	4.88	3.612	225	UNK	CIRC	7650X	3.005	2.245	225	UNK	CIRC						
1552X	6.366	5.156	225	UNK	CIRC	4402X			UNK	UNK	CIRC	7651X	3.082	2.182	375	UNK	CIRC						
1601X	6.849		225	UNK	CIRC	4450X	5.677	4.447	225	UNK	CIRC	7701X	3.017	0.384	UNK	UNK	CIRC						
1650X	6.95	6	225	UNK	CIRC	4501X	6.443	5.108	150	UNK	CIRC	8501X	3.02		375	UNK	CIRC						
1702X	7.45		225	UNK	CIRC	4502X	5.806	4.017	225	UNK	CIRC	8502X	3.17		375	UNK	CIRC						
1751X	7.432	6.292	225	UNK	CIRC	4503X			UNK	UNK	CIRC	8601X	3.152	1.079	UNK	UNK	CIRC						
2301X			300	UNK	CIRC	4550X	5.677		225	UNK	CIRC	8703X	6.139	3.944	150	UNK	CIRC						
2302Y	3.304	2.249	UNK	UNK	CIRC	4601X	6.114	4.968	150	UNK	CIRC	8704X	3.17		200	UNK	CIRC						
2302X	3.304	2.249	300	UNK	CIRC	4650X	6.503		225	UNK	CIRC	8705X			UNK	UNK	CIRC						
2303X	4.048	2.35	300	UNK	CIRC	4651Y	5.818		225	UNK	CIRC	8706X			150	UNK	CIRC						



Drawn by:	yadavs
Title:	245484_Site surrounding Warbli
Date:	22/05/2017

APPENDIX 7



Notes

This drawing shall be read in conjunction with all other relevant Engineering, Architectural, Landscaping details, drawings and specifications and all relevant Highway Authority Plans.

Any works constructed prior to technical approval are at the contractors own risk.

All levels to be checked prior to any works undertaken. Existing surface water sewer along Warblington Road to be identified to ensure new proposed foul sewer doesn't conflict with any existing pipes.

Drainage calculations for soak-aways to Digest 365 have been undertaken by Ground & Water which has indicated that the existing ground make up is unsuitable for any type of infiltration.

Storage tanks for all plots have been calculated using Microdrainage and are designed to 1 in 100 yr storm plus 40% for climate change and discharge into the nearby existing surface water sewer controlled via hydro-brakes, restricted to 10.9l/s as indicated in the Qbar calculations.

All driveways to be permeable paving blocks

Storage tank ST1 requires 28m² x 1.0m deep
Storage tank ST2 requires 20m² x 1.0m deep
Storage tank ST3 requires 50m² x 1.0m deep

Key	
	3.5m stand-off distance for surface water system
	3m stand-off distance for foul water system
	Surface water sewer
	Surface water storage tank
	Foul water sewer



Clover House
Western Lane
Odiham
Hampshire, RG29 1TU

Tel: 01256 703355
Email: info@bellamyroberts.co.uk

CLIENT Premier Coastal Properties Ltd.		
PROJECT Warblington Road, Emsworth		
TITLE Foul and Surface Water Drainage Strategy		
DRAWN BY JCB	DESIGN BY JCB	CHK BY MT
DATE 20/05/20	DRAWING No. 5042 / 006	REV No.
SCALE 1:1000 @ A3		

APPENDIX 8

Bellamy Roberts				Page 1	
Clover House Western Lane Odiham Hants RG29 1TU		Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 1			
Date 20/05/2020 File 100YRS ST1.SRCX		Designed by JCB Checked by MT			
XP Solutions		Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	5.022	0.522	2.6	14.6	O K
30 min Summer	5.159	0.659	2.9	18.5	O K
60 min Summer	5.249	0.749	3.1	21.0	O K
120 min Summer	5.286	0.786	3.1	22.0	O K
180 min Summer	5.272	0.772	3.1	21.6	O K
240 min Summer	5.241	0.741	3.0	20.7	O K
360 min Summer	5.174	0.674	2.9	18.9	O K
480 min Summer	5.114	0.614	2.8	17.2	O K
600 min Summer	5.059	0.559	2.7	15.7	O K
720 min Summer	5.011	0.511	2.6	14.3	O K
960 min Summer	4.931	0.431	2.4	12.1	O K
1440 min Summer	4.816	0.316	2.1	8.8	O K
2160 min Summer	4.711	0.211	1.7	5.9	O K
2880 min Summer	4.650	0.150	1.5	4.2	O K
4320 min Summer	4.582	0.082	1.2	2.3	O K
5760 min Summer	4.561	0.061	1.0	1.7	O K
7200 min Summer	4.552	0.052	0.8	1.5	O K
8640 min Summer	4.546	0.046	0.7	1.3	O K
10080 min Summer	4.543	0.043	0.6	1.2	O K
15 min Winter	5.089	0.589	2.7	16.5	O K
30 min Winter	5.248	0.748	3.1	20.9	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	126.074	0.0	16.3	17	
30 min Summer	84.745	0.0	21.9	31	
60 min Summer	54.368	0.0	28.1	54	
120 min Summer	33.674	0.0	34.8	86	
180 min Summer	25.065	0.0	38.9	122	
240 min Summer	20.180	0.0	41.8	156	
360 min Summer	14.839	0.0	46.1	224	
480 min Summer	11.923	0.0	49.3	290	
600 min Summer	10.054	0.0	52.0	354	
720 min Summer	8.741	0.0	54.3	418	
960 min Summer	7.003	0.0	58.0	540	
1440 min Summer	5.114	0.0	63.5	780	
2160 min Summer	3.727	0.0	69.4	1144	
2880 min Summer	2.973	0.0	73.8	1500	
4320 min Summer	2.159	0.0	80.4	2204	
5760 min Summer	1.718	0.0	85.3	2936	
7200 min Summer	1.438	0.0	89.3	3672	
8640 min Summer	1.245	0.0	92.8	4320	
10080 min Summer	1.102	0.0	95.8	5120	
15 min Winter	126.074	0.0	18.2	17	
30 min Winter	84.745	0.0	24.5	31	
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Bellamy Roberts				Page 2	
Clover House Western Lane Odiham Hants RG29 1TU		Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 1			
Date 20/05/2020 File 100YRS ST1.SRCX		Designed by JCB Checked by MT			
XP Solutions		Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	5.357	0.857	3.3	24.0	O K
120 min Winter	5.390	0.890	3.3	24.9	O K
180 min Winter	5.363	0.863	3.3	24.2	O K
240 min Winter	5.315	0.815	3.2	22.8	O K
360 min Winter	5.214	0.714	3.0	20.0	O K
480 min Winter	5.125	0.625	2.8	17.5	O K
600 min Winter	5.048	0.548	2.7	15.3	O K
720 min Winter	4.982	0.482	2.5	13.5	O K
960 min Winter	4.878	0.378	2.2	10.6	O K
1440 min Winter	4.744	0.244	1.8	6.8	O K
2160 min Winter	4.641	0.141	1.4	3.9	O K
2880 min Winter	4.587	0.087	1.2	2.4	O K
4320 min Winter	4.556	0.056	0.9	1.6	O K
5760 min Winter	4.546	0.046	0.7	1.3	O K
7200 min Winter	4.541	0.041	0.6	1.1	O K
8640 min Winter	4.537	0.037	0.5	1.0	O K
10080 min Winter	4.535	0.035	0.5	1.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.368	0.0	31.5	58	
120 min Winter	33.674	0.0	39.0	92	
180 min Winter	25.065	0.0	43.6	130	
240 min Winter	20.180	0.0	46.8	168	
360 min Winter	14.839	0.0	51.6	240	
480 min Winter	11.923	0.0	55.3	308	
600 min Winter	10.054	0.0	58.3	374	
720 min Winter	8.741	0.0	60.8	438	
960 min Winter	7.003	0.0	64.9	560	
1440 min Winter	5.114	0.0	71.1	806	
2160 min Winter	3.727	0.0	77.7	1148	
2880 min Winter	2.973	0.0	82.7	1528	
4320 min Winter	2.159	0.0	90.1	2204	
5760 min Winter	1.718	0.0	95.6	2928	
7200 min Winter	1.438	0.0	100.0	3544	
8640 min Winter	1.245	0.0	103.9	4296	
10080 min Winter	1.102	0.0	107.3	5056	
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Bellamy Roberts		Page 3
Clover House Western Lane Odiham Hants RG29 1TU	Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 1	
Date 20/05/2020 File 100YRS ST1.SRCX	Designed by JCB Checked by MT	
XP Solutions Source Control 2017.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.069

Time (mins)	Area
From: To:	(ha)
0 4	0.069

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Bellamy Roberts		Page 4
Clover House Western Lane Odiham Hants RG29 1TU	Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 1	
Date 20/05/2020 File 100YRS ST1.SRCX	Designed by JCB Checked by MT	
XP Solutions Source Control 2017.1		

Model Details

Storage is Online Cover Level (m) 6.500

Tank or Pond Structure

Invert Level (m) 4.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	28.0	1.000	28.0	1.100	0.0	2.000	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SCU-0058-3500-1000-3500
Design Head (m)	1.000
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Linear discharge profile
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	4.500
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.5
Flush-Flo™	0.078	1.2
Kick-Flo®	0.086	1.2
Mean Flow over Head Range	-	2.4

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 (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	1.200	3.8	3.000	5.9	7.000	8.8
0.200	1.7	1.400	4.1	3.500	6.3	7.500	9.1
0.300	2.0	1.600	4.4	4.000	6.7	8.000	9.3
0.400	2.3	1.800	4.6	4.500	7.1	8.500	9.6
0.500	2.5	2.000	4.8	5.000	7.5	9.000	9.9
0.600	2.8	2.200	5.1	5.500	7.8	9.500	10.1
0.800	3.2	2.400	5.3	6.000	8.1		
1.000	3.5	2.600	5.5	6.500	8.5		

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Bellamy Roberts					Page 1	
Clover House Western Lane Odiham Hants RG29 1TU			Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 2			
Date 20/05/2020 File 100YRS ST2.SRCX			Designed by JCB Checked by MT			
XP Solutions			Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>						
	Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
	15 min Summer	3.386	0.586	2.7	11.7	O K
	30 min Summer	3.525	0.725	3.0	14.5	O K
	60 min Summer	3.608	0.808	3.2	16.2	O K
	120 min Summer	3.627	0.827	3.2	16.5	O K
	180 min Summer	3.594	0.794	3.1	15.9	O K
	240 min Summer	3.547	0.747	3.1	14.9	O K
	360 min Summer	3.458	0.658	2.9	13.2	O K
	480 min Summer	3.383	0.583	2.7	11.7	O K
	600 min Summer	3.318	0.518	2.6	10.4	O K
	720 min Summer	3.263	0.463	2.5	9.3	O K
	960 min Summer	3.175	0.375	2.2	7.5	O K
	1440 min Summer	3.059	0.259	1.9	5.2	O K
	2160 min Summer	2.962	0.162	1.5	3.2	O K
	2880 min Summer	2.909	0.109	1.3	2.2	O K
	4320 min Summer	2.864	0.064	1.0	1.3	O K
	5760 min Summer	2.851	0.051	0.8	1.0	O K
	7200 min Summer	2.845	0.045	0.7	0.9	O K
	8640 min Summer	2.841	0.041	0.6	0.8	O K
	10080 min Summer	2.838	0.038	0.5	0.8	O K
	15 min Winter	3.463	0.663	2.9	13.3	O K
	30 min Winter	3.626	0.826	3.2	16.5	O K
	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
	15 min Summer	126.074	0.0	13.5	17	
	30 min Summer	84.745	0.0	18.1	31	
	60 min Summer	54.368	0.0	23.2	48	
	120 min Summer	33.674	0.0	28.8	82	
	180 min Summer	25.065	0.0	32.1	118	
	240 min Summer	20.180	0.0	34.5	152	
	360 min Summer	14.839	0.0	38.1	218	
	480 min Summer	11.923	0.0	40.8	282	
	600 min Summer	10.054	0.0	43.0	344	
	720 min Summer	8.741	0.0	44.8	406	
	960 min Summer	7.003	0.0	47.9	528	
	1440 min Summer	5.114	0.0	52.5	766	
	2160 min Summer	3.727	0.0	57.3	1124	
	2880 min Summer	2.973	0.0	61.0	1472	
	4320 min Summer	2.159	0.0	66.4	2200	
	5760 min Summer	1.718	0.0	70.5	2936	
	7200 min Summer	1.438	0.0	73.8	3608	
	8640 min Summer	1.245	0.0	76.6	4360	
	10080 min Summer	1.102	0.0	79.1	5080	
	15 min Winter	126.074	0.0	15.1	17	
	30 min Winter	84.745	0.0	20.3	30	
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Bellamy Roberts				Page 2	
Clover House Western Lane Odiham Hants RG29 1TU		Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 2			
Date 20/05/2020 File 100YRS ST2.SRCX		Designed by JCB Checked by MT			
XP Solutions		Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	3.719	0.919	3.4	18.4	O K
120 min Winter	3.729	0.929	3.4	18.6	O K
180 min Winter	3.673	0.873	3.3	17.5	O K
240 min Winter	3.600	0.800	3.2	16.0	O K
360 min Winter	3.469	0.669	2.9	13.4	O K
480 min Winter	3.363	0.563	2.7	11.3	O K
600 min Winter	3.276	0.476	2.5	9.5	O K
720 min Winter	3.206	0.406	2.3	8.1	O K
960 min Winter	3.102	0.302	2.0	6.0	O K
1440 min Winter	2.980	0.180	1.6	3.6	O K
2160 min Winter	2.896	0.096	1.2	1.9	O K
2880 min Winter	2.864	0.064	1.0	1.3	O K
4320 min Winter	2.848	0.048	0.7	1.0	O K
5760 min Winter	2.841	0.041	0.6	0.8	O K
7200 min Winter	2.836	0.036	0.5	0.7	O K
8640 min Winter	2.833	0.033	0.4	0.7	O K
10080 min Winter	2.831	0.031	0.4	0.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.368	0.0	26.0	52	
120 min Winter	33.674	0.0	32.2	90	
180 min Winter	25.065	0.0	36.0	126	
240 min Winter	20.180	0.0	38.6	162	
360 min Winter	14.839	0.0	42.6	230	
480 min Winter	11.923	0.0	45.7	296	
600 min Winter	10.054	0.0	48.1	360	
720 min Winter	8.741	0.0	50.2	422	
960 min Winter	7.003	0.0	53.6	542	
1440 min Winter	5.114	0.0	58.8	780	
2160 min Winter	3.727	0.0	64.2	1144	
2880 min Winter	2.973	0.0	68.3	1468	
4320 min Winter	2.159	0.0	74.4	2192	
5760 min Winter	1.718	0.0	79.0	2880	
7200 min Winter	1.438	0.0	82.6	3560	
8640 min Winter	1.245	0.0	85.8	4384	
10080 min Winter	1.102	0.0	88.6	5136	
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Bellamy Roberts		Page 3
Clover House Western Lane Odiham Hants RG29 1TU	Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 2	
Date 20/05/2020 File 100YRS ST2.SRCX	Designed by JCB Checked by MT	
XP Solutions Source Control 2017.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.057

Time (mins)	Area
From: To:	(ha)
0 4	0.057

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Bellamy Roberts		Page 4
Clover House Western Lane Odiham Hants RG29 1TU	Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 2	
Date 20/05/2020 File 100YRS ST2.SRCX	Designed by JCB Checked by MT	
XP Solutions Source Control 2017.1		

Model Details

Storage is Online Cover Level (m) 4.800

Tank or Pond Structure

Invert Level (m) 2.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	20.0	1.000	20.0	1.100	0.0	2.000	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SCU-0058-3500-1000-3500
Design Head (m)	1.000
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Linear discharge profile
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	2.800
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.5
Flush-Flo™	0.078	1.2
Kick-Flo®	0.086	1.2
Mean Flow over Head Range	-	2.4

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 (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	1.200	3.8	3.000	5.9	7.000	8.8
0.200	1.7	1.400	4.1	3.500	6.3	7.500	9.1
0.300	2.0	1.600	4.4	4.000	6.7	8.000	9.3
0.400	2.3	1.800	4.6	4.500	7.1	8.500	9.6
0.500	2.5	2.000	4.8	5.000	7.5	9.000	9.9
0.600	2.8	2.200	5.1	5.500	7.8	9.500	10.1
0.800	3.2	2.400	5.3	6.000	8.1		
1.000	3.5	2.600	5.5	6.500	8.5		

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Bellamy Roberts				Page 1	
Clover House Western Lane Odiham Hants RG29 1TU		Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 3			
Date 20/05/2020 File 100YRS ST3.SRCX		Designed by JCB Checked by MT			
XP Solutions		Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	2.515	0.515	2.9	25.7	O K
30 min Summer	2.663	0.663	3.3	33.2	O K
60 min Summer	2.784	0.784	3.6	39.2	O K
120 min Summer	2.845	0.845	3.7	42.2	O K
180 min Summer	2.853	0.853	3.7	42.7	O K
240 min Summer	2.841	0.841	3.7	42.1	O K
360 min Summer	2.801	0.801	3.6	40.1	O K
480 min Summer	2.756	0.756	3.5	37.8	O K
600 min Summer	2.712	0.712	3.4	35.6	O K
720 min Summer	2.671	0.671	3.3	33.5	O K
960 min Summer	2.596	0.596	3.1	29.8	O K
1440 min Summer	2.477	0.477	2.8	23.9	O K
2160 min Summer	2.354	0.354	2.5	17.7	O K
2880 min Summer	2.271	0.271	2.2	13.6	O K
4320 min Summer	2.172	0.172	1.8	8.6	O K
5760 min Summer	2.116	0.116	1.5	5.8	O K
7200 min Summer	2.080	0.080	1.4	4.0	O K
8640 min Summer	2.068	0.068	1.2	3.4	O K
10080 min Summer	2.060	0.060	1.1	3.0	O K
15 min Winter	2.579	0.579	3.1	28.9	O K
30 min Winter	2.749	0.749	3.5	37.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	126.074	0.0	27.6	18	
30 min Summer	84.745	0.0	37.1	32	
60 min Summer	54.368	0.0	47.7	60	
120 min Summer	33.674	0.0	59.1	98	
180 min Summer	25.065	0.0	66.0	130	
240 min Summer	20.180	0.0	70.8	166	
360 min Summer	14.839	0.0	78.1	234	
480 min Summer	11.923	0.0	83.7	302	
600 min Summer	10.054	0.0	88.2	370	
720 min Summer	8.741	0.0	92.0	436	
960 min Summer	7.003	0.0	98.3	566	
1440 min Summer	5.114	0.0	107.7	820	
2160 min Summer	3.727	0.0	117.7	1188	
2880 min Summer	2.973	0.0	125.2	1532	
4320 min Summer	2.159	0.0	136.3	2248	
5760 min Summer	1.718	0.0	144.7	2952	
7200 min Summer	1.438	0.0	151.4	3672	
8640 min Summer	1.245	0.0	157.3	4400	
10080 min Summer	1.102	0.0	162.4	5136	
15 min Winter	126.074	0.0	30.9	18	
30 min Winter	84.745	0.0	41.6	32	
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Bellamy Roberts				Page 2	
Clover House Western Lane Odiham Hants RG29 1TU		Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 3			
Date 20/05/2020 File 100YRS ST3.SRCX		Designed by JCB Checked by MT			
XP Solutions		Source Control 2017.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	2.893	0.893	3.8	44.6	O K
120 min Winter	2.964	0.964	3.9	48.2	O K
180 min Winter	2.968	0.968	3.9	48.4	O K
240 min Winter	2.948	0.948	3.9	47.4	O K
360 min Winter	2.885	0.885	3.8	44.3	O K
480 min Winter	2.817	0.817	3.6	40.9	O K
600 min Winter	2.751	0.751	3.5	37.6	O K
720 min Winter	2.690	0.690	3.4	34.5	O K
960 min Winter	2.585	0.585	3.1	29.2	O K
1440 min Winter	2.427	0.427	2.7	21.4	O K
2160 min Winter	2.281	0.281	2.2	14.0	O K
2880 min Winter	2.194	0.194	1.9	9.7	O K
4320 min Winter	2.104	0.104	1.4	5.2	O K
5760 min Winter	2.068	0.068	1.2	3.4	O K
7200 min Winter	2.057	0.057	1.0	2.9	O K
8640 min Winter	2.051	0.051	0.9	2.5	O K
10080 min Winter	2.046	0.046	0.8	2.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	54.368	0.0	53.4	60	
120 min Winter	33.674	0.0	66.2	112	
180 min Winter	25.065	0.0	73.9	140	
240 min Winter	20.180	0.0	79.3	178	
360 min Winter	14.839	0.0	87.5	254	
480 min Winter	11.923	0.0	93.7	326	
600 min Winter	10.054	0.0	98.8	396	
720 min Winter	8.741	0.0	103.1	464	
960 min Winter	7.003	0.0	110.1	598	
1440 min Winter	5.114	0.0	120.6	852	
2160 min Winter	3.727	0.0	131.8	1212	
2880 min Winter	2.973	0.0	140.2	1560	
4320 min Winter	2.159	0.0	152.7	2288	
5760 min Winter	1.718	0.0	162.1	2936	
7200 min Winter	1.438	0.0	169.6	3648	
8640 min Winter	1.245	0.0	176.2	4344	
10080 min Winter	1.102	0.0	181.9	5136	
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Bellamy Roberts		Page 3
Clover House Western Lane Odiham Hants RG29 1TU	Premier Coastal Properties Ltd Warblington Road, Emsworth Storage Tank 3	
Date 20/05/2020 File 100YRS ST3.SRCX	Designed by JCB Checked by MT	
XP Solutions Source Control 2017.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.117

Time (mins)	Area
From: To:	(ha)
0	4 0.117

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Bellamy Roberts				Page 4																																																																																																								
Clover House		Premier Coastal Properties Ltd																																																																																																										
Western Lane		Warblington Road, Emsworth																																																																																																										
Odiham Hants RG29 1TU		Storage Tank 3																																																																																																										
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File 100YRS ST3.SRCX		Checked by MT																																																																																																										
XP Solutions		Source Control 2017.1																																																																																																										
Model Details Storage is Online Cover Level (m) 4.000 Tank or Pond Structure Invert Level (m) 2.000 <table><tr><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td><td>Depth (m)</td><td>Area (m²)</td></tr><tr><td>0.000</td><td>50.0</td><td>1.000</td><td>50.0</td><td>1.100</td><td>0.0</td><td>2.000</td><td>0.0</td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SCU-0062-4000-1000-4000 Design Head (m) 1.000 Design Flow (l/s) 4.0 Flush-Flo™ Calculated Objective Linear discharge profile Application Surface Sump Available Yes Diameter (mm) 62 Invert Level (m) 2.000 Minimum Outlet Pipe Diameter (mm) 75 Suggested Manhole Diameter (mm) 1200 Control Points <table><tr><td></td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>4.0</td></tr><tr><td>Flush-Flo™</td><td>0.089</td><td>1.4</td></tr><tr><td>Kick-Flo®</td><td>0.093</td><td>1.4</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>2.7</td></tr></table> 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 <table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>1.4</td><td>1.200</td><td>4.4</td><td>3.000</td><td>6.7</td><td>7.000</td><td>10.0</td></tr><tr><td>0.200</td><td>1.9</td><td>1.400</td><td>4.7</td><td>3.500</td><td>7.2</td><td>7.500</td><td>10.4</td></tr><tr><td>0.300</td><td>2.3</td><td>1.600</td><td>5.0</td><td>4.000</td><td>7.7</td><td>8.000</td><td>10.7</td></tr><tr><td>0.400</td><td>2.6</td><td>1.800</td><td>5.3</td><td>4.500</td><td>8.1</td><td>8.500</td><td>11.0</td></tr><tr><td>0.500</td><td>2.9</td><td>2.000</td><td>5.5</td><td>5.000</td><td>8.5</td><td>9.000</td><td>11.3</td></tr><tr><td>0.600</td><td>3.2</td><td>2.200</td><td>5.8</td><td>5.500</td><td>8.9</td><td>9.500</td><td>11.6</td></tr><tr><td>0.800</td><td>3.6</td><td>2.400</td><td>6.0</td><td>6.000</td><td>9.3</td><td></td><td></td></tr><tr><td>1.000</td><td>4.0</td><td>2.600</td><td>6.3</td><td>6.500</td><td>9.7</td><td></td><td></td></tr></table>						Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	50.0	1.000	50.0	1.100	0.0	2.000	0.0		Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	4.0	Flush-Flo™	0.089	1.4	Kick-Flo®	0.093	1.4	Mean Flow over Head Range	-	2.7	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	1.4	1.200	4.4	3.000	6.7	7.000	10.0	0.200	1.9	1.400	4.7	3.500	7.2	7.500	10.4	0.300	2.3	1.600	5.0	4.000	7.7	8.000	10.7	0.400	2.6	1.800	5.3	4.500	8.1	8.500	11.0	0.500	2.9	2.000	5.5	5.000	8.5	9.000	11.3	0.600	3.2	2.200	5.8	5.500	8.9	9.500	11.6	0.800	3.6	2.400	6.0	6.000	9.3			1.000	4.0	2.600	6.3	6.500	9.7		
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