Land West of Old Manor Farm, South of Lower Road, Bedhampton

Drainage Strategy Technical Note

Planning App: APP/21/01071
MJA Reference: SS/23/0157/6430
13th November 2024

Revision E

Introduction

1.1 MJA Consulting was appointed to prepare a drainage strategy for the disposal of surface water from the proposed development, incorporating the principles of Sustainable Drainage Systems (SuDS) and in accordance with Environment Agency guidance, The National Planning Policy Framework (NPPF) and through liaison with Hampshire County Council.

1.2 MJA Consulting previously prepared a drainage strategy for the development directly east of the site, under application APP/20/01031 (Land south of Lower Road, Havant) also known as Phase 1. The drainage strategy was approved by the Environment Agency (EA), Lead Local Flood Authority (LLFA) and Local Planning Authority (LPA). Due to the similarities between the two sites, namely in terms of topography and geology, it was proposed to mimic the drainage strategy for this site. However, after the LLFA raised concerns about the suitability of a strategy that utilised deep borehole soakaways to discharge the surface water, we then proposed an alternative method for discharging runoff by following the drainage hierarchy.

1.3 Since infiltration was not feasible on site, the next option in the drainage hierarchy is discharge to a local watercourse. In an email on the 26th January 2024, the LLFA (Sarah Reghif) confirmed in principle the alternate option of discharging the attenuated surface water runoff to the ditch in the south-west corner of the site.

"We would always prefer a gravity system over a pumped system and if the pipe is connecting to the same discharge point (so water isn't being directed to a new catchment) we wouldn't have any issues with this."

Surface Water Strategy and SuDS Assessment

2.1 On Phase 2 (Land west of Old Manor Farm) it is proposed to use a combination of swales and an attenuation basin to ensure sufficient water pollution mitigation to the receiving waterbody. A brief outline of how the proposed impermeable surfaces will drain as well as a description of the drainage features are listed below.

Roads

2.2 The roads will be a combination of impermeable macadam and impermeable block paving. The roads will drain either via flush kerbs and stone spillways into roadside swales or by gullies directly into the swales or pipe network.

Roadside Swales

2.3 The roadside swales would vary in depth from 0.3 m to 0.5 m and would be 2.5-3.0 m wide. The primary function of the swales is to provide shallow infiltration for the road run off and primary treatment for any hydrocarbons washed off from the carriageway. A vertical gravel trench will be provided in the base of the swale for conveyance of exceedance flows to perforated pipework laid in the base of the trench. The perforated pipework will either infiltrate the runoff to ground or convey the runoff to the next swale and so on until ultimately it reaches the attenuation basin. The pipework within the swales has been sized to ignore the effects of any infiltration.

Shared surface car parking areas

2.4 These areas drain via permeable block paving through to a permeable subbase. Hydrocarbon removal from run off takes place within the stone bedding layer of the block paving and the subbase itself. Run off that cannot infiltrate to ground is collected via permavoid collectors and directed towards the pipework located at the base of the sub-base/swales. This runoff ultimately makes its way to the attenuation basin.

Houses

2.5 The houses drain via gravity to either the permeable subbase of the shared surface car parking areas via permavoid distributors or directly into the pipework located within the base of the swales. This runoff ultimately makes its way to the attenuation basin.

Attenuation basin

2.6 The attenuation basin has been sized to ignore any potential infiltration that may have taken place upstream via the roadside swales or perforated pipework, as well as any infiltration within the unlined basin itself. All infiltration within the design calculation parameters has been set to zero. The basin is sized to attenuate the runoff from the development for all storm events up to, and including, the 1:100 year + 45% climate change event with an allowance for a minimum 300mm freeboard over and above this design level. The required volume to achieve this is 848m^3. Discharge from the basin is via a headwall and pipework located to the south-west side.

Hydrobrake control chamber

2.7 Flow into the treatment features and pump station will be regulated via a Hydrobrake situated within the flow control chamber. The flows will be limited to 3.3 l/s for all storm events up to, and including, the 1:100 year + 45%. This matches the greenfield runoff rate for the site which was calculated using the total proposed impermeable surface area. Please see appendices for calculations.

Outfall

2.8 Following the drainage hierarchy, infiltration would be the first method of disposal for the runoff. However, infiltration tests proved insufficient to utilise soakaway features at shallow depths. Deep borehole soakaways are also discouraged. There is a watercourse that lies to the south west corner of the site, but not within the site boundary, which is culverted under the railway line. This watercourse runs north to south. The site naturally drains to this ditch via overland flow and field drains. Discharging the sites' runoff to this ditch would mimic greenfield conditions.

2.9 The ditch is adjacent to the site boundary with various field drains from site outfalling along its length. These perforated plastic drainpipes are 50mm and 75mm diameter which are too small and unsuitable to utilise as part of the onsite drainage system. Therefore, it is proposed to utilise overland flow across a short distance from the site boundary into the ditch, mimicking greenfield conditions. The control chamber following the basin will discharge into a 110m swale leading down to the south west corner of the site. The downstream end of the swale contains a small basin with a permanently wet depth, as well as weir in the form of a 4m wide and 0.4m cut into the bank. This weir allows the maximum discharge of 3.3l/s to spill out and into the ditch. This strategy was confirmed acceptable in principle by the LLFA in their email to Stewart Smith of MJA Consulting and Suzannah Duke of Bargate Homes on the 26th January 2024.

Gas Main Easement

2.10 The outfall swale must cross a high pressure (HP) gas main, an SGN asset. SGN set out their requirements for development or works close to their pipeline in an email dated 16th September 2024. They stated that crossing the HP pipe is permitted within certain parameters. There must be 600mm clearance for any services and they must cross the pipeline perpendicular or within 15 degrees of perpendicular. Drainage ponds should be a minimum of 15 meters away so as not to impact the ground supporting the HP. Any work carried out within 3 metres of the HP pipeline needs to be supervised by an SGN engineer. Trial holes in October 2023 confirmed that the pipeline was 1.8m to 2.0m.

2.11 SGN's consultation response on the planning application states *"There are high pressure pipelines in the vicinity of your proposed work area. SGN formally object to this planning application until such time as a detail consultation has taken place."* Therefore, a detailed consultation to obtain written approval for the works is required before any construction on site starts. Once approval has been granted, SGN will also be given advance notice of commencement of works so they can supervise as they require.

Water Main Easement

2.12 Portsmouth Water provides potable water to the area, and sewerage is provided by Southern Water. The outfall swale must also cross a 450mm trunk water main, a Portsmouth Water asset. Guidance has been issued by Portsmouth Water for working near or over a trunk water main. No work whatsoever shall commence on or adjacent to any trunk water main before full consent has been granted by Portsmouth Water regarding the process in which the work shall be progressed and completed. At least 10 working days' notice will be given of any intention of such works.

2.13 No building of any description shall be erected on or adjacent to the pipeline. No materials including spoil shall be stored on or adjacent to the pipeline and access to and along the route of the pipeline shall be kept clear and unrestricted at all times. No trees shall be planted or allowed to grow on or adjacent to the route of the pipeline.

2.14 Any pipes, drains or sewers crossing over the pipeline shall be laid in steel or ductile iron (or other suitable material) and shall cross as near as possible to 90° to the line of the main. A minimum of 300mm of clearance must be given to any crossing above or below the pipeline.

2.15 Excavation around or beneath the pipeline must be completed by hand and great care exercised to ensure that any protective wrapping is not damaged. Excavations shall be fully supported and shall be backfilled to the satisfaction of Portsmouth Water. Safe digging practices in accordance with HSE publication HSG47 "Avoiding Danger from Underground Services" must be used to verify and establish the actual position of the mains, pipes, services and other apparatus on site before any mechanical plant is used.

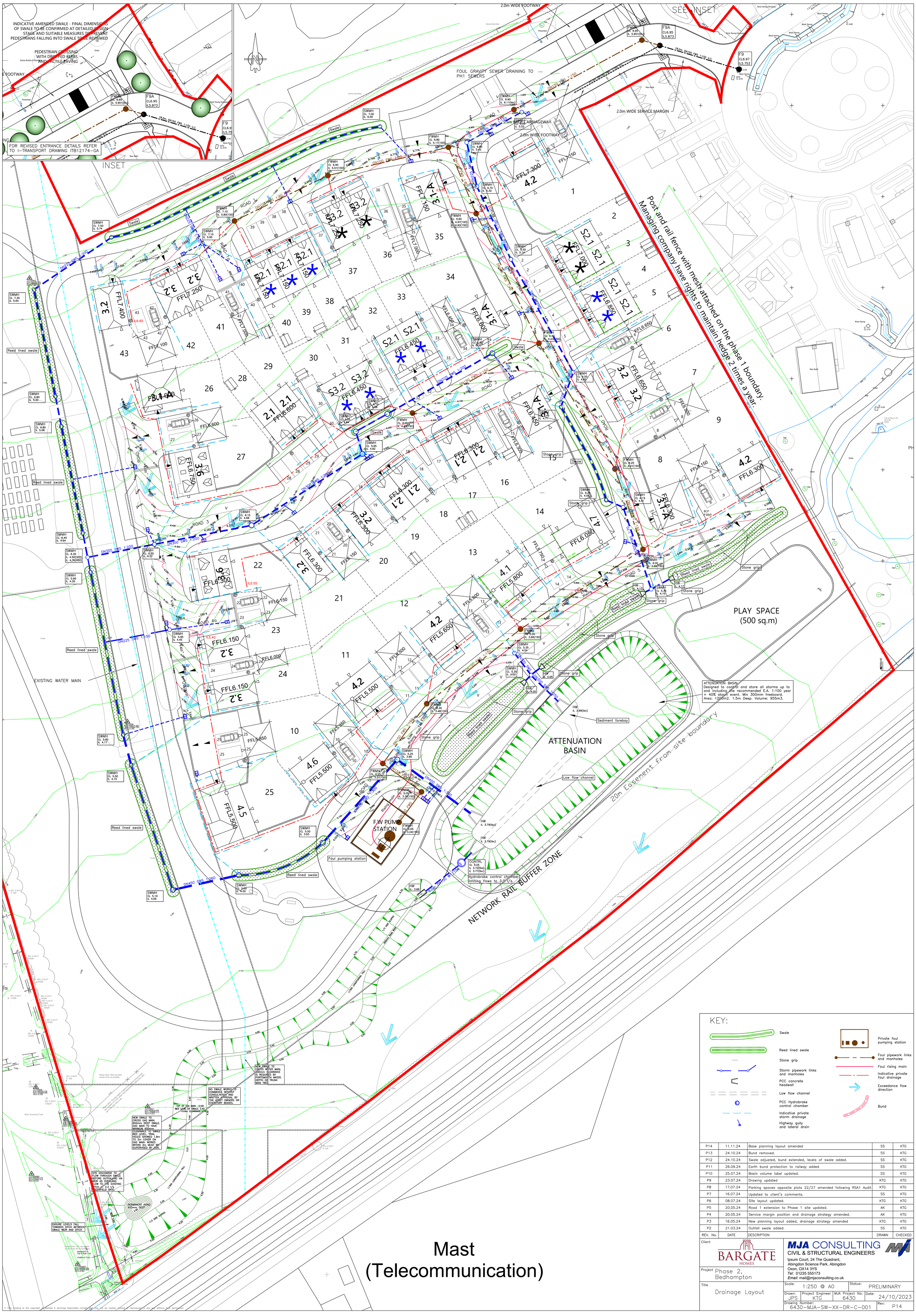
2.16 Any proposed alterations to existing ground levels on or adjacent to the pipeline must be agreed and approved by Portsmouth Water. The movement of vehicles and plant of a total weight exceeding 6 tonnes across the unprotected pipeline is forbidden. The repetitive movement of vehicles or plant of any weight over the unprotected main is forbidden.

2.17 Portsmouth Water have already been consulted regarding the development's impact on groundwater quality and have stated in a letter (Appendix B) that they have no concerns as the site lies outside of any Source Protection Zones.

Appendices

Appendix A – Drainage Strategy
Appendix B – Southern Water Sewer Records and Portsmouth Water Letter
Appendix C – Greenfield Runoff Calculations
Appendix D – Surface Water Network Calculations

Appendix A – Drainage Strategy



KEY:

- Swale
- Reed lined swale
- Stone grip
- Storm pipework links and manholes
- PCC concrete headwall
- Low flow channel
- PCC Hydrobrake control chamber
- Indicative private storm drainage
- Highway gully and lateral drain
- Private foul pumping station
- Foul pipework links and manholes
- Foul rising main
- Indicative private foul drainage
- Exceedance flow direction
- Bund

REV. No.	DATE	DESCRIPTION	DRAWN	CHECKED
P14	11.11.24	Base planning layout amended	SS	KTG
P13	24.10.24	Bund removed.	SS	KTG
P12	24.10.24	Swale adjusted, bund extended, levels of swale added.	SS	KTG
P11	26.09.24	Earth bund protection to railway added	SS	KTG
P10	25.07.24	Basin volume label updated.	SS	KTG
P9	23.07.24	Drawing updated	KTG	KTG
P8	17.07.24	Parking spaces opposite plots 22/27 amended following RSA1 Audit	KTG	KTG
P7	16.07.24	Updated to client's comments.	SS	KTG
P6	08.07.24	Site layout updated.	KTG	KTG
P5	20.05.24	Road 1 extension to Phase 1 site updated.	AK	KTG
P4	20.05.24	Service margin position and drainage strategy amended.	AK	KTG
P3	16.05.24	New planning layout added, drainage strategy amended	KTG	KTG
P2	21.03.24	Outfall swale added.	SS	KTG

Client: BARGATE HOMES

Project: Phase 2, Bedhampton

Title: Drainage Layout

MJA CONSULTING
CIVIL & STRUCTURAL ENGINEERS
Ipsum Court, 24 The Quadrant,
Abingdon Science Park, Abingdon
Oxon, OX14 3YS
Tel: 01235 555173
Email: mail@mjaconsulting.co.uk

Scale: 1:250 @ A0			Status: PRELIMINARY
Drawn: JPS	Project Engineer: KTG	MJA Project No: 6430	Date: 24/10/2023
Drawing Number: 6430-MJA-SW-XX-DR-C-001			Rev: P14

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Appendix B – Southern Water Sewer Records and Portsmouth Water Letter

SEWER RECORDS PAGE 1 OF 2

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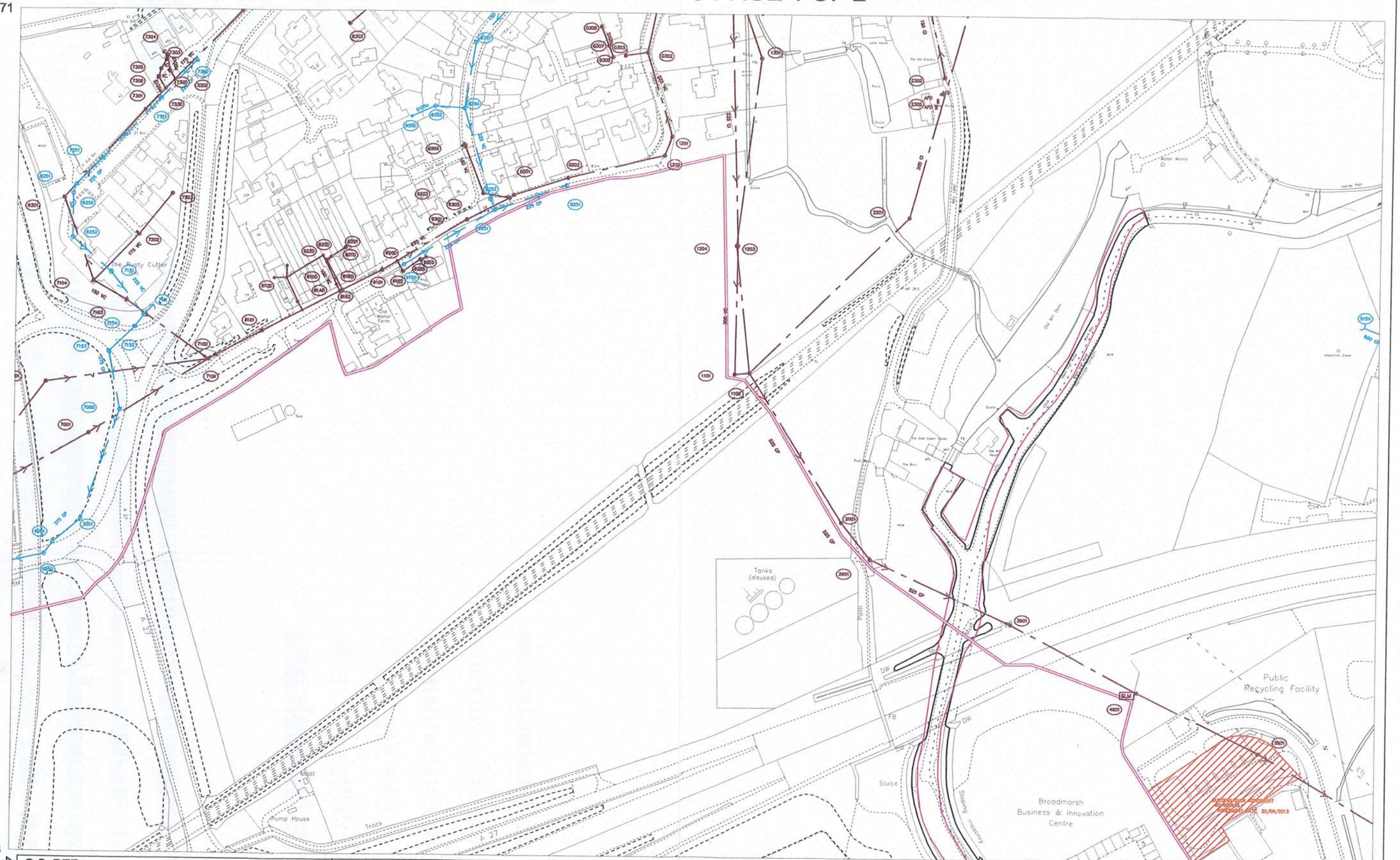

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469656

470601

O.S. REF. SU7006SW	Drawn by: mondaln	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 determnined on site.
	Scale: 1:2500	WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement
Title: Land at Manor Farm Lower Road	Date: 23/06/2015	Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.

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Southern Water

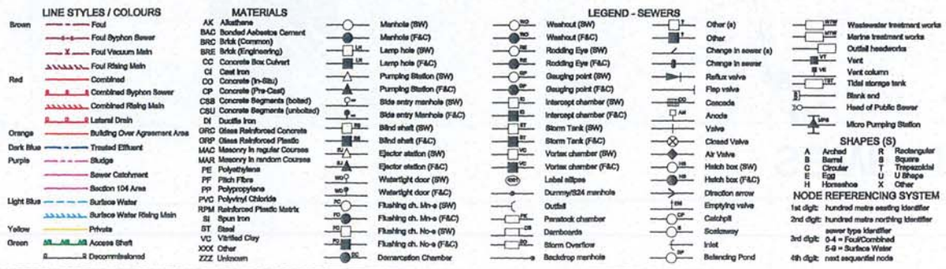
SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	
0201X	9.3	6.73	225	VC	CIRC	
0202X	8.89		UNK	UNK	CIRC	
0251X	8.8	8.29	150	CI	CIRC	
0302X	8.37	6.16	225	VC	CIRC	
0303X			UNK	UNK	UNK	
0305X			UNK	UNK	CIRC	
0307X			UNK	UNK	CIRC	
1101X	6.99	3.87	300	VC	CIRC	
1102X	6.86	3.08	525	CP	CIRC	
1201X	8.25	6.28	225	VC	CIRC	
1202X	8.14		UNK	UNK	CIRC	
1203X	7.28	4.05	300	VC	CIRC	
1204X	6.84		UNK	UNK	CIRC	
1301X	6.66		UNK	UNK	CIRC	
2001X	4.7	2.63	525	CP	CIRC	
2201X	4.28		UNK	UNK	CIRC	
2302X	7.06	6.54	150	CI	CIRC	
2901X	3.65	2.48	525	CP	CIRC	
3901X	3.25		OTHER	CP	CIRC	
4901X	2.84		UNK	UNK	CIRC	
5801X	3.01	0.11	OTHER	CP	CIRC	
6051X	10.09	7.8	375	CP	CIRC	
6101X	18.76	7.93	300	CP	CIRC	
6201X	20.65		175	VC	CIRC	
6250X	20.69	19.83	225	VC	CIRC	
6251X	20.78	19.86	225	CP	CIRC	
6252X	19.34	18.1	225	VC	CIRC	
7950X	10.05		UNK	UNK	UNK	
7001X	14.16	7.84	225	VC	CIRC	
7050X	12.62	9.73	375	CP	CIRC	
7051X	10.52	8.88	375	CP	CIRC	
7101X	12.76	7.55	225	VC	CIRC	
7102X	12.99	7.51	225	VC	CIRC	
7103X	14.66	11.26	150	VC	CIRC	
7104X	16.7	14.14	150	VC	CIRC	*
7104Y	16.7		UNK	UNK	CIRC	*
7151X	16.53	15.05	225	VC	CIRC	
7152X	13.08	11.13	225	VC	CIRC	
7153X	13.23	10.63	375	CP	CIRC	
7154X	13.12	11.58	225	VC	CIRC	
7151X	11.16		225	VC	CIRC	
7202X	16.59	14.87	175	VC	CIRC	
7203X			UNK	UNK	CIRC	
7251X	21.57	20.75	225	CP	CIRC	
7301X	22.4	21.21	175	VC	CIRC	
7302X			UNK	UNK	CIRC	
7303X			UNK	UNK	CIRC	*
7303Y			UNK	UNK	CIRC	*
7304X			UNK	UNK	CIRC	
7305X			UNK	UNK	CIRC	
7306X			UNK	UNK	CIRC	
732DX			175	VC	CIRC	
733DX			175	VC	CIRC	
7350X	23.11	21.89	225	CP	CIRC	
7351X	22.19	21.35	225	CP	CIRC	
8101X	10.86		225	VC	CIRC	
8102X			225	VC	CIRC	
810DX			UNK	UNK	CIRC	
811DX			UNK	UNK	CIRC	
812DX			UNK	UNK	CIRC	
813DY			225	VC	CIRC	*
813DX			UNK	UNK	CIRC	*
814DX			225	VC	CIRC	
81ADX	10.32	8.85	100	VC	CIRC	
81BDX	10.35		100	VC	CIRC	

Node	Cover	Invert	Size	Material	Shape	
81CDX	11.035		UNK	UNK	CIRC	
81DDX	10.67	9.37	100	VC	CIRC	*
81DDY	10.67		UNK	UNK	CIRC	*
8201X	10.92	10.43	100	VC	CIRC	
820DX	10.62	9.36	100	VC	CIRC	
821DX	10.81	9.68	100	VC	CIRC	
822DX	10.91	10.91	UNK	VC	CIRC	
8302X	18.89		UNK	UNK	CIRC	
9101X	9.19	7.13	225	VC	CIRC	
9102X			UNK	UNK	CIRC	
9150X	9.06	8.45	225	CP	CIRC	
9201X	9.22	6.95	225	VC	CIRC	
9202X	9.81	8.07	150	VC	CIRC	
9203X	9.22	6.79	225	VC	CIRC	
9204X	11.56	8.76	150	VC	CIRC	
9205X			UNK	UNK	CIRC	
920DX			225	VC	CIRC	
921DX			UNK	UNK	CIRC	
9251X	9.37	8.86	225	CP	CIRC	
9252X	9.57	8.86	225	VC	CIRC	
925DX			UNK	UNK	CIRC	
9350X	12.67	11.36	225	VC	CIRC	
9351X	14.01	12.08	150	VC	CIRC	
9352X			UNK	UNK	CIRC	

Node	Cover	Invert	Size	Material	Shape

Node	Cover	Invert	Size	Material	Shape



Drawn by: mondaln	Southern Water
Title: Land at Manor Farm Lower Road	
Date: 23/06/2015	

Good Afternoon,

Portsmouth Water have reviewed the application for APP/24/00612 and have no concerns regarding impacts to groundwater quality, as the location is outside our Source Protection Zone boundaries. We have no further comments to make,

Kind Regards,

Catchment & Environment Team
Portsmouth Water

Tel: Direct dial: 02392 249248
Web: portsmouthwater.co.uk

Excellence | Integrity | Future Focus

08:30 – 16:45 Mon - Thurs
08:30 – 16:00 Friday

Small changes make big impact.
Please consider the environment before printing this email.

Appendix C – Greenfield Runoff Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	0.920	Urban	0.000
SAAR (mm)	729	Region Number	Region 7

Results	**l/s**
QBAR Rural	3.3
QBAR Urban	3.3
Q100 years	10.5
Q1 year	2.8
Q30 years	7.4
Q100 years	10.5

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FEH Mean Annual Flood

Input

QMED Method	1999
Site Location GB 470300 105900 SU 70300 05900	
Area (ha)	0.920
SAAR (mm)	780
URBEXT (2000)	0.2408
SPRHOST	44.850
BFIHOST	0.274
FARL	0.992

Results

QMED Rural (l/s) 3.4 QMED Urban (l/s) 4.4

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Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.500
Ratio R	0.349
Areal Reduction Factor	1.00
Area (ha)	0.920
SAAR (mm)	789
CWI	116.484
Urban	0.000
SPR	47.000

Results

Percentage Runoff (%)	49.10
Greenfield Runoff Volume (m^3)	291.412

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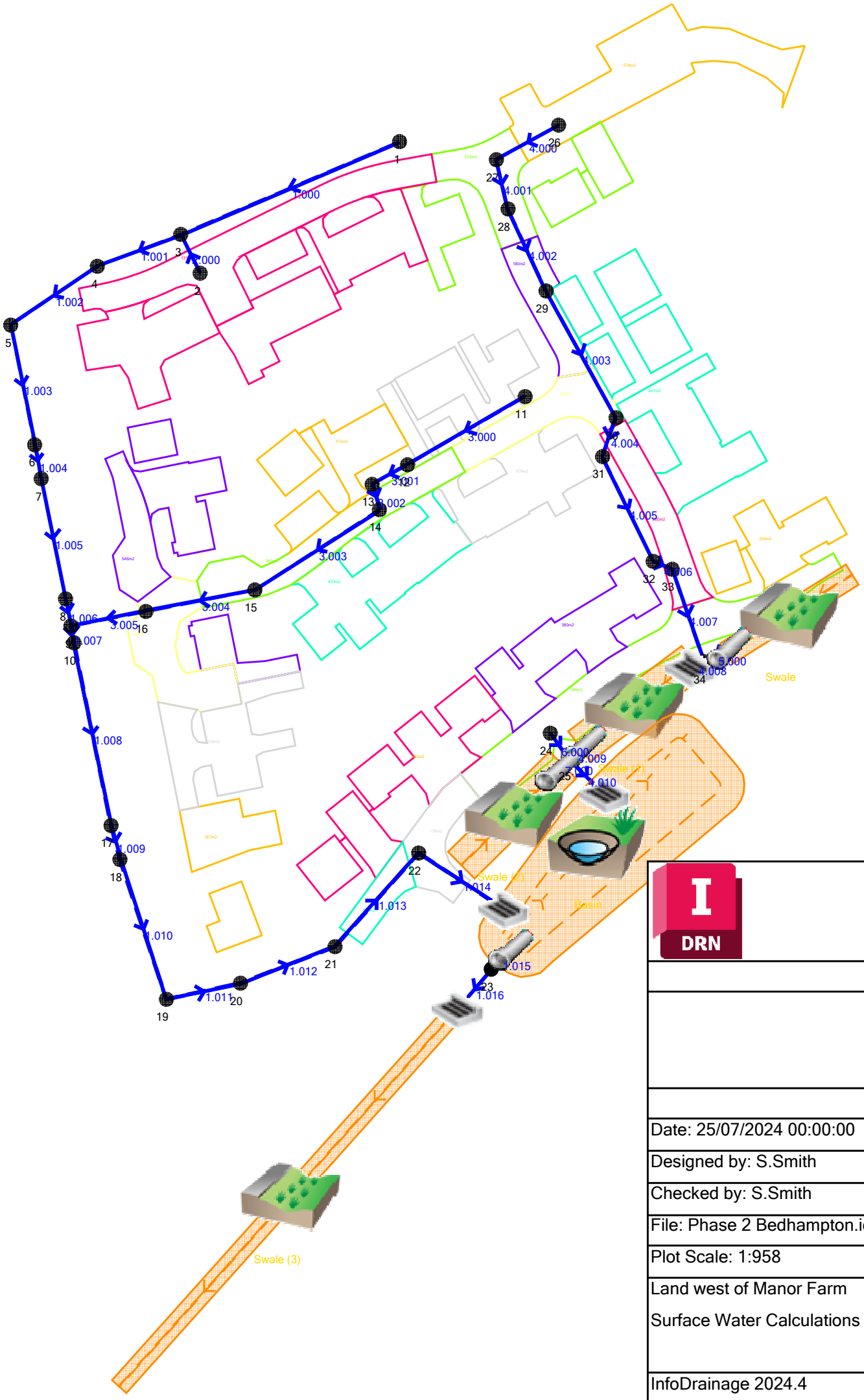
Appendix D – Surface Water Network Calculations



Date: 25/07/2024 00:00:00

Designed by: S.Smith

Checked by: S.Smith

File: Phase 2 Bedhampton.iddx

Plot Scale: 1:958

Land west of Manor Farm

Surface Water Calculations

InfoDrainage 2024.4

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Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by:	Checked by:	Approved By:
	S.Smith	S.Smith	C.Pendle
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: MJA Consulting		

Basin

Type : Pond

Dimensions

Exceedance Level (m)	5.250
Depth (m)	1.460
Base Level (m)	3.790
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.16
Total Volume (m³)	954.778

Depth (m)	Area (m²)	Volume (m³)
0.000	570.00	0.000
0.100	609.00	58.939
0.200	650.00	121.878
0.300	685.00	188.620
0.400	724.00	259.061
0.500	764.00	333.453
0.600	845.00	413.869
0.700	887.00	500.460
0.800	929.00	591.252
0.900	973.00	686.343
1.000	1016.00	785.786
1.100	1060.00	889.578
1.200	1150.00	1000.047
1.300	1196.00	1117.340
1.460	1200.00	1309.020

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	4.010
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	1.014
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (38)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.015
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	61.890
Friction Scheme	Manning's n
n	0.03

Swale

Type : Swale

Swale

Exceedance Level (m)	5.250
Depth (m)	0.750
Base Level (m)	4.500
Top Width (m)	4.660
Side Slope (1:X)	3.00
Base Width (m)	0.160
Freeboard (mm)	300
Length (m)	29.000
Long. Slope (1:X)	300.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m^3)	19.706

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (32)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (33)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	5.000
Outlet Type	Free Discharge

Advanced

Swale

Porosity (%)	100

Swale (1)

Type : Swale

Swale

Exceedance Level (m)	5.250
Depth (m)	1.200
Base Level (m)	4.050
Top Width (m)	7.360
Side Slope (1:X)	3.00
Base Width (m)	0.160
Freeboard (mm)	300
Length (m)	27.727
Long. Slope (1:X)	300.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m^3)	71.370

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	4.008
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	4.009
Outlet Type	Free Discharge

Advanced

Swale

Porosity (%)	100

Swale (2)

Type : Swale

Swale

Exceedance Level (m)	5.250
Depth (m)	1.200
Base Level (m)	4.050
Top Width (m)	7.360
Side Slope (1:X)	3.00
Base Width (m)	0.160
Freeboard (mm)	300
Length (m)	27.847
Long. Slope (1:X)	300.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m^3)	71.679

Inlets

Outlets

Outlet

Outgoing Connection	7.000
Outlet Type	Free Discharge

Advanced

Swale

Porosity (%)	100

Swale (3)

Type : Swale

Swale

Exceedance Level (m)	3.950
Depth (m)	0.600
Base Level (m)	3.350
Top Width (m)	3.760
Side Slope (1:X)	3.00
Base Width (m)	0.160
Freeboard (mm)	300
Length (m)	100.112
Long. Slope (1:X)	300.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m^3)	31.836

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.016
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Weir
Width (m)	1.000
Coefficient of Discharge	0.544
Crest Level (m)	3.750

Advanced

Swale

Porosity (%)	100

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Connections Storm Phase: Phase	Company Address: MJA Consulting		

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
1.000	46.436	Pipe	232.181		0.6	225	7.000	6.000
2.000	8.466	Pipe	56.439		0.6	225	7.150	5.950
1.001	17.462	Pipe	291.034		0.6	225	7.000	5.800
1.002	20.458	Pipe	204.578		0.6	225	7.500	5.740
1.003	23.852	Pipe	54.209		0.6	225	7.350	5.640
1.004	6.736	Pipe	56.135		0.6	225	6.800	5.200
1.005	23.967	Pipe	54.471		0.6	225	6.800	5.080
1.006	5.401	Pipe	38.577		0.6	225	6.400	4.640
3.000	26.559	Pipe	221.325		0.6	225	6.350	5.000
3.001	7.906	Pipe	197.645		0.6	225	6.100	4.880
3.002	5.155	Pipe	257.772		0.6	225	6.050	4.840
3.003	28.958	Pipe	160.876		0.6	300	5.950	4.820
3.004	21.695	Pipe	197.230		0.6	300	6.150	4.680
3.005	14.953	Pipe	213.611		0.6	300	6.300	4.570
1.007	3.338	Pipe	66.762		0.6	450	6.300	4.350
1.008	36.432	Pipe	280.247		0.6	450	5.600	4.300
1.009	6.857	Pipe	342.860		0.6	450	5.600	4.170
1.010	28.777	Pipe	287.768		0.6	450	5.500	4.150
1.011	14.815	Pipe	296.296		0.6	450	5.100	4.050
1.012	19.808	Pipe	282.967		0.6	450	5.050	4.000
1.013	24.532	Pipe	306.645		0.6	450	5.000	3.930
4.000	13.912	Pipe	139.118		0.6	225	6.900	5.520
4.001	9.887	Pipe	98.872		0.6	225	6.800	5.420
4.002	17.658	Pipe	98.099		0.6	225	6.700	5.320
4.003	28.317	Pipe	97.644		0.6	225	6.550	5.140
4.004	8.032	Pipe	100.403		0.6	225	6.400	4.850
4.005	22.705	Pipe	103.202		0.6	225	6.500	4.770
4.006	4.039	Pipe	100.975		0.6	300	6.450	4.550
4.007	19.064	Pipe	40.562		0.6	300	6.250	4.510
6.000	6.131	Pipe	-47.160		0.6	300	6.150	4.040
5.000	5.616	Pipe	16.045		0.6	300	5.400	4.500
4.008	2.912	Pipe	145.595		0.6	300	5.350	4.150
4.009	3.866	Pipe	128.864		0.6	300	5.350	4.050
7.000	3.274	Pipe	109.128		0.6	300	5.350	4.050
4.010	9.862	Pipe	328.734		0.6	300	5.350	4.020
1.015	5.355	Pipe	0.000		0.6	450	5.250	3.790
1.016	10.279	Pipe	73.424		0.6	225	5.250	3.790
1.014	19.925	Pipe	332.088		0.6	450	5.250	3.850

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Connections Storm Phase: Phase	Company Address: MJA Consulting		

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)
1.000	7.000	5.800	All	
2.000	7.000	5.800	All	
1.001	7.500	5.740	All	
1.002	7.350	5.640	All	
1.003	6.800	5.200	All	
1.004	6.800	5.080	All	
1.005	6.400	4.640	All	
1.006	6.300	4.500	All	
3.000	6.100	4.880	All	
3.001	6.050	4.840	All	
3.002	5.950	4.820	All	
3.003	6.150	4.640	All	
3.004	6.300	4.570	All	
3.005	6.300	4.500	All	
1.007	5.600	4.300	All	
1.008	5.600	4.170	All	
1.009	5.500	4.150	All	
1.010	5.100	4.050	All	
1.011	5.050	4.000	All	
1.012	5.000	3.930	All	
1.013	5.250	3.850	All	
4.000	6.800	5.420	All	
4.001	6.700	5.320	All	
4.002	6.550	5.140	All	
4.003	6.400	4.850	All	
4.004	6.500	4.770	All	
4.005	6.450	4.550	All	
4.006	6.250	4.510	All	
4.007	5.350	4.040	All	
6.000	5.350	4.170	All	
5.000	5.350	4.150	All	
4.008	5.350	4.130	All	
4.009	5.350	4.020	All	
7.000	5.350	4.020	All	
4.010	3.250	3.990	All	
1.015	5.250	3.790	All	
1.016	5.250	3.650	All	3.6
1.014	5.250	3.790	All	

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by:	Checked by:	Approved By:
	S.Smith	S.Smith	C.Pendle
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: MJA Consulting		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	1		Time of Concentration	0.013	100	10	110	0.014
Catchment Area (1)	29		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (2)	30		Time of Concentration	0.012	100	10	110	0.013
Catchment Area (3)	30		Time of Concentration	0.034	100	10	110	0.037
Catchment Area (4)	33		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (5)	11		Time of Concentration	0.031	100	10	110	0.035
Catchment Area (6)	12		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (7)	11		Time of Concentration	0.033	100	10	110	0.037
Catchment Area (8)	24		Time of Concentration	0.061	100	0	100	0.061
Catchment Area (9)	3		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (10)	14		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	7		Time of Concentration	0.006	100	10	110	0.007
Catchment Area (12)	16		Time of Concentration	0.020	100	10	110	0.022
Catchment Area (13)	8		Time of Concentration	0.017	100	0	100	0.017
Catchment Area (14)	24		Time of Concentration	0.038	100	10	110	0.042
Catchment Area (15)	14		Time of Concentration	0.043	100	10	110	0.048
Catchment Area (16)	30		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (17)	14		Time of Concentration	0.035	100	0	100	0.035
Catchment Area (18)	15		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (19)	16		Time of Concentration	0.029	100	0	100	0.029
Catchment Area (20)	20		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (21)	18		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (22)	17		Time of Concentration	0.034	100	10	110	0.037
Catchment Area (23)	22		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (24)	22		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (25)	26		Time Area Diagram	0.058	100	0	100	0.058
Catchment Area (26)	26		Time of Concentration	0.019	100	10	110	0.020
Catchment Area (27)	27		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (28)	3		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (29)	1		Time of Concentration	0.022	100	10	110	0.024

Catchment Area (30)	2		Time of Concentration	0.086	100	10	110	0.095
Catchment Area (31)	29		Time of Concentration	0.021	100	10	110	0.023
Catchment Area (32)	Swale		Time of Concentration	0.020	100	10	110	0.022
Catchment Area (33)	Swale		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (34)	24		Time of Concentration	0.031	100	10	110	0.034
Catchment Area (35)	22		Time of Concentration	0.010	100	10	110	0.011
Catchment Area (36)	22		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (37)	13		Time of Concentration	0.025	100	10	110	0.027
Catchment Area (38)	Basin		Time of Concentration	0.122	100	0	100	0.122
TOTAL		**0.0**		**1.026**				**1.076**

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Swale (3)	Free Discharge		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Use Catchment Values
Junction Flood Risk Margin (mm)	300
Prefill Manhole Sumps	☐
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 470300 105900 SU 70300 05900
Rainfall Version	1999
C (1km)	-0.029
D1 (1km)	0.459
D2 (1km)	0.300
D3 (1km)	0.375
E (1km)	0.310
F (1km)	2.225
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	0.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by:	Checked by:	Approved By:
	S.Smith	S.Smith	C.Pendle
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Phase	MJA Consulting		

FEH: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
1	FEH: 1 years: +0 %: 15 mins: Summer	7.000	6.000	6.048	0.048	3.9	0.054	0.000	3.5	1.680	OK
2	FEH: 1 years: +0 %: 15 mins: Summer	7.150	5.950	6.006	0.056	9.6	0.063	0.000	9.5	4.172	OK
3	FEH: 1 years: +0 %: 15 mins: Summer	7.000	5.800	5.914	0.114	16.0	0.129	0.000	14.1	7.165	OK
4	FEH: 1 years: +0 %: 15 mins: Summer	7.500	5.740	5.837	0.097	14.1	0.110	0.000	13.1	7.143	OK
5	FEH: 1 years: +0 %: 15 mins: Summer	7.350	5.640	5.705	0.065	13.1	0.074	0.000	12.3	7.126	OK
6	FEH: 1 years: +0 %: 15 mins: Summer	6.800	5.200	5.268	0.068	12.3	0.077	0.000	11.7	7.108	OK
7	FEH: 1 years: +0 %: 15 mins: Summer	6.800	5.080	5.144	0.064	12.3	0.072	0.000	11.7	7.384	OK
8	FEH: 1 years: +0 %: 30 mins: Summer	6.400	4.640	4.706	0.066	13.1	0.075	0.000	13.1	11.314	OK
9	FEH: 1 years: +0 %: 15 mins: Summer	6.300	4.350	4.465	0.115	32.5	0.130	0.000	31.9	19.004	OK
10	FEH: 1 years: +0 %: 30 mins: Summer	5.600	4.300	4.424	0.124	30.7	0.140	0.000	30.7	26.412	OK
11	FEH: 1 years: +0 %: 15 mins: Summer	6.350	5.000	5.070	0.070	7.2	0.079	0.000	6.8	3.135	OK
12	FEH: 1 years: +0 %: 15 mins: Summer	6.100	4.880	4.951	0.071	7.1	0.080	0.000	6.5	3.253	OK
13	FEH: 1 years: +0 %: 15 mins: Summer	6.050	4.840	4.932	0.092	9.2	0.104	0.000	8.8	4.447	OK
14	FEH: 1 years: +0 %: 15 mins: Summer	5.950	4.820	4.909	0.089	17.8	0.101	0.000	17.0	8.362	OK
15	FEH: 1 years: +0 %: 15 mins: Summer	6.150	4.640	4.778	0.138	18.1	0.156	0.000	16.6	8.688	OK
16	FEH: 1 years: +0 %: 15 mins: Summer	6.300	4.570	4.682	0.112	21.7	0.127	0.000	19.8	10.887	OK
17	FEH: 1 years: +0 %: 30 mins: Summer	5.600	4.170	4.318	0.148	33.3	0.168	0.000	33.3	28.627	OK
18	FEH: 1 years: +0 %: 30 mins: Summer	5.500	4.150	4.287	0.137	34.5	0.154	0.000	34.4	29.687	OK
19	FEH: 1 years: +0 %: 30 mins: Summer	5.100	4.050	4.193	0.143	34.4	0.161	0.000	34.3	29.647	OK
20	FEH: 1 years: +0 %: 15 mins: Summer	5.050	4.000	4.141	0.141	33.9	0.159	0.000	35.8	21.434	OK
21	FEH: 1 years: +0 %: 1440 mins: Summer	5.000	3.930	4.106	0.176	7.3	0.199	0.000	7.2	161.299	OK
22	FEH: 1 years: +0 %: 1440 mins: Summer	5.250	3.850	4.106	0.256	7.9	0.452	0.000	7.7	176.715	OK
23	FEH: 1 years: +0 %: 1440 mins: Summer	5.250	3.790	4.106	0.316	3.3	0.558	0.000	3.3	322.752	Surcharged
24	FEH: 1 years: +0 %: 15 mins: Summer	6.150	4.040	4.261	0.221	13.9	0.250	0.000	13.4	5.864	OK
25	FEH: 1 years: +0 %: 30 mins: Summer	5.350	4.020	4.165	0.145	27.4	0.164	0.000	26.6	24.629	OK
26	FEH: 1 years: +0 %: 15 mins: Summer	6.900	5.520	5.582	0.062	6.9	0.070	0.000	6.7	3.447	OK
27	FEH: 1 years: +0 %: 15 mins: Summer	6.800	5.420	5.486	0.066	9.0	0.074	0.000	8.6	4.451	OK

28	FEH: 1 years: +0 %: 15 mins: Summer	6.700	5.320	5.382	0.062	8.6	0.070	0.000	8.2	4.440	OK
29	FEH: 1 years: +0 %: 15 mins: Summer	6.550	5.140	5.212	0.072	12.4	0.082	0.000	11.6	6.226	OK
30	FEH: 1 years: +0 %: 15 mins: Summer	6.400	4.850	4.952	0.102	19.0	0.115	0.000	18.1	9.426	OK
31	FEH: 1 years: +0 %: 15 mins: Summer	6.500	4.770	4.865	0.095	18.1	0.108	0.000	17.3	9.409	OK
32	FEH: 1 years: +0 %: 15 mins: Summer	6.450	4.550	4.635	0.085	17.3	0.096	0.000	16.6	9.386	OK
33	FEH: 1 years: +0 %: 15 mins: Summer	6.250	4.510	4.573	0.063	18.8	0.071	0.000	18.4	10.358	OK
34	FEH: 1 years: +0 %: 15 mins: Summer	5.350	4.040	4.278	0.238	20.4	0.269	0.000	19.0	11.168	OK

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
1	FEH: 30 years: +0 %: 15 mins: Summer	7.000	6.000	6.111	0.111	12.7	0.126	0.000	7.3	5.537	OK
2	FEH: 30 years: +0 %: 15 mins: Summer	7.150	5.950	6.143	0.193	31.5	0.219	0.000	29.5	13.650	OK
3	FEH: 30 years: +0 %: 15 mins: Summer	7.000	5.800	6.107	0.307	47.0	0.347	0.000	43.8	23.509	Surcharged
4	FEH: 30 years: +0 %: 15 mins: Summer	7.500	5.740	5.946	0.206	43.8	0.233	0.000	41.8	23.489	OK
5	FEH: 30 years: +0 %: 15 mins: Summer	7.350	5.640	5.770	0.130	41.8	0.147	0.000	40.6	23.468	OK
6	FEH: 30 years: +0 %: 15 mins: Summer	6.800	5.200	5.344	0.144	40.6	0.163	0.000	39.6	23.445	OK
7	FEH: 30 years: +0 %: 15 mins: Summer	6.800	5.080	5.211	0.131	41.8	0.148	0.000	41.0	24.380	OK
8	FEH: 30 years: +0 %: 15 mins: Summer	6.400	4.640	4.782	0.142	46.8	0.161	0.000	45.4	26.860	OK
9	FEH: 30 years: +0 %: 15 mins: Summer	6.300	4.350	4.612	0.262	113.6	0.296	0.000	112.4	62.920	OK
10	FEH: 30 years: +0 %: 15 mins: Summer	5.600	4.300	4.568	0.268	112.4	0.303	0.000	105.7	62.855	OK
11	FEH: 30 years: +0 %: 15 mins: Summer	6.350	5.000	5.139	0.139	23.6	0.157	0.000	22.6	10.249	OK
12	FEH: 30 years: +0 %: 15 mins: Summer	6.100	4.880	5.062	0.182	23.5	0.206	0.000	21.0	10.657	OK
13	FEH: 30 years: +0 %: 15 mins: Summer	6.050	4.840	5.044	0.204	30.1	0.231	0.000	29.0	14.570	OK
14	FEH: 30 years: +0 %: 15 mins: Summer	5.950	4.820	5.011	0.191	58.5	0.216	0.000	56.1	27.359	OK
15	FEH: 30 years: +0 %: 15 mins: Summer	6.150	4.640	4.897	0.257	59.9	0.291	0.000	55.7	28.826	OK
16	FEH: 30 years: +0 %: 15 mins: Summer	6.300	4.570	4.814	0.244	72.5	0.276	0.000	68.1	36.079	OK
17	FEH: 30 years: +0 %: 15 mins: Summer	5.600	4.170	4.473	0.303	118.0	0.342	0.000	109.6	68.080	OK
18	FEH: 30 years: +0 %: 960 mins: Winter	5.500	4.150	4.462	0.312	13.4	0.352	0.000	13.3	303.832	OK
19	FEH: 30 years: +0 %: 960 mins: Winter	5.100	4.050	4.462	0.412	13.3	0.465	0.000	13.0	301.872	OK
20	FEH: 30 years: +0 %: 960 mins: Winter	5.050	4.000	4.462	0.462	13.3	0.522	0.000	13.0	305.345	Surcharged
21	FEH: 30 years: +0 %: 960 mins: Winter	5.000	3.930	4.462	0.532	13.0	0.601	0.000	12.7	302.062	Surcharged
22	FEH: 30 years: +0 %: 960 mins: Winter	5.250	3.850	4.462	0.612	14.0	1.081	0.000	13.7	327.624	Surcharged
23	FEH: 30 years: +0 %: 960 mins: Winter	5.250	3.790	4.461	0.671	3.4	1.187	0.000	3.3	319.668	Surcharged
24	FEH: 30 years: +0 %: 960 mins: Winter	6.150	4.040	4.462	0.422	3.7	0.477	0.000	3.7	84.564	Surcharged
25	FEH: 30 years: +0 %: 960 mins: Winter	5.350	4.020	4.462	0.442	10.4	0.499	0.000	9.7	252.581	Surcharged
26	FEH: 30 years: +0 %: 15 mins: Summer	6.900	5.520	5.646	0.126	22.6	0.142	0.000	22.0	11.296	OK
27	FEH: 30 years: +0 %: 15 mins: Summer	6.800	5.420	5.555	0.135	29.6	0.152	0.000	28.6	14.585	OK

28	FEH: 30 years: +0 %: 15 mins: Summer	6.700	5.320	5.448	0.128	28.6	0.145	0.000	27.5	14.564	OK
29	FEH: 30 years: +0 %: 15 mins: Summer	6.550	5.140	5.293	0.153	41.1	0.173	0.000	35.6	20.431	OK
30	FEH: 30 years: +0 %: 15 mins: Summer	6.400	4.850	5.170	0.320	59.9	0.362	0.000	57.6	30.927	Surcharged
31	FEH: 30 years: +0 %: 15 mins: Summer	6.500	4.770	5.028	0.258	57.6	0.291	0.000	54.9	30.910	Surcharged
32	FEH: 30 years: +0 %: 15 mins: Summer	6.450	4.550	4.713	0.163	54.9	0.184	0.000	53.5	30.880	OK
33	FEH: 30 years: +0 %: 15 mins: Summer	6.250	4.510	4.629	0.119	60.8	0.135	0.000	60.0	34.048	OK
34	FEH: 30 years: +0 %: 960 mins: Winter	5.350	4.040	4.462	0.422	7.2	0.477	0.000	7.2	163.132	Surcharged

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by:	Checked by:	Approved By:
	S.Smith	S.Smith	C.Pendle
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: Phase	MJA Consulting		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
1	FEH: 100 years: +45 %: 15 mins: Summer	7.000	6.000	7.005	1.005	28.3	5.727	4.596	11.7	12.418	Flood
2	FEH: 100 years: +45 %: 15 mins: Summer	7.150	5.950	7.150	1.200	69.9	1.597	0.240	59.2	30.336	Flood
3	FEH: 100 years: +45 %: 15 mins: Summer	7.000	5.800	7.000	1.200	90.5	1.749	0.392	74.6	52.382	Flood
4	FEH: 100 years: +45 %: 30 mins: Summer	7.500	5.740	6.657	0.917	67.8	1.037	0.000	67.2	65.559	Surcharged
5	FEH: 100 years: +45 %: 15 mins: Summer	7.350	5.640	6.320	0.680	72.0	0.770	0.000	67.3	52.315	Surcharged
6	FEH: 100 years: +45 %: 15 mins: Summer	6.800	5.200	5.886	0.686	67.3	0.776	0.000	68.0	52.339	Surcharged
7	FEH: 100 years: +45 %: 15 mins: Summer	6.800	5.080	5.704	0.624	69.1	0.706	0.000	71.4	54.496	Surcharged
8	FEH: 100 years: +45 %: 30 mins: Summer	6.400	4.640	5.212	0.572	74.9	0.647	0.000	74.1	75.189	Surcharged
9	FEH: 100 years: +45 %: 15 mins: Summer	6.300	4.350	5.037	0.687	198.5	0.777	0.000	192.6	140.543	Surcharged
10	FEH: 100 years: +45 %: 15 mins: Summer	5.600	4.300	4.989	0.689	192.6	0.779	0.000	185.8	140.486	Surcharged
11	FEH: 100 years: +45 %: 15 mins: Summer	6.350	5.000	6.171	1.171	52.5	1.324	0.000	42.2	22.823	Flood Risk
12	FEH: 100 years: +45 %: 15 mins: Summer	6.100	4.880	5.979	1.099	44.4	1.243	0.000	35.0	23.787	Flood Risk
13	FEH: 100 years: +45 %: 15 mins: Summer	6.050	4.840	5.927	1.087	55.1	1.229	0.000	48.2	32.538	Flood Risk
14	FEH: 100 years: +45 %: 15 mins: Summer	5.950	4.820	5.858	1.038	111.2	1.174	0.000	102.0	60.932	Flood Risk
15	FEH: 100 years: +45 %: 15 mins: Summer	6.150	4.640	5.569	0.929	110.5	1.050	0.000	102.2	64.475	Surcharged
16	FEH: 100 years: +45 %: 15 mins: Summer	6.300	4.570	5.335	0.765	139.5	0.865	0.000	132.3	80.277	Surcharged
17	FEH: 100 years: +45 %: 1440 mins: Winter	5.600	4.170	4.941	0.771	17.3	0.873	0.000	17.0	593.170	Surcharged
18	FEH: 100 years: +45 %: 1440 mins: Winter	5.500	4.150	4.941	0.791	17.6	0.895	0.000	17.4	611.786	Surcharged
19	FEH: 100 years: +45 %: 1440 mins: Winter	5.100	4.050	4.941	0.891	17.4	1.008	0.000	17.3	607.262	Flood Risk
20	FEH: 100 years: +45 %: 1440 mins: Winter	5.050	4.000	4.941	0.941	17.7	1.065	0.000	17.6	614.976	Flood Risk
21	FEH: 100 years: +45 %: 1440 mins: Winter	5.000	3.930	4.941	1.011	17.6	1.144	0.000	17.5	610.260	Flood Risk
22	FEH: 100 years: +45 %: 1440 mins: Winter	5.250	3.850	4.941	1.091	19.3	1.928	0.000	19.3	665.956	Surcharged
23	FEH: 100 years: +45 %: 1440 mins: Winter	5.250	3.790	4.941	1.151	3.4	2.034	0.000	3.3	492.213	Surcharged
24	FEH: 100 years: +45 %: 1440 mins: Winter	6.150	4.040	4.941	0.901	5.1	1.019	0.000	5.0	173.305	Surcharged
25	FEH: 100 years: +45 %: 1440 mins: Winter	5.350	4.020	4.941	0.921	12.4	1.042	0.000	10.0	483.347	Surcharged
26	FEH: 100 years: +45 %: 15 mins: Summer	6.900	5.520	6.735	1.215	50.0	1.374	0.000	38.7	25.131	Flood Risk
27	FEH: 100 years: +45 %: 15 mins: Summer	6.800	5.420	6.734	1.314	55.6	1.486	0.000	44.8	32.480	Flood Risk

28	FEH: 100 years: +45 %: 15 mins: Summer	6.700	5.320	6.700	1.380	44.8	1.648	0.088	45.5	32.494	Flood
29	FEH: 100 years: +45 %: 15 mins: Summer	6.550	5.140	6.551	1.411	64.6	2.093	0.498	73.5	45.612	Flood
30	FEH: 100 years: +45 %: 15 mins: Summer	6.400	4.850	6.094	1.244	108.5	1.407	0.000	100.4	68.940	Surcharged
31	FEH: 100 years: +45 %: 15 mins: Summer	6.500	4.770	5.671	0.901	100.4	1.019	0.000	94.4	68.920	Surcharged
32	FEH: 100 years: +45 %: 1440 mins: Winter	6.450	4.550	4.941	0.391	8.0	0.443	0.000	8.0	271.793	Surcharged
33	FEH: 100 years: +45 %: 1440 mins: Winter	6.250	4.510	4.941	0.431	8.8	0.488	0.000	8.8	298.882	Surcharged
34	FEH: 100 years: +45 %: 1440 mins: Winter	5.350	4.040	4.941	0.901	9.8	1.019	0.000	9.8	329.091	Surcharged

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)
Swale	FEH: 1 years: +0 %: 15 mins: Summer	4.643	4.517	4.540	0.047	0.017	0.040	2.8	0.344	0.000	0.000	2.0	1.220	4
Swale (1)	FEH: 1 years: +0 %: 30 mins: Summer	4.258	4.175	4.168	0.116	0.125	0.118	18.2	1.683	0.000	0.000	17.8	15.655	2
Swale (2)	FEH: 1 years: +0 %: 30 mins: Summer	4.165	4.165	4.118	0.022	0.115	0.068	2.1	0.792	0.000	0.000	2.0	0.809	
Swale (3)	FEH: 1 years: +0 %: 1440 mins: Summer	3.767	3.765	3.599	0.083	0.415	0.249	3.3	26.770	0.000	0.000	3.3	297.957	138
Basin	FEH: 1 years: +0 %: 1440 mins: Summer	4.106	4.106	4.106	0.316	0.316	0.316	15.3	199.376	0.000	0.000	3.3	322.874	551

Percentage Available (%)	Status
98.253	OK
97.642	OK
98.895	OK
15.913	Flood Risk
79.118	OK

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)
Swale	FEH: 30 years: +0 %: 15 mins: Summer	4.679	4.532	4.571	0.082	0.032	0.071	9.3	0.813	0.000	0.000	7.7	4.022	2
Swale (1)	FEH: 30 years: +0 %: 960 mins: Winter	4.462	4.462	4.415	0.320	0.412	0.365	7.2	12.818	0.000	0.000	6.7	159.599	19
Swale (2)	FEH: 30 years: +0 %: 960 mins: Winter	4.461	4.462	4.415	0.319	0.412	0.365	0.9	12.859	0.000	0.000	0.4	9.329	
Swale (3)	FEH: 30 years: +0 %: 1440 mins: Summer	3.767	3.766	3.599	0.084	0.416	0.249	3.3	26.786	0.000	0.000	3.3	455.519	135
Basin	FEH: 30 years: +0 %: 960 mins: Winter	4.462	4.462	4.462	0.672	0.672	0.672	26.6	475.354	0.000	0.000	3.4	320.959	1193

Percentage Available (%)	Status
95.874	OK
82.039	OK
82.060	OK
15.861	Flood Risk
50.213	OK

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)
Swale	FEH: 100 years: +45 %: 1440 mins: Winter	4.941	4.941	4.893	0.344	0.441	0.393	1.0	15.377	0.000	0.000	1.0	32.430	287
Swale (1)	FEH: 100 years: +45 %: 1440 mins: Winter	4.942	4.941	4.895	0.799	0.891	0.845	9.8	63.250	0.000	0.000	7.3	289.267	86
Swale (2)	FEH: 100 years: +45 %: 1440 mins: Winter	4.941	4.941	4.895	0.798	0.891	0.845	2.7	63.488	0.000	0.000	0.6	25.216	
Swale (3)	FEH: 100 years: +45 %: 2160 mins: Winter	3.767	3.766	3.599	0.084	0.416	0.249	3.3	26.786	0.000	0.000	3.3	701.274	140
Basin	FEH: 100 years: +45 %: 1440 mins: Winter	4.941	4.941	4.941	1.151	1.151	1.151	33.5	945.034	0.000	0.000	3.4	494.415	2457

Percentage Available (%)	Status
21.968	OK
11.378	OK
11.427	OK
15.861	Flood Risk
1.021	OK

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	1	3	7.000	6.048	0.081	1.680	0.3	0.1	3.5	OK
2.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	2	3	7.150	6.006	0.085	4.172	0.7	0.14	9.5	OK
1.001	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	3	4	7.000	5.914	0.106	7.165	0.8	0.46	14.1	OK
1.002	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	4	5	7.500	5.837	0.081	7.143	1.0	0.36	13.1	OK
1.003	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	5	6	7.350	5.705	0.067	7.126	1.2	0.17	12.3	OK
1.004	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	6	7	6.800	5.268	0.066	7.108	1.2	0.17	11.7	OK
1.005	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	7	8	6.800	5.144	0.065	10.265	1.2	0.17	11.9	OK
1.006	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	8	9	6.400	4.706	0.063	11.314	1.4	0.16	13.1	OK
3.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	11	12	6.350	5.070	0.070	3.135	0.6	0.2	6.8	OK
3.001	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	12	13	6.100	4.951	0.081	3.253	0.5	0.18	6.5	OK
3.002	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	13	14	6.050	4.932	0.090	4.447	0.6	0.27	8.8	OK
3.003	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	14	15	5.950	4.909	0.114	8.362	0.7	0.19	17.0	OK
3.004	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	15	16	6.150	4.778	0.105	8.688	0.7	0.21	16.6	OK
3.005	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	16	9	6.300	4.682	0.108	10.887	0.9	0.26	19.8	OK
1.007	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	9	10	6.300	4.465	0.119	19.004	0.9	0.08	31.9	OK
1.008	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	10	17	5.600	4.424	0.136	26.412	0.8	0.16	30.7	OK
1.009	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	17	18	5.600	4.318	0.142	28.627	0.8	0.19	33.3	OK

1.010	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	18	19	5.500	4.287	0.140	29.687	0.8	0.18	34.4	OK
1.011	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	19	20	5.100	4.193	0.141	29.647	0.8	0.18	34.3	OK
1.012	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	20	21	5.050	4.141	0.143	21.434	0.8	0.19	35.8	OK
1.013	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	21	22	5.000	4.075	0.141	21.294	0.9	0.21	37.8	OK
4.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	26	27	6.900	5.582	0.064	3.447	0.7	0.15	6.7	OK
4.001	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	27	28	6.800	5.486	0.064	4.451	0.9	0.16	8.6	OK
4.002	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	28	29	6.700	5.382	0.067	4.440	0.8	0.16	8.2	OK
4.003	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	29	30	6.550	5.212	0.087	6.226	0.8	0.22	11.6	OK
4.004	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	30	31	6.400	4.952	0.099	9.426	1.1	0.35	18.1	OK
4.005	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	31	32	6.500	4.865	0.090	9.409	1.2	0.34	17.3	OK
4.006	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	32	33	6.450	4.635	0.074	9.386	1.2	0.15	16.6	OK
4.007	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	33	34	6.250	4.573	0.150	10.358	0.5	0.1	18.4	OK
6.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	24	25	6.150	4.261	0.140	0.000	0.4	0.25	13.4	OK
5.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	Swale	34	5.400	4.540	0.072	1.220	0.2	0.01	2.0	OK
4.008	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	34	Swale (1)	5.350	4.278	0.121	11.168	0.7	0.21	19.0	OK
4.009	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	Swale (1)	25	5.350	4.168	0.135	15.641	0.6	0.18	17.8	OK
7.000	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	Swale (2)	25	5.350	4.116	0.126	0.002	0.1	0.03	3.0	OK
4.010	FEH: 1 years: +0 %: 30 mins: Summer	Pipe	25	Basin	5.350	4.165	0.134	23.670	0.9	0.44	26.6	OK
1.015	FEH: 1 years: +0 %: 1440 mins: Summer	Pipe	Basin	23	5.250	4.106	0.316	322.835	0.1	0.03	3.3	OK
1.016	FEH: 1 years: +0 %: 1440 mins: Summer	Pipe	23	Swale (3)	5.250	4.106	0.060	322.738	0.5	0.05	3.3	Surcharged
1.014	FEH: 1 years: +0 %: 15 mins: Summer	Pipe	22	Basin	5.250	3.988	0.104	23.306	1.5	0.23	40.6	OK

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FEH: 30 years: +0 %: 30 mins: Summer	Pipe	1	3	7.000	6.074	0.147	7.106	0.3	0.24	8.2	OK
2.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	2	3	7.150	6.143	0.225	13.650	0.7	0.43	29.5	OK
1.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	3	4	7.000	6.107	0.225	23.509	1.1	1.45	43.8	Surcharged
1.002	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	4	5	7.500	5.946	0.168	23.489	1.3	1.15	41.8	OK
1.003	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	5	6	7.350	5.770	0.137	23.468	1.6	0.57	40.6	OK
1.004	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	6	7	6.800	5.344	0.138	23.445	1.6	0.57	39.6	OK
1.005	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	7	8	6.800	5.211	0.137	24.380	1.6	0.58	41.0	OK
1.006	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	8	9	6.400	4.782	0.130	26.860	1.9	0.54	45.4	OK
3.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	11	12	6.350	5.139	0.160	10.249	0.7	0.65	22.6	OK
3.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	12	13	6.100	5.062	0.193	10.657	0.6	0.57	21.0	OK
3.002	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	13	14	6.050	5.044	0.197	14.570	0.8	0.9	29.0	OK
3.003	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	14	15	5.950	5.011	0.224	27.359	1.0	0.64	56.1	OK
3.004	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	15	16	6.150	4.897	0.230	28.826	1.0	0.71	55.7	OK
3.005	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	16	9	6.300	4.814	0.224	36.079	1.2	0.9	68.1	OK
1.007	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	9	10	6.300	4.612	0.265	62.920	1.2	0.28	112.4	OK
1.008	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	10	17	5.600	4.568	0.286	62.855	1.0	0.55	105.7	OK
1.009	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	17	18	5.600	4.473	0.289	68.080	1.0	0.63	109.6	OK

1.010	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	18	19	5.500	4.426	0.274	70.565	1.1	0.57	108.6	OK
1.011	FEH: 30 years: +0 %: 30 mins: Summer	Pipe	19	20	5.100	4.335	0.280	91.078	1.0	0.56	104.9	OK
1.012	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	20	21	5.050	4.280	0.278	71.644	1.1	0.57	108.9	OK
1.013	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	21	22	5.000	4.206	0.261	70.946	1.2	0.63	114.9	OK
4.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	26	27	6.900	5.646	0.130	11.296	0.9	0.5	22.0	OK
4.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	27	28	6.800	5.555	0.132	14.585	1.2	0.55	28.6	OK
4.002	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	28	29	6.700	5.448	0.141	14.564	1.1	0.52	27.5	OK
4.003	FEH: 30 years: +0 %: 15 mins: Winter	Pipe	29	30	6.550	5.281	0.217	20.427	0.9	0.71	37.2	OK
4.004	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	30	31	6.400	5.170	0.225	30.927	1.4	1.11	57.6	Surcharged
4.005	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	31	32	6.500	5.028	0.210	30.910	1.4	1.07	54.9	Surcharged
4.006	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	32	33	6.450	4.713	0.141	30.880	1.6	0.48	53.5	OK
4.007	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	33	34	6.250	4.629	0.237	34.048	1.0	0.34	60.0	OK
6.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	24	25	6.150	4.358	0.213	0.000	0.8	0.85	45.0	Surcharged
5.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	Swale	34	5.400	4.571	0.138	4.022	0.2	0.03	7.7	OK
4.008	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	34	Swale (1)	5.350	4.395	0.223	37.639	1.2	0.72	66.2	OK
4.009	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	Swale (1)	25	5.350	4.302	0.294	37.523	0.8	0.6	58.2	OK
7.000	FEH: 30 years: +0 %: 30 mins: Summer	Pipe	Swale (2)	25	5.350	4.252	0.264	0.000	0.2	0.11	11.3	OK
4.010	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	25	Basin	5.350	4.316	0.258	56.921	1.2	1.32	80.5	OK
1.015	FEH: 30 years: +0 %: 2880 mins: Winter	Pipe	Basin	23	5.250	4.396	0.450	811.476	0.1	0.04	4.3	Surcharged
1.016	FEH: 30 years: +0 %: 480 mins: Winter	Pipe	23	Swale (3)	5.250	4.409	0.060	158.765	0.6	0.05	3.3	Surcharged
1.014	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	22	Basin	5.250	4.097	0.208	76.318	2.0	0.68	120.7	OK

Project:	Date:		
Land west of Manor Farm Surface Water Calculations	25/07/2024		
	Designed by: S.Smith	Checked by: S.Smith	Approved By: C.Pendle
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address: MJA Consulting		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
1.000	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	1	3	7.000	7.004	0.225	12.416	0.7	0.86	29.3	Flood
2.000	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	2	3	7.150	7.150	0.225	30.336	1.5	0.85	59.2	Flood
1.001	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	3	4	7.000	7.000	0.225	52.369	1.9	2.52	76.3	Flood
1.002	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	4	5	7.500	6.583	0.225	52.336	1.8	2.02	73.2	Surcharged
1.003	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	5	6	7.350	6.241	0.225	52.299	1.7	0.95	67.3	Surcharged
1.004	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	6	7	6.800	5.886	0.225	52.339	1.7	0.98	68.0	Surcharged
1.005	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	7	8	6.800	5.662	0.225	54.477	1.8	1.01	71.6	Surcharged
1.006	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	8	9	6.400	5.147	0.225	60.019	2.0	0.93	78.2	Surcharged
3.000	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	11	12	6.350	6.171	0.225	22.823	1.1	1.21	42.2	Flood Risk
3.001	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	12	13	6.100	5.979	0.225	23.787	0.9	0.95	35.0	Flood Risk
3.002	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	13	14	6.050	5.927	0.225	32.538	1.2	1.5	48.2	Flood Risk
3.003	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	14	15	5.950	5.858	0.300	60.932	1.4	1.17	102.0	Flood Risk
3.004	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	15	16	6.150	5.569	0.300	64.475	1.4	1.3	102.2	Surcharged
3.005	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	16	9	6.300	5.335	0.300	80.277	1.9	1.75	132.3	Surcharged
1.007	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	9	10	6.300	5.037	0.450	140.543	1.2	0.49	192.6	Surcharged
1.008	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	10	17	5.600	4.989	0.450	140.486	1.2	0.97	185.8	Surcharged
1.009	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	17	18	5.600	4.830	0.450	151.745	1.3	1.19	207.0	Surcharged

1.010	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	18	19	5.500	4.760	0.450	156.713	1.3	1.13	213.8	Surcharged
1.011	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	19	20	5.100	4.613	0.450	154.877	1.3	1.11	206.8	Surcharged
1.012	FEH: 100 years: +45 %: 30 mins: Summer	Pipe	20	21	5.050	4.516	0.450	192.693	1.3	1.09	209.4	Surcharged
1.013	FEH: 100 years: +45 %: 30 mins: Summer	Pipe	21	22	5.000	4.392	0.450	188.696	1.3	1.13	208.1	Surcharged
4.000	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	26	27	6.900	6.735	0.225	25.131	1.0	0.88	38.7	Flood Risk
4.001	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	27	28	6.800	6.734	0.225	32.480	1.1	0.86	44.8	Flood Risk
4.002	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	28	29	6.700	6.555	0.225	32.531	1.2	0.92	48.5	Flood Risk
4.003	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	29	30	6.550	6.551	0.225	45.612	1.8	1.4	73.5	Flood
4.004	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	30	31	6.400	6.094	0.225	68.940	2.5	1.93	100.4	Surcharged
4.005	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	31	32	6.500	5.671	0.225	68.920	2.4	1.85	94.4	Surcharged
4.006	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	32	33	6.450	4.891	0.300	68.893	1.5	0.83	91.8	Surcharged
4.007	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	33	34	6.250	4.827	0.300	75.876	1.4	0.58	101.9	Surcharged
6.000	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	24	25	6.150	4.540	0.300	0.000	1.4	1.88	99.9	Surcharged
5.000	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	Swale	34	5.400	4.611	0.300	8.962	0.3	0.05	14.9	OK
4.008	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	34	Swale (1)	5.350	4.655	0.300	84.010	1.6	1.25	114.8	Surcharged
4.009	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	Swale (1)	25	5.350	4.532	0.300	80.827	1.4	1.02	100.2	Surcharged
7.000	FEH: 100 years: +45 %: 15 mins: Winter	Pipe	Swale (2)	25	5.350	4.447	0.300	0.000	0.4	0.24	25.8	Surcharged
4.010	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	25	Basin	5.350	4.496	0.300	119.758	1.9	2.15	131.1	Surcharged
1.015	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	Basin	23	5.250	4.269	0.450	5.136	0.4	0.09	10.2	Surcharged
1.016	FEH: 100 years: +45 %: 480 mins: Winter	Pipe	23	Swale (3)	5.250	4.841	0.059	158.522	0.6	0.05	3.3	Surcharged
1.014	FEH: 100 years: +45 %: 30 mins: Summer	Pipe	22	Basin	5.250	4.361	0.450	203.574	2.1	1.27	224.6	Surcharged