

Arborfield Garrison SDL

Reserved Matters Application
Drainage Statement
Arborfield Green District Centre

Crest Nicholson Chiltern

60312043/DC/DS

March 2023

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
1.0	03/04/23	For Planning	CLP	C. Parkinson	R. Director

Report:

Drainage Statement
District Centre

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1. Introduction

- 1.1 AECOM has been appointed by Crest Nicholson to prepare a Foul and Surface Water Drainage Statement for the District Centre Parcel of the proposed development at Arborfield Garrison SDL. This statement has been prepared in support of the Reserved Matters Application, described as:

Application for approval of Reserved Matters pursuant to O/2014/2280 for the provision of a new District Centre including 200 dwellings, commercial floorspace (Use Class E), a community centre (including the provision of a nursery, café and associated community facilities), a pre-school, open space, new vehicular, pedestrian and cycle accesses with associated internal roads, parking, landscaping, drainage, substations, plant, bin and cycle storage. Access, appearance, landscaping, layout and scale to be considered.

- 1.2 AECOM have previously prepared a Foul and Surface Water Drainage Strategy for the whole Arborfield Garrison SDL site in September 2014 to assess the potential for draining the proposed development. The site wide drainage strategy was developed in accordance with the Environment Agency and Wokingham Borough Council's requirements, and approved as part of the outline planning permission (Ref. O/2014/2280).
- 1.3 This Statement and supporting drawings and calculations provide the necessary details to discharge Reserved Matters Conditions 43, 44, 45 and 46, which relate to Foul and Surface Water.
- 1.4 All Hydraulic calculations have been prepared in general accordance with Design and Construction guidance for foul and surface water sewers, May 2021.
- 1.5 Technical submission will be submitted following this Reserved Matters Application. All adoptable drainage works will be in accordance with Design and Construction guidance and to the satisfaction of Thames Water Engineers. All attenuation features and associated pipework will be subject to approval from Wokingham Borough Council. Written approvals from both Authorities need to be confirmed prior to the commencement of any works.
- 1.6 The drainage design covered by this Drainage Statement is shown in the drawing presented as **Appendix A.1**.
- 1.7 Further details are as follows:
- District Centre Catchment Plan - **Appendix A.2**
 - District Centre Sewers to be abandoned – **Appendix A.3**
- 1.8 Network hydraulic calculations are contained in:
- Appendix B:** District Centre SW Network Simulation Results
- Appendix C:** District Centre Parcel R SW Network Simulation Results
- Appendix D:** District Centre FW Network Simulation Results

2. Surface Water Run-off Management

The Arborfield Green District Centre Drainage Strategy demonstrates that the proposals are in general accordance with the site wide Surface Water Drainage Strategy recommendations. The site wide report recommended the following design philosophy:

- Surface water sewers are designed to convey a design storm of a 1 in 30-year return period +30% allowance for climate change, with underground and/or above ground storage provided to cater for more extreme events.
- Surface Water Treatment using the 'Management Train' approach to remove and isolate contamination at source and site control facilities prior to conveyance from the site.
- Integrate SuDS with landscape, habitat and amenity.
- Restrict development runoff peak flow rates to equivalent greenfield run-off rates.
- Site control treatment using attenuation of storm runoff and providing conditions for settlement of suspended solids (detention).
- Use 'soft engineering' techniques to limit the visual impact of the facilities.
- Use of swales and open channels in lieu of pipelines wherever acceptable and practical.
- Aim to limit, where possible, the impermeable fraction of development.
- Provide overland flood routes for extreme events where possible.
- Create and maintain buffer strips of shrubs, herbs and grasses next to SuDS features such as ponds.

2.1 Existing Site

A topographical survey of the District Centre site was carried out by Warner Surveys, dated September 2022. The general topography of the District Centre site is described below:

- The parcel occupies an area of 10.6 hectares.
- The parcel is bound to the north by an existing watercourse and the route of proposed access paths through the Linear Park area, to the south and east by Bohunt Secondary School and a leisure centre, to the south by apartments, and to the west by the Nine Mile Ride Extension and Sheerlands Road public highways.
- The site was formerly part of the Rowcroft Garrison. The buildings were demolished approximately 10 years ago, and since then the site has been undeveloped and used as a construction compound and for stockpiling of materials from the wider Arborfield Garrison site.
- There is a temporary construction site route across the northern part of the site for accessing the stockpiles. There is a temporary access road across the southern part of the site, where a supermarket is proposed. The temporary access road links the Community Centre to the Nine Mile Ride Extension and is to be removed as part of this development and will be replaced by a permanent access road as part of the wider District Centre highways network.
- Discounting stockpiles, the site topography generally falls from south to north, and from west to east. In the south of the parcel, the ground level is approximately 56.7mAOD, with levels on the northern parcel boundary approximately 55.0m AOD. In the west of the parcel, ground level was approximately 56.0m, falling to approximately 51.8m in the most eastern area of the parcel.
- Flood modelling has indicated that areas of land immediately to the east and west of the site are susceptible to flooding from the adjacent watercourse in the 1:100-year storm plus a 30% allowance for climate change.

Based on the findings of a ground investigation undertaken by Wilson Bailey, the ground conditions across the application site are likely to comprise Made Ground of variable depth, overlying firm London Clay deposits. London Clay is a cohesive material with very low permeability and is unlikely to be suitable for the use of soakaway pits. Infiltration methods can be discounted as a drainage option for this site.

2.2 Proposed Surface Water Management Strategy

As per the site wide drainage strategy, the surface water flows will be restricted by flow control devices. Any excess flows from extreme storm events will be stored in attenuation basins prior to release at a controlled rate. Rain gardens are proposed alongside the central market road, and this will provide at source attenuation and water quality treatment.

The existing surface water and foul water sewers located in the proposed District Centre will be diverted to align better with the final Site Layout, provided by Pegasus.

The sewers which are to be abandoned during diversion works are shown on AECOM drawing 60321043-CIV-DC-008.

The proposed surface water drainage network and Sustainable Drainage Systems (SuDS) strategy for the District Centre Parcel is shown on AECOM drawing 60321043-CIV-DC-007.

Catchments

The surface water runoff is separated into catchments presented on AECOM drawing 60321043-CIV-DC-006.

Plot C1, Plot Q, the Community Centre Site and the existing highway Nine Mile Ride Extension currently drain into the existing surface water network. The hydraulic design of the new sewers makes allowances for this.

The surface water runoff from these catchments, as well as the surface water runoff from the Western Residential Parcel, the Central Zone, the Eastern Residential Parcel, the Supermarket Site and the Pub Site, is directed north towards the District Centre Pond.

The District Centre Pond is designed at two levels. A lower pond will attenuate up to the 1 in 20 year +30% Climate Change storm events. The pond will fill and overtop into the higher pond, which will attenuate the 1 in 100 year +Climate Change storm event. The upper pond will take a limited catchment from the proposed pub site to top up the water levels. Both ponds will be permanently wet.

The runoff from this pond is controlled using a hydro-brake downstream of the pond, prior to the outfall into the watercourse.

The surface water runoff from Parcel R is directed north-east to the Parcel R basin. This basin is not intended to contain permanent water. The runoff from this catchment is controlled using a hydro-brake downstream of the pond, before it outfalls into the watercourse.

The Supermarket site will have a restricted flow rate into the proposed sewer network. The drainage design for the supermarket will be the subject of a separate planning application.

The proposed pub site will have a restricted flow rate into the proposed sewer network. The drainage design for the pub will be the subject of a separate planning application.

The preliminary Windes design calculations are appended to this document. All piped drainage will be designed to Section 104 adoptable standards and in accordance with relevant guidelines.

The hydraulic calculations show that no flooding occurs along most of the piped network in return periods up to and including the Sewers for Adoption requirements of 1 in 30 years +30% allowance for climate change as a minimum requirement.

The model simulations indicate limited flooding within the existing network, due to increased impermeable areas in the constructed layout. However, this is upstream of the proposed diversion so will not be affected by the proposed development. The current limited flooding scenarios are improved by the new surface water drainage network.

2.3 Maintenance and Management of SuDS

The surface water from the District Centre will be directed to either the eastern attenuation basin, or the District Centre Pond.

Rain gardens are proposed in parts of the site. It is anticipated that these will be maintained by the private estate.

Where Wokingham Borough Council (WBC) are adopting the SuDS features, the maintenance requirements and responsibilities will be agreed with WBC. Adopted SUDS features are to be maintained by the Local Authority. Any SuDS features that are not to be adopted by WBC will be maintained by the private estate.

To restrict flows from the Supermarket and Pub sites to the agreed discharge rates, some on-parcel surface water attenuation may be required; the design and maintenance of this will be the subject of separate planning applications.

Typical maintenance tasks associated with SuDS drainage are indicated in Figure 1, below:

Operation and maintenance activity	SuDS component										
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip
Regular maintenance											
Inspection	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■
Weed and invasive plant control	□	□	□	□	□	□	□	□	□	□	■
Shrub management (including pruning)	□	□	□	□					□	□	□
Shoreline vegetation management	■	■	□								
Aquatic vegetation management	■	■	□								
Occasional maintenance											
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■
Vegetation replacement	□	□	□	□					□	□	■
Vacuum sweeping and brushing								■			
Remedial maintenance											
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□
Infiltration surface reconditioning				□	□	□	□	□	□	□	
Key ■ will be required □ may be required Notes 1 Sediment should be collected and managed in pre-treatment systems, upstream of the main device.											

Figure 1: Typical SuDS components operation and maintenance activities (The SuDS Manual, 2015)

Management of SuDS will be undertaken in an ecologically sensitive manner to promote increased biodiversity of the site. The series of ditches, swales and ponds being introduced across the wider Arborfield Garrison site will provide a number of wetland habitats, as well as retaining stormwater and releasing it slowly back into the environment.

The following best practice guidance will be taken into account when determining the management of SuDS, in particular those which will be permanently wet, and offer habitat for wildlife and in particular amphibians:

- Marginal vegetation should be monitored to ensure it does not engulf the open water. At least 50% of the water surface area should be maintained as open and free from marginal vegetation.
- Ditches and swales will be monitored annually to ensure that aquatic vegetation does not block the channel and impede water flow and will be removed as necessary. The ditches will be cut annually on a rotational basis, to ensure a year-round supply of vegetative cover and food sources.

- Ponds will be kept free from predatory fish. Occasional drying up can be good as it prevents fish from becoming established. Ponds however, need to retain open water for the majority of the amphibian breeding and larval development seasons to ensure adequate numbers of new recruits into the local population.
- Silt or water plants should not excessively choke ponds. Areas of open water will be retained.
- Management of ponds will be undertaken in late autumn and winter only when amphibians are less likely to be present. Only a small percentage of the pond area will be managed in any one year to leave sections undisturbed as refuges.

2.4 Water Framework Directive (WFD)

The Arborfield Garrison Site lies in the catchment of the Barkham Brook WFD designated water body.

According to the current WFD the Ecological status for the Barkham Brook is poor and for Physico-Chemical Quality status is poor. It is predicted to have an improved Ecological status rising from poor to moderate by 2015.

The Environment Agency website (updated on 14th September 2021) <https://environment.data.gov.uk/catchment-planning/WaterBody/GB106039017400>, records that in the 2019 assessment the Barkham Brook had a Moderate Ecological Status, and Moderate Physio-chemical status.

The proposed SuDS basin and ponds features will attenuate flows and treat diffuse urban pollutants to prevent fine particulates, oils and other chemicals from being discharged to the tributaries of the Barkham Brook.

Overall, it is considered that the proposed attenuation will ensure that surface water runoff does not cause deterioration or prevent the improvement of any WFD parameters monitored for the ditch course located to the south of the development parcel.

3. Foul Water Discharge

The foul water drainage strategy is in accordance with the site wide Foul and Surface Water Drainage Assessment, approved as part of the outline planning permission.

The design principles are as follows:

- All piped drainage will be designed to Section 104 adoptable standards and in accordance with relevant guidelines.
- Conventional pipework with self-cleansing velocities to convey the foul water.
- Connections into an existing public foul sewer.

3.1 Proposed Foul Water Drainage Strategy

The foul drainage from the development parcel will be discharged north-east by gravity into an existing Thames Water sewer. The foul water drainage from the most north-eastern part of the site connects into a different, lower manhole on the existing Thames Water sewer due to the lower proposed site levels presenting a constraint in this area.

The Foul water network simulation reports are included in **Appendix D**.

The site wide foul drainage strategy has been developed where possible with Thames Water in line with their preferred growth scheme incorporating the entire Arborfield Garrison SDL. Thames Water has undertaken a foul water impact study with project reference X4503-669.

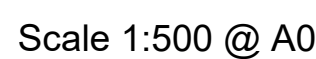
Once future parcels are brought forward for development Thames Water will be contacted to ensure that these future parcels can also be supported without the need to undertake any improvement works either downstream or at the Arborfield Sewerage Treatment Works, due to the increase in the number of units proposed for the network compared with original proposals. All connections will be subject to Thames Water approval under Section 106 of the Water Industry Act 1991.

4. Conclusions

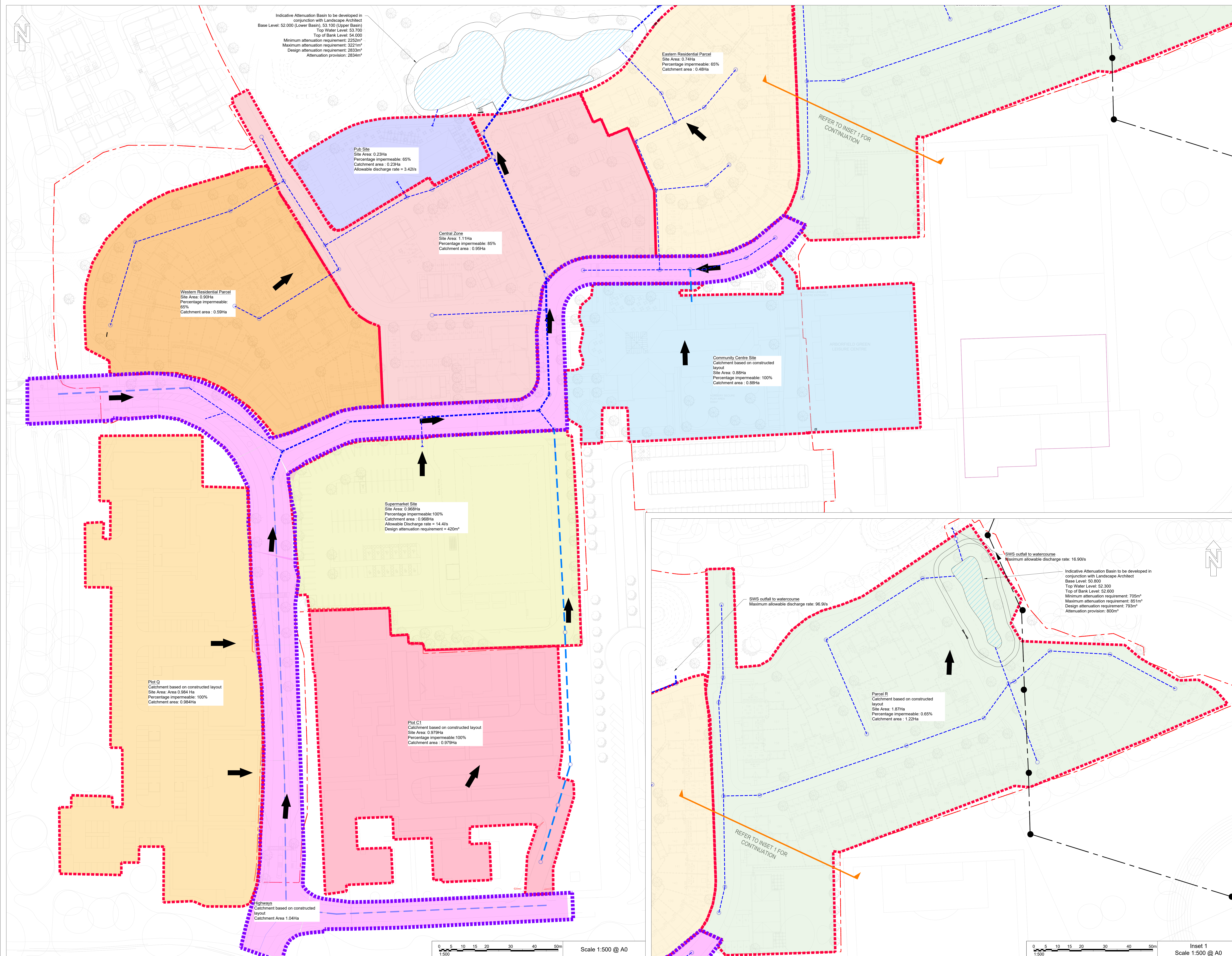
In accordance with the site wide Foul and Surface Water Drainage assessment, the District Centre Foul and Surface Water Drainage Strategy is as follows:

- SuDS basins will provide treatment before attenuated flows outfall into the existing watercourse, to the north of the development parcel.
- Foul and Surface Water drainage will be designed in accordance with Design and Construction guidance for foul and surface water sewers, May 2021.
- Any areas of the site which are not adopted by either WBC or Thames Water would be maintained by a private estate management company.

Appendix A – SW Network Drainage Design Drawings



PROJECT NUMBERSHEET NUMBER0312043/CIV/DC/008



Appendix B – District Centre SW Network Simulation Report

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for PRELIM-NET-03-REVC.SWS

Pipe Sizes PRELIM-NET-03-REVC Manhole Sizes PRELIM-NET-03-REVC

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.200	Add Flow / Climate Change (%)	0
Ratio R	0.400	Minimum Backdrop Height (m)	1.000
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	0.75
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for PRELIM-NET-03-REVC.SWS

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	1.859	4-8	3.244	8-12	0.898	12-16	0.030

Total Area Contributing (ha) = 6.031

Total Pipe Volume (m³) = 190.176

Network Design Table for PRELIM-NET-03-REVC.SWS

- Indicates pipe length does not match coordinates

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	88.331	0.395	223.6	0.101	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	21.267	0.026	818.0	0.026	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	56.467	0.250	225.9	0.316	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	48.970	1.450	33.8	0.176	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	55.089	0.220	250.4	0.292	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	44.54	6.41	54.845	0.101	0.0	0.0	0.0	1.05	74.0	12.2
1.001	42.46	7.06	54.450	0.127	0.0	0.0	0.0	0.54	38.3	14.6
1.002	39.93	7.96	54.424	0.443	0.0	0.0	0.0	1.04	73.7	47.9
2.000	48.38	5.36	55.630	0.176	0.0	0.0	0.0	2.26	89.8	23.1
1.003	37.95	8.77	54.030	0.911	0.0	0.0	0.0	1.14	126.0	93.6

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Network Design Table for PRELIM-NET-03-REVC.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
3.000	49.913	1.020	48.9	0.299	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	39.707	0.160	248.2	0.071	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	29.825	0.155	192.4	0.080	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	11.914	0.050	238.3	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
4.000	44.135	0.640	69.0	0.105	5.00	0.0	0.600	o	225	Pipe/Conduit	
4.001	47.432	0.520	91.2	0.087	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.007	30.131	0.100	301.3	0.046	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.008	30.988	0.115	269.5	0.043	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.000	8.600	0.043	200.0	0.000	5.00	13.4	0.600	o	225	Pipe/Conduit	
1.009	49.584	0.215	230.6	0.076	0.00	0.0	0.600	o	600	Pipe/Conduit	
6.000	6.389	0.025	255.6	0.979	5.00	0.0	0.600	o	600	Pipe/Conduit	
6.001	58.403	0.200	292.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.002	85.365	1.186	72.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
6.003	10.213	0.104	98.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	7.924	0.026	304.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.011	35.615	0.117	304.4	0.934	0.00	0.0	0.600	o	675	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.000	48.05	5.44	54.960	0.299	0.0	0.0	0.0	1.87	74.5	38.9
1.004	36.80	9.28	53.715	1.281	0.0	0.0	0.0	1.29	204.5	127.7
1.005	36.08	9.62	53.555	1.361	0.0	0.0	0.0	1.46	232.5	133.0
1.006	35.80	9.76	53.325	1.361	0.0	0.0	0.0	1.45	313.2	133.0
4.000	47.96	5.47	54.700	0.105	0.0	0.0	0.0	1.58	62.7	13.6
4.001	45.79	6.04	54.060	0.192	0.0	0.0	0.0	1.37	54.5	23.8
1.007	35.08	10.12	53.165	1.599	0.0	0.0	0.0	1.40	395.2	151.9
1.008	34.42	10.47	53.065	1.642	0.0	0.0	0.0	1.48	418.1	153.1
5.000	49.23	5.16	53.368	0.000	13.4	0.0	0.0	0.92	36.6	13.4
1.009	33.50	10.99	52.950	1.718	13.4	0.0	0.0	1.60	452.2	169.3
6.000	49.59	5.07	54.400	0.979	0.0	0.0	0.0	1.52	429.4	131.5
6.001	46.34	5.89	54.375	0.979	0.0	0.0	0.0	1.18	188.4	131.5
6.002	44.27	6.49	54.175	0.979	0.0	0.0	0.0	2.40	381.4	131.5
6.003	44.00	6.57	52.989	0.979	0.0	0.0	0.0	2.05	326.3	131.5
1.010	33.36	11.07	52.660	2.697	13.4	0.0	0.0	1.50	535.3	257.1
1.011	32.72	11.47	52.634	3.631	13.4	0.0	0.0	1.50	535.7	335.2

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Network Design Table for PRELIM-NET-03-REVC.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.012	14.632	0.048	304.8	0.130	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.013	54.345	0.181	300.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
7.000	36.502	0.747	48.9	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.001	41.883	0.209	200.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.002	25.803	0.129	200.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
8.000	20.706	0.392	52.8	0.020	5.00	0.0	0.600	o	225	Pipe/Conduit	
7.003	32.109	0.165	194.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.000	11.554	0.142	81.4	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
9.001	39.471	0.200	197.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
9.002	11.603	0.822	14.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
7.004	39.869	0.193	206.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.005	11.047	0.062	178.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
7.006	29.199	0.150	194.7	1.090	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.014	10.816	0.036	300.4	0.290	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.015	20.300#	0.070	290.0	0.040	0.00	0.0	0.600	o	675	Pipe/Conduit	
10.000	14.826	0.074	200.4	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
10.001	18.336	0.094	195.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.012	32.47	11.63	52.517	3.761	13.4	0.0	0.0	1.50	535.3	344.1
1.013	31.57	12.23	52.469	3.761	13.4	0.0	0.0	1.51	539.4	344.1
7.000	48.53	5.32	54.393	0.000	0.0	0.0	0.0	1.88	74.6	0.0
7.001	45.65	6.08	53.646	0.000	0.0	0.0	0.0	0.92	36.6	0.0
7.002	44.05	6.55	53.437	0.000	0.0	0.0	0.0	0.92	36.5	0.0
8.000	49.08	5.19	53.825	0.020	0.0	0.0	0.0	1.80	71.7	2.7
7.003	42.27	7.12	53.308	0.020	0.0	0.0	0.0	0.93	37.1	2.7
9.000	49.33	5.13	54.307	0.000	0.0	0.0	0.0	1.45	57.7	0.0
9.001	46.52	5.84	54.165	0.000	0.0	0.0	0.0	0.93	36.9	0.0
9.002	46.31	5.90	53.965	0.000	0.0	0.0	0.0	3.50	139.2	0.0
7.004	40.54	7.73	53.068	0.020	0.0	0.0	0.0	1.09	77.1	2.7
7.005	40.18	7.87	52.800	0.020	0.0	0.0	0.0	1.35	149.6	2.7
7.006	39.31	8.20	52.663	1.110	0.0	0.0	0.0	1.45	231.2	118.2
1.014	31.40	12.35	52.288	5.161	13.4	0.0	0.0	1.51	539.2	452.3
1.015	31.09	12.57	52.252	5.201	13.4	0.0	0.0	1.53	548.9	452.3
10.000	48.76	5.27	53.125	0.000	0.0	0.0	0.0	0.92	36.6	0.0
10.001	47.45	5.60	53.051	0.000	0.0	0.0	0.0	0.93	37.1	0.0

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Network Design Table for PRELIM-NET-03-REVC.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
10.002	18.772	0.094	199.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
10.003	33.569	0.155	216.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
11.000	12.747	0.085	150.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit		
11.001	21.345	0.379	56.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
10.004	22.392	0.126	177.7	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
10.005	18.210	0.091	200.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
12.000	20.634	0.102	202.3	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit		
12.001	13.952	0.400	34.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
10.006	13.370	0.071	188.3	0.710	0.00	0.0	0.600	o	375	Pipe/Conduit		
10.007	25.900#	0.130	199.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		
13.000	12.000#	0.090	133.3	0.120	5.00	0.0	0.600	o	225	Pipe/Conduit		
13.001	40.000#	0.200	200.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.016	16.161	0.054	300.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
1.017	45.071	0.150	300.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		
1.018	3.164	0.011	287.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
10.002	46.18	5.94	52.957	0.000	0.0	0.0	0.0	0.92	36.6	0.0
10.003	44.00	6.57	52.863	0.000	0.0	0.0	0.0	0.88	35.2	0.0
11.000	49.04	5.20	53.172	0.000	0.0	0.0	0.0	1.07	42.4	0.0
11.001	48.21	5.40	53.087	0.000	0.0	0.0	0.0	1.75	69.4	0.0
10.004	42.79	6.95	52.708	0.000	0.0	0.0	0.0	0.98	38.9	0.0
10.005	41.81	7.28	52.582	0.000	0.0	0.0	0.0	0.92	36.6	0.0
12.000	48.32	5.38	52.993	0.000	0.0	0.0	0.0	0.92	36.4	0.0
12.001	47.90	5.48	52.891	0.000	0.0	0.0	0.0	2.22	88.4	0.0
10.006	41.33	7.45	52.341	0.710	0.0	0.0	0.0	1.32	145.5	79.5
10.007	40.40	7.79	52.270	0.710	0.0	0.0	0.0	1.28	141.4	79.5
13.000	49.14	5.18	53.575	0.120	0.0	0.0	0.0	1.13	45.0	16.0
13.001	46.30	5.90	53.485	0.120	0.0	0.0	0.0	0.92	36.6	16.0
1.016	30.78	12.80	52.000	6.031	13.4	0.0	0.0	1.17	185.8	516.1
1.017	29.93	13.45	51.946	6.031	13.4	0.0	0.0	1.17	185.8	516.1
1.018	29.88	13.49	51.796	6.031	13.4	0.0	0.0	1.19	189.8	516.1

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Manhole Schedules for PRELIM-NET-03-REVC.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
19	54.433	2.145	Open Manhole	1500	1.014	52.288	675	1.013	52.288	675	
								7.006	52.513	450	
20	54.323	2.071	Open Manhole	1500	1.015	52.252	675	1.014	52.252	675	
MHE1	54.660	1.535	Open Manhole	1200	10.000	53.125	225				
MHE2	54.853	1.802	Open Manhole	1200	10.001	53.051	225	10.000	53.051	225	
MHE3	55.101	2.144	Open Manhole	1200	10.002	52.957	225	10.001	52.957	225	
MHE4	55.213	2.350	Open Manhole	1200	10.003	52.863	225	10.002	52.863	225	
MHE5	54.623	1.451	Open Manhole	1200	11.000	53.172	225				
MHE6	54.761	1.674	Open Manhole	1200	11.001	53.087	225	11.000	53.087	225	
MHE7	54.829	2.121	Open Manhole	1200	10.004	52.708	225	10.003	52.708	225	
								11.001	52.708	225	
MHE8	54.570	1.988	Open Manhole	1200	10.005	52.582	225	10.004	52.582	225	
MHE9	54.427	1.434	Open Manhole	1200	12.000	52.993	225				
MHE10	54.259	1.368	Open Manhole	1200	12.001	52.891	225	12.000	52.891	225	
MHE11	54.371	2.030	Open Manhole	1350	10.006	52.341	375	10.005	52.491	225	
								12.001	52.491	225	
MHE12	54.326	2.056	Open Manhole	1350	10.007	52.270	375	10.006	52.270	375	
45	54.400	0.825	Open Manhole	1200	13.000	53.575	225				
46	54.400	0.915	Open Manhole	1200	13.001	53.485	225	13.000	53.485	225	
21	54.000	2.000	Open Manhole	1500	1.016	52.000	450	1.015	52.182	675	407
								10.007	52.140	375	65
								13.001	53.285	225	1060
46	53.902	1.956	Open Manhole	1350	1.017	51.946	450	1.016	51.946	450	
22	53.200	1.404	Open Manhole	1350	1.018	51.796	450	1.017	51.796	450	
	53.200	1.415	Open Manhole	0		OUTFALL		1.018	51.785	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
300	476945.104	164871.791	476945.104	164871.791	Required	
301	476856.849	164868.132	476856.849	164868.132	Required	
302	476835.700	164870.374	476835.700	164870.374	Required	
303	476786.012	164927.036	476786.012	164927.036	Required	

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Manhole Schedules for PRELIM-NET-03-REVC.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
304	476834.982	164926.837	476834.982	164926.837	Required	
305	476783.001	164982.113	476783.001	164982.113	Required	
306	476832.913	164981.887	476832.913	164981.887	Required	
307	476831.556	165021.570	476831.556	165021.570	Required	
308	476830.031	165051.356	476830.031	165051.356	Required	
309	476750.839	165087.165	476750.839	165087.165	Required	
310	476794.924	165089.251	476794.924	165089.251	Required	
311	476834.124	165062.546	476834.124	165062.546	Required	
312	476861.552	165075.017	476861.552	165075.017	Required	
313	476892.480	165076.958	476892.480	165076.958	Required	
15	476947.915	164927.849	476947.915	164927.849	Required	
15	476954.300	164928.094	476954.300	164928.094	Required	
314a	476952.897	164986.480	476952.897	164986.480	Required	
314	476948.311	165071.722	476948.311	165071.722	Required	
315a	476941.986	165079.740	476941.986	165079.740	Required	
315	476946.297	165086.388	476946.297	165086.388	Required	
316	476945.042	165121.980	476945.042	165121.980	Required	

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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
18	476944.865	165136.611	476944.865	165136.611	Required	
W1	476761.908	165115.541	476761.908	165115.541	Required	
W2	476772.395	165150.504	476772.395	165150.504	Required	
W3	476812.197	165163.543	476812.197	165163.543	Required	
70a	476825.387	165194.610	476825.387	165194.610	Required	
W4	476834.723	165176.128	476834.723	165176.128	Required	
W5	476814.092	165123.610	476814.092	165123.610	Required	
W6	476824.346	165118.285	476824.346	165118.285	Required	
W7	476857.898	165139.075	476857.898	165139.075	Required	
W8	476852.086	165149.118	476852.086	165149.118	Required	
W9	476886.468	165169.301	476886.468	165169.301	Required	
W10	476897.032	165172.531	476897.032	165172.531	Required	
19	476922.795	165186.273	476922.795	165186.273	Required	
20	476918.299	165196.110	476918.299	165196.110	Required	
MHE1	477041.276	165152.335	477041.276	165152.335	Required	
MHE2	477029.086	165143.896	477029.086	165143.896	Required	
MHE3	477011.442	165138.907	477011.442	165138.907	Required	

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Manhole Schedules for PRELIM-NET-03-REVC.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MHE4	476992.670	165138.834	476992.670	165138.834	Required	
MHE5	477021.904	165182.961	477021.904	165182.961	Required	
MHE6	477012.389	165174.478	477012.389	165174.478	Required	
MHE7	476991.148	165172.368	476991.148	165172.368	Required	
MHE8	476982.519	165193.031	476982.519	165193.031	Required	
MHE9	477024.628	165222.957	477024.628	165222.957	Required	
MHE10	477011.447	165207.081	477011.447	165207.081	Required	
MHE11	476998.984	165200.811	476998.984	165200.811	Required	
MHE12	476993.380	165212.950	476993.380	165212.950	Required	
45	476881.105	165187.358	476881.105	165187.358	Required	
46	476894.448	165190.956	476894.448	165190.956	Required	
21	476980.437	165238.607	476980.437	165238.607	Required	
46	476992.280	165249.604	476992.280	165249.604	Required	
22	477034.443	165265.532	477034.443	165265.532	Required	
	477034.912	165268.661			No Entry	

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	300	300	56.862	54.845	1.717	Open Manhole	1200
1.001	o	300	301	58.017	54.450	3.267	Open Manhole	1200
1.002	o	300	302	58.387	54.424	3.663	Open Manhole	1200
2.000	o	225	303	58.449	55.630	2.594	Open Manhole	1200
1.003	o	375	304	57.869	54.030	3.464	Open Manhole	1350
3.000	o	225	305	57.723	54.960	2.538	Open Manhole	1200
1.004	o	450	306	57.260	53.715	3.095	Open Manhole	1350
1.005	o	450	307	56.824	53.555	2.819	Open Manhole	1350
1.006	o	525	308	56.598	53.325	2.748	Open Manhole	1500
4.000	o	225	309	56.328	54.700	1.403	Open Manhole	1200
4.001	o	225	310	56.161	54.060	1.876	Open Manhole	1200
1.007	o	600	311	56.553	53.165	2.788	Open Manhole	1500
1.008	o	600	312	56.722	53.065	3.057	Open Manhole	1500
5.000	o	225	Supermarket	55.600	53.368	2.007	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	88.331	223.6	301	58.017	54.450	3.267	Open Manhole	1200
1.001	21.267	818.0	302	58.387	54.424	3.663	Open Manhole	1200
1.002	56.467	225.9	304	57.869	54.174	3.395	Open Manhole	1350
2.000	48.970	33.8	304	57.869	54.180	3.464	Open Manhole	1350
1.003	55.089	250.4	306	57.260	53.810	3.075	Open Manhole	1350
3.000	49.913	48.9	306	57.260	53.940	3.095	Open Manhole	1350
1.004	39.707	248.2	307	56.824	53.555	2.819	Open Manhole	1350
1.005	29.825	192.4	308	56.598	53.400	2.748	Open Manhole	1500
1.006	11.914	238.3	311	56.553	53.275	2.753	Open Manhole	1500
4.000	44.135	69.0	310	56.161	54.060	1.876	Open Manhole	1200
4.001	47.432	91.2	311	56.553	53.540	2.788	Open Manhole	1500
1.007	30.131	301.3	312	56.722	53.065	3.057	Open Manhole	1500
1.008	30.988	269.5	313	56.415	52.950	2.865	Open Manhole	1500
5.000	8.600	200.0	313	56.415	53.325	2.865	Open Manhole	1500

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	o	600	313	56.415	52.950	2.865	Open Manhole	1500
6.000	o	600	15	56.200	54.400	1.200	Open Manhole	1500
6.001	o	450	15	56.200	54.375	1.375	Open Manhole	1500
6.002	o	450	314a	56.200	54.175	1.575	Open Manhole	1350
6.003	o	450	314	56.200	52.989	2.761	Open Manhole	1500
1.010	o	675	315a	55.675	52.660	2.340	Open Manhole	1500
1.011	o	675	315	55.587	52.634	2.278	Open Manhole	2100
1.012	o	675	316	55.063	52.517	1.871	Open Manhole	2100
1.013	o	675	18	54.961	52.469	1.817	Open Manhole	1500
7.000	o	225	W1	55.818	54.393	1.200	Open Manhole	1200
7.001	o	225	W2	55.071	53.646	1.200	Open Manhole	1200
7.002	o	225	W3	55.801	53.437	2.139	Open Manhole	1200
8.000	o	225	70a	55.250	53.825	1.200	Open Manhole	1200
7.003	o	225	W4	55.204	53.308	1.671	Open Manhole	1200
9.000	o	225	W5	55.822	54.307	1.290	Open Manhole	1200
9.001	o	225	W6	55.848	54.165	1.458	Open Manhole	1200
9.002	o	225	W7	55.635	53.965	1.445	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.009	49.584	230.6	315a	55.675	52.735	2.340	Open Manhole	1500
6.000	6.389	255.6	15	56.200	54.375	1.225	Open Manhole	1500
6.001	58.403	292.0	314a	56.200	54.175	1.575	Open Manhole	1350
6.002	85.365	72.0	314	56.200	52.989	2.761	Open Manhole	1500
6.003	10.213	98.2	315a	55.675	52.885	2.340	Open Manhole	1500
1.010	7.924	304.8	315	55.587	52.634	2.278	Open Manhole	2100
1.011	35.615	304.4	316	55.063	52.517	1.871	Open Manhole	2100
1.012	14.632	304.8	18	54.961	52.469	1.817	Open Manhole	1500
1.013	54.345	300.2	19	54.433	52.288	1.470	Open Manhole	1500
7.000	36.502	48.9	W2	55.071	53.646	1.200	Open Manhole	1200
7.001	41.883	200.4	W3	55.801	53.437	2.139	Open Manhole	1200
7.002	25.803	200.8	W4	55.204	53.308	1.671	Open Manhole	1200
8.000	20.706	52.8	W4	55.204	53.433	1.546	Open Manhole	1200
7.003	32.109	194.6	W8	55.531	53.143	2.163	Open Manhole	1200
9.000	11.554	81.4	W6	55.848	54.165	1.458	Open Manhole	1200
9.001	39.471	197.4	W7	55.635	53.965	1.445	Open Manhole	1200
9.002	11.603	14.1	W8	55.531	53.143	2.163	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.004	o	300	W8	55.531	53.068	2.163	Open Manhole	1200
7.005	o	375	W9	54.798	52.800	1.623	Open Manhole	1350
7.006	o	450	W10	54.660	52.663	1.547	Open Manhole	1350
1.014	o	675	19	54.433	52.288	1.470	Open Manhole	1500
1.015	o	675	20	54.323	52.252	1.396	Open Manhole	1500
10.000	o	225	MHE1	54.660	53.125	1.310	Open Manhole	1200
10.001	o	225	MHE2	54.853	53.051	1.577	Open Manhole	1200
10.002	o	225	MHE3	55.101	52.957	1.919	Open Manhole	1200
10.003	o	225	MHE4	55.213	52.863	2.125	Open Manhole	1200
11.000	o	225	MHE5	54.623	53.172	1.226	Open Manhole	1200
11.001	o	225	MHE6	54.761	53.087	1.449	Open Manhole	1200
10.004	o	225	MHE7	54.829	52.708	1.896	Open Manhole	1200
10.005	o	225	MHE8	54.570	52.582	1.763	Open Manhole	1200
12.000	o	225	MHE9	54.427	52.993	1.209	Open Manhole	1200
12.001	o	225	MHE10	54.259	52.891	1.143	Open Manhole	1200
10.006	o	375	MHE11	54.371	52.341	1.655	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
7.004	39.869	206.6	W9	54.798	52.875	1.623	Open Manhole	1350
7.005	11.047	178.2	W10	54.660	52.738	1.547	Open Manhole	1350
7.006	29.199	194.7	19	54.433	52.513	1.470	Open Manhole	1500
1.014	10.816	300.4	20	54.323	52.252	1.396	Open Manhole	1500
1.015	20.300#	290.0	21	54.000	52.182	1.143	Open Manhole	1500
10.000	14.826	200.4	MHE2	54.853	53.051	1.577	Open Manhole	1200
10.001	18.336	195.1	MHE3	55.101	52.957	1.919	Open Manhole	1200
10.002	18.772	199.7	MHE4	55.213	52.863	2.125	Open Manhole	1200
10.003	33.569	216.6	MHE7	54.829	52.708	1.896	Open Manhole	1200
11.000	12.747	150.0	MHE6	54.761	53.087	1.449	Open Manhole	1200
11.001	21.345	56.3	MHE7	54.829	52.708	1.896	Open Manhole	1200
10.004	22.392	177.7	MHE8	54.570	52.582	1.763	Open Manhole	1200
10.005	18.210	200.1	MHE11	54.371	52.491	1.655	Open Manhole	1350
12.000	20.634	202.3	MHE10	54.259	52.891	1.143	Open Manhole	1200
12.001	13.952	34.9	MHE11	54.371	52.491	1.655	Open Manhole	1350
10.006	13.370	188.3	MHE12	54.326	52.270	1.681	Open Manhole	1350

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.007	o	375	MHE12	54.326	52.270	1.681	Open Manhole	1350
13.000	o	225	45	54.400	53.575	0.600	Open Manhole	1200
13.001	o	225	46	54.400	53.485	0.690	Open Manhole	1200
1.016	o	450	21	54.000	52.000	1.550	Open Manhole	1500
1.017	o	450	46	53.902	51.946	1.506	Open Manhole	1350
1.018	o	450	22	53.200	51.796	0.954	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
10.007	25.900#	199.2	21	54.000	52.140	1.485	Open Manhole	1500
13.000	12.000#	133.3	46	54.400	53.485	0.690	Open Manhole	1200
13.001	40.000#	200.0	21	54.000	53.285	0.490	Open Manhole	1500
1.016	16.161	300.0	46	53.902	51.946	1.506	Open Manhole	1350
1.017	45.071	300.0	22	53.200	51.796	0.954	Open Manhole	1350
1.018	3.164	287.6		53.200	51.785	0.965	Open Manhole	0

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Free Flowing Outfall Details for PRELIM-NET-03-REVC.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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1.018		53.200	51.785	0.000	0	0
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Simulation Criteria for PRELIM-NET-03-REVC.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	2	Number of Storage Structures	2	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.200	Storm Duration (mins)	30
Ratio R	0.400		

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Online Controls for PRELIM-NET-03-REVC.SWS

Hydro-Brake® Optimum Manhole: 15, DS/PN: 6.001, Volume (m³): 4.6

Unit Reference	MD-SHE-0389-1050-2125-1050
Design Head (m)	2.125
Design Flow (l/s)	105.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	389
Invert Level (m)	54.375
Minimum Outlet Pipe Diameter (mm)	450
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.125	105.0	Kick-Flo®	1.491	88.4
Flush-Flo™	0.700	104.8	Mean Flow over Head Range	-	89.0

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)	Depth (m)	Flow (l/s)
0.100	10.8	0.800	104.5	2.000	102.0	4.000	142.9	7.000	187.8
0.200	38.5	1.000	102.8	2.200	106.8	4.500	151.3	7.500	194.3
0.300	73.9	1.200	99.8	2.400	111.4	5.000	159.3	8.000	200.5
0.400	99.5	1.400	93.6	2.600	115.8	5.500	166.9	8.500	206.5
0.500	102.8	1.600	91.5	3.000	124.2	6.000	174.2	9.000	212.4
0.600	104.4	1.800	96.9	3.500	133.9	6.500	181.1	9.500	218.1

Hydro-Brake® Optimum Manhole: 21, DS/PN: 1.016, Volume (m³): 14.5

Unit Reference	MD-CHE-0357-9660-1700-9660
Design Head (m)	1.700
Design Flow (l/s)	96.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	No
Diameter (mm)	357
Invert Level (m)	52.000
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.700	96.6	Kick-Flo®	0.798	67.7
Flush-Flo™	0.607	96.6	Mean Flow over Head Range	-	71.1

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

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Storage Structures for PRELIM-NET-03-REVC.SWS

Cellular Storage Manhole: 15, DS/PN: 6.001

Invert Level (m) 54.075 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	180.0	0.0	0.800	180.0	0.0

Tank or Pond Manhole: 21, DS/PN: 1.016

Invert Level (m) 52.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1324.0	1.700	1941.0	1.710	0.0	2.000	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.200 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 30, 30

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	300	15 Winter	2	+0%	30/15 Summer	30/15 Winter			54.943
1.001	301	15 Winter	2	+0%	30/15 Summer	100/15 Winter			54.672
1.002	302	15 Winter	2	+0%	30/15 Summer				54.635
2.000	303	15 Winter	2	+0%	30/15 Summer	100/15 Winter			55.720
1.003	304	15 Winter	2	+0%	30/15 Summer				54.346
3.000	305	15 Winter	2	+0%	30/15 Summer	100/15 Summer			55.098
1.004	306	15 Winter	2	+0%	30/15 Summer				54.053
1.005	307	15 Winter	2	+0%	30/15 Summer				53.881
1.006	308	15 Winter	2	+0%	30/15 Summer				53.683
4.000	309	15 Winter	2	+0%	30/15 Summer	100/15 Winter			54.782
4.001	310	15 Winter	2	+0%	30/15 Summer	100/15 Winter			54.181
1.007	311	15 Winter	2	+0%	30/15 Summer				53.509
1.008	312	15 Winter	2	+0%	30/15 Summer				53.398
5.000	Supermarket	15 Summer	2	+0%	30/15 Summer	100/30 Winter			53.474
1.009	313	15 Winter	2	+0%	30/15 Summer				53.279
6.000	15	15 Winter	2	+0%	30/15 Summer				54.769
6.001	15	60 Winter	2	+0%	30/15 Winter				54.564
6.002	314a	60 Winter	2	+0%	30/30 Winter				54.269
6.003	314	15 Winter	2	+0%	30/15 Summer				53.163
1.010	315a	15 Winter	2	+0%	30/15 Summer				53.163
1.011	315	15 Winter	2	+0%	30/15 Summer				53.144
1.012	316	15 Winter	2	+0%	30/15 Summer				53.078
1.013	18	15 Winter	2	+0%	30/15 Summer				53.038

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-
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PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
1.000	300	-0.202	0.000	0.21		15.0	OK	7
1.001	301	-0.078	0.000	0.75		18.3	OK	1
1.002	302	-0.089	0.000	0.80		56.0	OK	
2.000	303	-0.135	0.000	0.33		28.3	OK	1
1.003	304	-0.059	0.000	0.99		115.8	OK	
3.000	305	-0.087	0.000	0.67		47.9	OK	4
1.004	306	-0.112	0.000	0.91		165.0	OK	
1.005	307	-0.124	0.000	0.87		173.7	OK	
1.006	308	-0.167	0.000	0.80		173.2	OK	
4.000	309	-0.143	0.000	0.28		16.8	OK	2
4.001	310	-0.104	0.000	0.56		29.0	OK	2
1.007	311	-0.256	0.000	0.62		199.8	OK	
1.008	312	-0.267	0.000	0.59		202.0	OK	
5.000	Supermarket	-0.119	0.000	0.45		13.4	OK	1
1.009	313	-0.271	0.000	0.55		219.0	OK	
6.000	15	-0.231	0.000	0.68		157.3	OK	
6.001	15	-0.261	0.000	0.20		34.7	OK	
6.002	314a	-0.356	0.000	0.10		34.8	OK	
6.003	314	-0.276	0.000	0.07		13.4	OK	
1.010	315a	-0.172	0.000	0.75		222.8	OK	
1.011	315	-0.165	0.000	0.67		291.9	OK	
1.012	316	-0.114	0.000	0.84		299.6	OK	
1.013	18	-0.106	0.000	0.63		295.3	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-
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PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
7.000	W1	15 Summer	2	+0%					54.393
7.001	W2	15 Summer	2	+0%	30/15 Winter				53.646
7.002	W3	15 Summer	2	+0%	30/15 Summer				53.437
8.000	70a	15 Winter	2	+0%	100/15 Summer				53.857
7.003	W4	15 Winter	2	+0%	30/15 Summer				53.355
9.000	W5	15 Summer	2	+0%	100/15 Winter				54.307
9.001	W6	15 Summer	2	+0%	100/15 Winter				54.165
9.002	W7	15 Summer	2	+0%	100/15 Summer				53.965
7.004	W8	15 Winter	2	+0%	30/15 Summer				53.109
7.005	W9	15 Winter	2	+0%	30/15 Summer				53.021
7.006	W10	15 Winter	2	+0%	30/15 Summer	100/30 Winter			53.021
1.014	19	15 Summer	2	+0%	30/15 Summer				52.963
1.015	20	15 Winter	2	+0%	30/15 Summer				52.895
10.000	MHE1	15 Summer	2	+0%	100/120 Summer				53.125
10.001	MHE2	15 Summer	2	+0%	100/15 Winter				53.051
10.002	MHE3	15 Summer	2	+0%	30/180 Winter				52.957
10.003	MHE4	15 Summer	2	+0%	30/120 Winter				52.863
11.000	MHE5	15 Summer	2	+0%	100/120 Winter				53.172
11.001	MHE6	15 Summer	2	+0%	100/15 Winter				53.087
10.004	MHE7	15 Summer	2	+0%	30/15 Summer				52.708
10.005	MHE8	15 Winter	2	+0%	30/15 Summer				52.592
12.000	MHE9	15 Summer	2	+0%	30/180 Winter				52.993
12.001	MHE10	15 Summer	2	+0%	30/15 Winter				52.891
10.006	MHE11	15 Winter	2	+0%	30/15 Summer				52.608
10.007	MHE12	360 Winter	2	+0%	30/15 Summer				52.536
13.000	45	15 Winter	2	+0%	30/15 Summer				53.690
13.001	46	15 Winter	2	+0%	30/15 Summer				53.606
1.016	21	360 Winter	2	+0%	2/120 Winter				52.532
1.017	46	360 Winter	2	+0%					52.148
1.018	22	360 Winter	2	+0%					52.039

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		Exceeded
7.000	W1	-0.225	0.000	0.00			0.0		OK
7.001	W2	-0.225	0.000	0.00			0.0		OK
7.002	W3	-0.225	0.000	0.00			0.0		OK
8.000	70a	-0.193	0.000	0.05			3.3		OK
7.003	W4	-0.179	0.000	0.09			3.3		OK
9.000	W5	-0.225	0.000	0.00			0.0		OK
9.001	W6	-0.225	0.000	0.00			0.0		OK
9.002	W7	-0.225	0.000	0.00			0.0		OK
7.004	W8	-0.259	0.000	0.04			3.2		OK
7.005	W9	-0.154	0.000	0.03			3.6		OK
7.006	W10	-0.092	0.000	0.72			141.8		OK
1.014	19	0.000	0.000	1.03			342.6		OK
1.015	20	-0.032	0.000	1.00			401.7		OK
10.000	MHE1	-0.225	0.000	0.00			0.0		OK
10.001	MHE2	-0.225	0.000	0.00			0.0		OK
10.002	MHE3	-0.225	0.000	0.00			0.0		OK

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Flow (l/s)		
10.003	MHE4	-0.225	0.000	0.00			0.0		OK	
11.000	MHE5	-0.225	0.000	0.00			0.0		OK	
11.001	MHE6	-0.225	0.000	0.00			0.0		OK	
10.004	MHE7	-0.225	0.000	0.00			0.0		OK	
10.005	MHE8	-0.215	0.000	0.00			0.1		OK	
12.000	MHE9	-0.225	0.000	0.00			0.0		OK	
12.001	MHE10	-0.225	0.000	0.00			0.0		OK	
10.006	MHE11	-0.108	0.000	0.85			91.4		OK	
10.007	MHE12	-0.109	0.000	0.13			16.5		OK	
13.000	45	-0.110	0.000	0.50			19.4		OK	
13.001	46	-0.104	0.000	0.56			19.4		OK	
1.016	21	0.082	0.000	0.48			69.6	SURCHARGED		
1.017	46	-0.248	0.000	0.42			69.6		OK	
1.018	22	-0.207	0.000	0.57			69.6		OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-
NET-03-REVC.SWS

PN	US/MH Name	Surcharged Flooded			Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)				
1.000	300	1.722	4.894	0.60		42.7	FLOOD	7
1.001	301	2.222	0.000	2.36		57.2	SURCHARGED	1
1.002	302	2.247	0.000	1.51		105.4	SURCHARGED	
2.000	303	1.136	0.000	0.68		58.7	SURCHARGED	1
1.003	304	2.160	0.000	1.96		230.1	SURCHARGED	
3.000	305	1.956	0.000	1.21		86.4	SURCHARGED	4
1.004	306	1.755	0.000	1.76		320.1	SURCHARGED	
1.005	307	1.504	0.000	1.64		327.7	SURCHARGED	
1.006	308	1.297	0.000	1.48		320.8	SURCHARGED	
4.000	309	0.328	0.000	0.66		39.5	SURCHARGED	2
4.001	310	0.894	0.000	1.19		61.9	SURCHARGED	2
1.007	311	1.232	0.000	1.14		365.9	SURCHARGED	
1.008	312	1.220	0.000	1.06		364.6	SURCHARGED	
5.000	Supermarket	1.183	0.000	0.57		17.1	SURCHARGED	1
1.009	313	1.212	0.000	0.96		380.2	SURCHARGED	
6.000	15	0.104	0.000	1.67		390.2	SURCHARGED	
6.001	15	0.175	0.000	0.60	26	103.4	SURCHARGED	
6.002	314a	0.019	0.000	0.36		127.7	SURCHARGED	
6.003	314	1.165	0.000	0.81		147.2	SURCHARGED	
1.010	315a	1.254	0.000	1.54		454.1	SURCHARGED	
1.011	315	1.231	0.000	1.35		591.0	SURCHARGED	
1.012	316	1.126	0.000	1.70		609.7	SURCHARGED	
1.013	18	0.943	0.000	1.30		609.7	SURCHARGED	
7.000	W1	-0.225	0.000	0.00		0.0	OK	
7.001	W2	0.083	0.000	0.09		3.0	SURCHARGED	
7.002	W3	0.297	0.000	0.31		10.5	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.000	70a	30 Winter	30	+30%	100/15 Summer				53.978
7.003	W4	30 Winter	30	+30%	30/15 Summer				53.971
9.000	W5	15 Summer	30	+30%	100/15 Winter				54.307
9.001	W6	15 Summer	30	+30%	100/15 Winter				54.165
9.002	W7	30 Winter	30	+30%	100/15 Summer				53.966
7.004	W8	30 Winter	30	+30%	30/15 Summer				53.981
7.005	W9	30 Winter	30	+30%	30/15 Summer				54.003
7.006	W10	30 Winter	30	+30%	30/15 Summer	100/30 Winter			54.014
1.014	19	30 Winter	30	+30%	30/15 Summer				53.787
1.015	20	30 Winter	30	+30%	30/15 Summer				53.307
10.000	MHE1	240 Winter	30	+30%	100/120 Summer				53.243
10.001	MHE2	240 Winter	30	+30%	100/15 Winter				53.243
10.002	MHE3	240 Winter	30	+30%	30/180 Winter				53.244
10.003	MHE4	240 Winter	30	+30%	30/120 Winter				53.244
11.000	MHE5	240 Winter	30	+30%	100/120 Winter				53.243
11.001	MHE6	240 Winter	30	+30%	100/15 Winter				53.244
10.004	MHE7	240 Winter	30	+30%	30/15 Summer				53.244
10.005	MHE8	240 Winter	30	+30%	30/15 Summer				53.244
12.000	MHE9	240 Winter	30	+30%	30/180 Winter				53.244
12.001	MHE10	240 Winter	30	+30%	30/15 Winter				53.244
10.006	MHE11	240 Winter	30	+30%	30/15 Summer				53.244
10.007	MHE12	240 Winter	30	+30%	30/15 Summer				53.240
13.000	45	15 Winter	30	+30%	30/15 Summer				53.942
13.001	46	15 Winter	30	+30%	30/15 Summer				53.821
1.016	21	240 Winter	30	+30%	2/120 Winter				53.235
1.017	46	1440 Winter	30	+30%					52.192
1.018	22	1440 Winter	30	+30%					52.096

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
8.000	70a	-0.072	0.000	0.10			6.3	OK	
7.003	W4	0.437	0.000	0.47			16.3	SURCHARGED	
9.000	W5	-0.225	0.000	0.00			0.0	OK	
9.001	W6	-0.225	0.000	0.00			0.0	OK	
9.002	W7	-0.224	0.000	0.00			0.0	OK	
7.004	W8	0.613	0.000	0.27			19.3	SURCHARGED	
7.005	W9	0.828	0.000	0.22			23.5	SURCHARGED	
7.006	W10	0.901	0.000	1.35			267.9	SURCHARGED	1
1.014	19	0.824	0.000	2.64			875.1	SURCHARGED	
1.015	20	0.380	0.000	2.19			879.9	SURCHARGED	
10.000	MHE1	-0.107	0.000	0.00			0.0	OK	
10.001	MHE2	-0.033	0.000	0.01			0.2	OK	
10.002	MHE3	0.062	0.000	0.01			0.3	SURCHARGED	
10.003	MHE4	0.156	0.000	0.01			0.4	SURCHARGED	
11.000	MHE5	-0.154	0.000	0.00			0.0	OK	
11.001	MHE6	-0.068	0.000	0.00			0.1	OK	
10.004	MHE7	0.311	0.000	0.01			0.5	SURCHARGED	
10.005	MHE8	0.437	0.000	0.02			0.6	SURCHARGED	
12.000	MHE9	0.026	0.000	0.00			0.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Flow (l/s)		
12.001	MHE10	0.128	0.000	0.00			0.2		SURCHARGED	
10.006	MHE11	0.528	0.000	0.47			50.2		SURCHARGED	
10.007	MHE12	0.595	0.000	0.41			49.8		SURCHARGED	
13.000	45	0.142	0.000	1.14			43.9		SURCHARGED	
13.001	46	0.111	0.000	1.26			43.8		SURCHARGED	
1.016	21	0.785	0.000	0.66			95.0		SURCHARGED	
1.017	46	-0.204	0.000	0.57			95.2		OK	
1.018	22	-0.150	0.000	0.78			95.2		OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Surcharged Flooded		Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	
1.000	300	1.756	38.934	1.56			111.8	FLOOD 7
1.001	301	3.267	0.061	4.72			114.6	FLOOD 1
1.002	302	3.459	0.000	1.68			117.2	FLOOD RISK
2.000	303	2.595	1.048	0.81			69.6	FLOOD 1
1.003	304	3.440	0.000	2.24			263.1	FLOOD RISK
3.000	305	2.548	9.662	1.32			94.0	FLOOD 4
1.004	306	2.813	0.000	1.96			356.0	FLOOD RISK
1.005	307	2.511	0.000	1.87			373.1	SURCHARGED
1.006	308	2.235	0.000	1.66			361.1	SURCHARGED
4.000	309	1.403	0.066	0.68			40.8	FLOOD 2
4.001	310	1.877	1.311	1.03			53.5	FLOOD 2
1.007	311	2.139	0.000	1.18			380.7	SURCHARGED
1.008	312	2.099	0.000	1.13			387.5	SURCHARGED
5.000	Supermarket	2.008	0.632	0.87			25.8	FLOOD 1
1.009	313	2.063	0.000	1.06			417.6	SURCHARGED
6.000	15	0.463	0.000	1.72			400.2	SURCHARGED
6.001	15	0.627	0.000	0.60		27	104.7	SURCHARGED
6.002	314a	0.738	0.000	0.40			143.0	SURCHARGED
6.003	314	1.940	0.000	0.92			167.1	SURCHARGED
1.010	315a	2.049	0.000	1.58			466.0	FLOOD RISK
1.011	315	2.027	0.000	1.56			683.3	FLOOD RISK
1.012	316	1.848	0.000	2.00			714.4	FLOOD RISK
1.013	18	1.576	0.000	1.51			709.6	FLOOD RISK
7.000	W1	-0.056	0.000	0.02			1.6	OK
7.001	W2	0.694	0.000	0.20			7.1	SURCHARGED
7.002	W3	0.911	0.000	0.39			13.2	SURCHARGED

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-
NET-03-REVC.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
8.000	70a	30 Winter	100	+30%	100/15 Summer				54.601
7.003	W4	30 Winter	100	+30%	30/15 Summer				54.591
9.000	W5	30 Winter	100	+30%	100/15 Winter				54.589
9.001	W6	30 Winter	100	+30%	100/15 Winter				54.590
9.002	W7	30 Winter	100	+30%	100/15 Summer				54.591
7.004	W8	30 Winter	100	+30%	30/15 Summer				54.601
7.005	W9	30 Winter	100	+30%	30/15 Summer				54.642
7.006	W10	30 Winter	100	+30%	30/15 Summer	100/30 Winter			54.660
1.014	19	30 Winter	100	+30%	30/15 Summer				54.301
1.015	20	240 Winter	100	+30%	30/15 Summer				53.610
10.000	MHE1	240 Winter	100	+30%	100/120 Summer				53.607
10.001	MHE2	240 Winter	100	+30%	100/15 Winter				53.607
10.002	MHE3	240 Winter	100	+30%	30/180 Winter				53.607
10.003	MHE4	240 Winter	100	+30%	30/120 Winter				53.607
11.000	MHE5	240 Winter	100	+30%	100/120 Winter				53.607
11.001	MHE6	240 Winter	100	+30%	100/15 Winter				53.607
10.004	MHE7	240 Winter	100	+30%	30/15 Summer				53.608
10.005	MHE8	240 Winter	100	+30%	30/15 Summer				53.608
12.000	MHE9	240 Winter	100	+30%	30/180 Winter				53.608
12.001	MHE10	240 Winter	100	+30%	30/15 Winter				53.608
10.006	MHE11	240 Winter	100	+30%	30/15 Summer				53.608
10.007	MHE12	240 Winter	100	+30%	30/15 Summer				53.603
13.000	45	15 Winter	100	+30%	30/15 Summer				54.199
13.001	46	15 Winter	100	+30%	30/15 Summer				54.006
1.016	21	240 Winter	100	+30%	2/120 Winter				53.597
1.017	46	15 Winter	100	+30%					52.192
1.018	22	15 Winter	100	+30%					52.096

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
8.000	70a	0.551	0.000	0.12			7.5	SURCHARGED	
7.003	W4	1.058	0.000	0.57			19.9	SURCHARGED	
9.000	W5	0.057	0.000	0.05			2.2	SURCHARGED	
9.001	W6	0.200	0.000	0.20			6.9	SURCHARGED	
9.002	W7	0.401	0.000	0.18			21.3	SURCHARGED	
7.004	W8	1.233	0.000	0.52			36.9	SURCHARGED	
7.005	W9	1.467	0.000	0.38			40.4	FLOOD RISK	
7.006	W10	1.547	0.270	1.66			329.2	FLOOD	1
1.014	19	1.338	0.000	3.25			1080.7	FLOOD RISK	
1.015	20	0.683	0.000	1.20			481.9	SURCHARGED	
10.000	MHE1	0.257	0.000	0.00			0.0	SURCHARGED	
10.001	MHE2	0.331	0.000	0.01			0.2	SURCHARGED	
10.002	MHE3	0.425	0.000	0.01			0.3	SURCHARGED	
10.003	MHE4	0.519	0.000	0.01			0.4	SURCHARGED	
11.000	MHE5	0.210	0.000	0.00			0.0	SURCHARGED	
11.001	MHE6	0.295	0.000	0.00			0.2	SURCHARGED	
10.004	MHE7	0.675	0.000	0.02			0.6	SURCHARGED	
10.005	MHE8	0.801	0.000	0.02			0.6	SURCHARGED	
12.000	MHE9	0.390	0.000	0.00			0.0	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Surcharged		Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow	Volume						
12.001	MHE10	0.492	0.000	0.00					0.2	SURCHARGED	
10.006	MHE11	0.892	0.000	0.60					64.6	SURCHARGED	
10.007	MHE12	0.958	0.000	0.52					64.4	SURCHARGED	
13.000	45	0.399	0.000	1.43					55.2	FLOOD RISK	
13.001	46	0.296	0.000	1.58					54.9	SURCHARGED	
1.016	21	1.147	0.000	0.64					92.7	SURCHARGED	
1.017	46	-0.204	0.000	0.57					95.3	OK	
1.018	22	-0.150	0.000	0.78					95.3	OK	

Appendix C – Parcel R SW Network Simulation Report

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Midpoint	Arborfield - Parcel R	
Alencon Link	RMA Design - SWS	
Basingstoke, RG21 7PP		
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for PRELIM-NET-03-REVC.SWS

Pipe Sizes PRELIM-NET-03-REVC Manhole Sizes PRELIM-NET-03-REVC

FEH Rainfall Model	
Return Period (years)	1
FEH Rainfall Version	1999
Site Location GB 476950 165250 SU 76950 65250	
C (1km)	-0.028
D1 (1km)	0.261
D2 (1km)	0.255
D3 (1km)	0.327
E (1km)	0.303
F (1km)	2.642
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	1.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	0.75
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for PRELIM-NET-03-REVC.SWS

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.819	4-8	0.393

Total Area Contributing (ha) = 1.212

Total Pipe Volume (m³) = 37.351

Network Design Table for PRELIM-NET-03-REVC.SWS

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow	k (l/s)	HYD (mm)	DIA (mm)	Section	Type	Auto Design
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Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	E I.Area (ha)	E Base Flow	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
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Midpoint	Arborfield - Parcel R	
Alencon Link	RMA Design - SWS	
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Network Design Table for PRELIM-NET-03-REVC.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	11.162	0.100	111.6	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	38.056	0.751	50.7	0.171	0.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	30.475	0.203	150.1	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	10.650	0.071	150.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.002	39.498	0.340	116.2	0.097	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	15.204	0.187	81.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	65.133	0.518	125.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	34.566	0.118	292.9	0.286	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	17.712	0.179	98.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.000	30.861	0.171	180.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	25.420	0.141	180.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	19.536	0.109	179.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.003	2.644	0.015	176.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
4.000	36.577	0.416	87.9	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.006	19.300#	0.064	301.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.000	43.086	1.031	41.8	0.150	5.00	0.0	0.600	o	300	Pipe/Conduit	
5.001	48.113	0.281	171.2	0.150	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.002	11.400#	0.069	165.2	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.20	52.987	0.000	0.0	0.0	0.0	0.95	16.8	0.0
1.001	50.00	5.48	52.737	0.171	0.0	0.0	0.0	2.21	156.5	23.2
2.000	50.00	5.48	52.675	0.000	0.0	0.0	0.0	1.06	42.3	0.0
2.001	50.00	5.64	52.472	0.000	0.0	0.0	0.0	1.07	42.4	0.0
2.002	50.00	6.19	52.401	0.097	0.0	0.0	0.0	1.21	48.2	13.1
1.002	50.00	6.31	51.911	0.268	0.0	0.0	0.0	2.01	222.1	36.3
1.003	50.00	6.99	51.724	0.268	0.0	0.0	0.0	1.61	178.3	36.3
1.004	50.00	7.53	51.206	0.554	0.0	0.0	0.0	1.05	116.4	75.0
1.005	50.00	7.69	51.088	0.554	0.0	0.0	0.0	1.82	201.2	75.0
3.000	50.00	5.53	51.495	0.000	0.0	0.0	0.0	0.97	38.6	0.0
3.001	50.00	5.97	51.324	0.000	0.0	0.0	0.0	0.97	38.6	0.0
3.002	50.00	6.30	51.183	0.000	0.0	0.0	0.0	0.97	38.7	0.0
3.003	50.00	6.35	51.074	0.000	0.0	0.0	0.0	0.98	39.0	0.0
4.000	50.00	5.74	51.600	0.000	0.0	0.0	0.0	0.82	6.4	0.0
1.006	50.00	8.00	50.909	0.554	0.0	0.0	0.0	1.04	114.7	75.0
5.000	50.00	5.29	52.377	0.150	0.0	0.0	0.0	2.44	172.4	20.3
5.001	50.00	5.87	51.271	0.300	0.0	0.0	0.0	1.38	152.6	40.6
5.002	50.00	6.01	50.990	0.300	0.0	0.0	0.0	1.41	155.4	40.6

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Network Design Table for PRELIM-NET-03-REVC.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.007	15.604	0.052	300.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	4.962	0.017	291.9	0.358	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.007	50.00	8.29	50.800	0.854	0.0	0.0	0.0	0.90	63.8«	115.6
1.008	50.00	8.38	50.748	1.212	0.0	0.0	0.0	0.92	64.7«	164.1

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Manhole Schedules for PRELIM-NET-03-REVC.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	54.410	1.423	Open Manhole	1200	1.000	52.987	150				
2	54.328	1.591	Open Manhole	1200	1.001	52.737	300	1.000	52.887	150	
3b	54.176	1.501	Open Manhole	1200	2.000	52.675	225				
3a	54.463	1.991	Open Manhole	1200	2.001	52.472	225	2.000	52.472	225	
3	54.623	2.222	Open Manhole	1200	2.002	52.401	225	2.001	52.401	225	
3	54.614	2.703	Open Manhole	1350	1.002	51.911	375	1.001	51.986	300	
								2.002	52.061	225	
4	54.438	2.714	Open Manhole	1350	1.003	51.724	375	1.002	51.724	375	
6	53.769	2.563	Open Manhole	1350	1.004	51.206	375	1.003	51.206	375	
7	53.436	2.348	Open Manhole	1350	1.005	51.088	375	1.004	51.088	375	
13	52.920	1.425	Open Manhole	1200	3.000	51.495	225				
14	52.763	1.439	Open Manhole	1200	3.001	51.324	225	3.000	51.324	225	
15	53.032	1.849	Open Manhole	1200	3.002	51.183	225	3.001	51.183	225	
16	53.212	2.138	Open Manhole	1200	3.003	51.074	225	3.002	51.074	225	
17	52.900	1.300	Open Manhole	1200	4.000	51.600	100				
18	52.209	1.300	Open Manhole	1350	1.006	50.909	375	1.005	50.909	375	
								3.003	51.059	225	
								4.000	51.184	100	
19	53.881	1.504	Open Manhole	1200	5.000	52.377	300				
20	52.900	1.629	Open Manhole	1350	5.001	51.271	375	5.000	51.346	300	
21	52.629	1.639	Open Manhole	1350	5.002	50.990	375	5.001	50.990	375	
22	52.200	1.400	Open Manhole	1350	1.007	50.800	300	1.006	50.845	375	120
								5.002	50.921	375	196
8	52.711	1.963	Open Manhole	1200	1.008	50.748	300	1.007	50.748	300	
	51.500	0.769	Open Manhole	0		OUTFALL		1.008	50.731	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	477052.675	165169.091	477052.675	165169.091	Required	
2	477055.210	165179.962	477055.210	165179.962	Required	
3b	477053.735	165298.413	477053.735	165298.413	Required	
3a	477054.432	165267.946	477054.432	165267.946	Required	

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Manhole Schedules for PRELIM-NET-03-REVC.SWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
3	477052.570	165257.460	477052.570	165257.460	Required	
3	477054.580	165218.012	477054.580	165218.012	Required	
4	477069.778	165218.450	477069.778	165218.450	Required	
6	477131.502	165239.243	477131.502	165239.243	Required	
7	477164.039	165250.910	477164.039	165250.910	Required	
13	477244.376	165263.236	477244.376	165263.236	Required	
14	477217.087	165277.649	477217.087	165277.649	Required	
15	477191.705	165279.045	477191.705	165279.045	Required	
16	477176.875	165266.328	477176.875	165266.328	Required	
17	477187.101	165230.894	477187.101	165230.894	Required	
18	477174.473	165265.222	477174.473	165265.222	Required	
19	477114.842	165244.163	477114.842	165244.163	Required	
20	477097.683	165283.685	477097.683	165283.685	Required	
21	477138.237	165309.575	477138.237	165309.575	Required	
22	477157.666	165316.009	477157.666	165316.009	Required	
8	477160.112	165331.420	477160.112	165331.420	Required	
	477156.968	165335.259			No Entry	

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	1	54.410	52.987	1.273	Open Manhole	1200
1.001	o	300	2	54.328	52.737	1.291	Open Manhole	1200
2.000	o	225	3b	54.176	52.675	1.276	Open Manhole	1200
2.001	o	225	3a	54.463	52.472	1.766	Open Manhole	1200
2.002	o	225	3	54.623	52.401	1.997	Open Manhole	1200
1.002	o	375	3	54.614	51.911	2.328	Open Manhole	1350
1.003	o	375	4	54.438	51.724	2.339	Open Manhole	1350
1.004	o	375	6	53.769	51.206	2.188	Open Manhole	1350
1.005	o	375	7	53.436	51.088	1.973	Open Manhole	1350
3.000	o	225	13	52.920	51.495	1.200	Open Manhole	1200
3.001	o	225	14	52.763	51.324	1.214	Open Manhole	1200
3.002	o	225	15	53.032	51.183	1.624	Open Manhole	1200
3.003	o	225	16	53.212	51.074	1.913	Open Manhole	1200
4.000	o	100	17	52.900	51.600	1.200	Open Manhole	1200
1.006	o	375	18	52.209	50.909	0.925	Open Manhole	1350
5.000	o	300	19	53.881	52.377	1.204	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.162	111.6	2	54.328	52.887	1.291	Open Manhole	1200
1.001	38.056	50.7	3	54.614	51.986	2.328	Open Manhole	1350
2.000	30.475	150.1	3a	54.463	52.472	1.766	Open Manhole	1200
2.001	10.650	150.0	3	54.623	52.401	1.997	Open Manhole	1200
2.002	39.498	116.2	3	54.614	52.061	2.328	Open Manhole	1350
1.002	15.204	81.3	4	54.438	51.724	2.339	Open Manhole	1350
1.003	65.133	125.7	6	53.769	51.206	2.188	Open Manhole	1350
1.004	34.566	292.9	7	53.436	51.088	1.973	Open Manhole	1350
1.005	17.712	98.9	18	52.209	50.909	0.925	Open Manhole	1350
3.000	30.861	180.0	14	52.763	51.324	1.214	Open Manhole	1200
3.001	25.420	180.3	15	53.032	51.183	1.624	Open Manhole	1200
3.002	19.536	179.2	16	53.212	51.074	1.913	Open Manhole	1200
3.003	2.644	176.3	18	52.209	51.059	0.925	Open Manhole	1350
4.000	36.577	87.9	18	52.209	51.184	0.925	Open Manhole	1350
1.006	19.300#	301.6	22	52.200	50.845	0.980	Open Manhole	1350
5.000	43.086	41.8	20	52.900	51.346	1.254	Open Manhole	1350

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PIPELINE SCHEDULES for PRELIM-NET-03-REVC.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.001	o	375	20	52.900	51.271	1.254	Open Manhole	1350
5.002	o	375	21	52.629	50.990	1.264	Open Manhole	1350
1.007	o	300	22	52.200	50.800	1.100	Open Manhole	1350
1.008	o	300	8	52.711	50.748	1.663	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
5.001	48.113	171.2	21	52.629	50.990	1.264	Open Manhole	1350
5.002	11.400#	165.2	22	52.200	50.921	0.904	Open Manhole	1350
1.007	15.604	300.1	8	52.711	50.748	1.663	Open Manhole	1200
1.008	4.962	291.9		51.500	50.731	0.469	Open Manhole	0

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Area Summary for PRELIM-NET-03-REVC.SWS

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.171	0.171	0.171
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.097	0.097	0.097
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.286	0.286	0.286
1.005	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.000	0.000	0.000
3.002	-	-	100	0.000	0.000	0.000
3.003	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.150	0.150	0.150
5.001	-	-	100	0.150	0.150	0.150
5.002	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.358	0.358	0.358
				Total	Total	Total
				1.212	1.212	1.212

Free Flowing Outfall Details for PRELIM-NET-03-REVC.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.008		51.500	50.731	0.000	0	0

Simulation Criteria for PRELIM-NET-03-REVC.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
		Number of Storage Structures	1
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
FEH Rainfall Version	1999
Site Location	GB 476950 165250 SU 76950 65250
C (1km)	-0.028
D1 (1km)	0.261
D2 (1km)	0.255
D3 (1km)	0.327

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<u>Synthetic Rainfall Details</u> E (1km) 0.303 F (1km) 2.642 Summer Storms Yes Winter Storms No Cv (Summer) 0.750 Cv (Winter) 0.840 Storm Duration (mins) 30		
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Online Controls for PRELIM-NET-03-REVC.SWS

Hydro-Brake® Optimum Manhole: 22, DS/PN: 1.007, Volume (m³): 5.1

Unit Reference MD-CHE-0166-1690-1500-1690

Design Head (m)1.500

Design Flow (l/s)16.9

Flush-Flo™Calculated

ObjectiveMinimise upstream storage

ApplicationSurface

Sump AvailableNo

Diameter (mm)166

Invert Level (m)50.800

Minimum Outlet Pipe Diameter (mm)225

Suggested Manhole Diameter (mm)1200

Control Points

Head (m)

Flow (l/s)

Design Point (Calculated)1.50016.9

Flush-Flo™0.35916.9

Control Points

Head (m)

Flow (l/s)

Kick-Flo®0.49510.0

Mean Flow over Head Range-12.6

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)

Depth (m)

Flow (l/s)

0.1004.9

0.20011.5

0.30015.7

0.40015.3

0.50010.0

0.60010.8

0.80012.4

1.00013.9

1.20015.1

1.40016.3

1.60017.4

1.80018.5

2.00019.5

2.20020.4

2.40021.3

2.60022.1

3.00023.7

3.50025.6

4.00027.3

4.50029.0

5.00030.5

5.50032.0

6.00033.4

6.50034.7

7.00036.0

7.50037.2

8.00038.4

8.50039.6

9.00040.7

9.50041.8

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Storage Structures for PRELIM-NET-03-REVC.SWS

Tank or Pond Manhole: 22, DS/PN: 1.007

Invert Level (m) 50.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	328.0	1.500	764.0	1.510	0.0	1.800	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH D3 (1km) 0.327
 FEH Rainfall Version 1999 E (1km) 0.303
 Site Location GB 476950 165250 SU 76950 65250 F (1km) 2.642
 C (1km) -0.028 Cv (Summer) 0.750
 D1 (1km) 0.261 Cv (Winter) 0.840
 D2 (1km) 0.255

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 30, 30

										Water	Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	
1.000	1	15 Summer	2	+0%	30/15 Summer				52.987	-0.150	
1.001	2	15 Winter	2	+0%	30/15 Summer	100/15 Summer			52.833	-0.204	
2.000	3b	15 Summer	2	+0%	30/15 Summer	100/15 Summer			52.675	-0.225	
2.001	3a	15 Winter	2	+0%	30/15 Summer	100/15 Summer			52.486	-0.211	
2.002	3	15 Winter	2	+0%	30/15 Summer	100/15 Summer			52.500	-0.126	
1.002	3	15 Winter	2	+0%	30/15 Summer				52.052	-0.234	
1.003	4	15 Winter	2	+0%	30/15 Summer				51.864	-0.235	
1.004	6	15 Winter	2	+0%	30/15 Summer	100/15 Summer			51.500	-0.081	
1.005	7	15 Winter	2	+0%	30/15 Summer				51.298	-0.165	
3.000	13	15 Summer	2	+0%	100/15 Summer				51.495	-0.225	
3.001	14	15 Summer	2	+0%	30/15 Summer				51.324	-0.225	
3.002	15	15 Winter	2	+0%	30/15 Summer				51.196	-0.212	
3.003	16	15 Winter	2	+0%	30/15 Summer				51.220	-0.079	
4.000	17	15 Summer	2	+0%	30/15 Winter				51.600	-0.100	
1.006	18	15 Winter	2	+0%	30/15 Summer				51.223	-0.061	
5.000	19	15 Winter	2	+0%	100/15 Summer				52.470	-0.207	
5.001	20	15 Winter	2	+0%	30/15 Summer	100/15 Summer			51.445	-0.201	
5.002	21	15 Winter	2	+0%	30/15 Summer				51.192	-0.173	
1.007	22	120 Winter	2	+0%	30/15 Summer				51.096	-0.004	
1.008	8	15 Winter	2	+0%	30/15 Summer	100/15 Summer			51.048	0.000	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow			Time (mins)				
1.000	1	0.000	0.00					0.0	OK	
1.001	2	0.000	0.22					32.0	OK	4
2.000	3b	0.000	0.00					0.0	OK	4
2.001	3a	0.000	0.00					0.1	OK	2
2.002	3	0.000	0.40					18.3	OK	2
1.002	3	0.000	0.30					50.6	OK	
1.003	4	0.000	0.29					49.5	OK	
1.004	6	0.000	0.95					99.5	OK	2
1.005	7	0.000	0.60					98.7	OK	
3.000	13	0.000	0.00					0.0	OK	
3.001	14	0.000	0.00					0.0	OK	
3.002	15	0.000	0.00					0.2	OK	
3.003	16	0.000	0.07					2.0	OK	
4.000	17	0.000	0.00					0.0	OK	
1.006	18	0.000	1.00					95.6	OK	
5.000	19	0.000	0.21					33.0	OK	
5.001	20	0.000	0.43					60.7	OK	2
5.002	21	0.000	0.56					59.9	OK	
1.007	22	0.000	0.23					12.6	OK	
1.008	8	0.000	1.22					56.9	OK	2

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Midpoint	Arborfield - Parcel R	
Alencon Link	RMA Design - SWS	
Basingstoke, RG21 7PP		
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH D3 (1km) 0.327
FEH Rainfall Version 1999 E (1km) 0.303
Site Location GB 476950 165250 SU 76950 65250 F (1km) 2.642
C (1km) -0.028 Cv (Summer) 0.750
D1 (1km) 0.261 Cv (Winter) 0.840
D2 (1km) 0.255

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 30, 30

									Water	Surcharged	
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.		(m)	(m)
1.000	1	15 Winter	30	+30%	30/15 Summer					54.020	0.883
1.001	2	15 Winter	30	+30%	30/15 Summer	100/15 Summer				54.048	1.011
2.000	3b	15 Winter	30	+30%	30/15 Summer	100/15 Summer				53.975	1.075
2.001	3a	15 Winter	30	+30%	30/15 Summer	100/15 Summer				53.993	1.296
2.002	3	15 Winter	30	+30%	30/15 Summer	100/15 Summer				54.023	1.397
1.002	3	15 Winter	30	+30%	30/15 Summer					53.703	1.417
1.003	4	15 Winter	30	+30%	30/15 Summer					53.584	1.485
1.004	6	15 Winter	30	+30%	30/15 Summer	100/15 Summer				53.277	1.696
1.005	7	15 Winter	30	+30%	30/15 Summer					52.298	0.835
3.000	13	15 Winter	30	+30%	100/15 Summer					51.715	-0.005
3.001	14	15 Winter	30	+30%	30/15 Summer					51.716	0.167
3.002	15	15 Winter	30	+30%	30/15 Summer					51.717	0.309
3.003	16	15 Winter	30	+30%	30/15 Summer					51.727	0.428
4.000	17	15 Winter	30	+30%	30/15 Winter					51.731	0.031
1.006	18	15 Winter	30	+30%	30/15 Summer					51.739	0.455
5.000	19	15 Winter	30	+30%	100/15 Summer					52.614	-0.063
5.001	20	15 Winter	30	+30%	30/15 Summer	100/15 Summer				52.180	0.534
5.002	21	120 Winter	30	+30%	30/15 Summer					51.579	0.214
1.007	22	120 Winter	30	+30%	30/15 Summer					51.577	0.477
1.008	8	15 Winter	30	+30%	30/15 Summer	100/15 Summer				52.110	1.062

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Midpoint Alencon Link Basingstoke, RG21 7PP	Arborfield - Parcel R RMA Design - SWS	
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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Pipe		Status	Level Exceeded
		Volume (m ³)	Flow			Time (mins)	Flow (l/s)		
1.000	1	0.000	0.50				7.5	SURCHARGED	
1.001	2	0.000	0.71				103.0	FLOOD RISK	4
2.000	3b	0.000	0.17				6.9	FLOOD RISK	4
2.001	3a	0.000	0.54				19.2	SURCHARGED	2
2.002	3	0.000	1.05				47.8	SURCHARGED	2
1.002	3	0.000	0.84				141.5	SURCHARGED	
1.003	4	0.000	0.86				144.4	SURCHARGED	
1.004	6	0.000	2.80				292.1	SURCHARGED	2
1.005	7	0.000	1.76				291.5	SURCHARGED	
3.000	13	0.000	0.02				0.7	OK	
3.001	14	0.000	0.11				4.1	SURCHARGED	
3.002	15	0.000	0.14				4.8	SURCHARGED	
3.003	16	0.000	0.20				5.4	SURCHARGED	
4.000	17	0.000	0.10				0.7	SURCHARGED	
1.006	18	0.000	2.90				277.1	SURCHARGED	
5.000	19	0.000	0.66				105.9	OK	
5.001	20	0.000	1.47				206.3	SURCHARGED	2
5.002	21	0.000	0.42				45.4	SURCHARGED	
1.007	22	0.000	0.29				15.7	SURCHARGED	
1.008	8	0.000	5.53				257.1	SURCHARGED	2

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for PRELIM-NET-03-REVC.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe	Status	Level Exceeded
		Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	Flow (l/s)		
1.000	1	0.000	1.17			17.7	FLOOD RISK	
1.001	2	21.896	0.97			140.8	FLOOD	4
2.000	3b	10.417	1.15			45.7	FLOOD	4
2.001	3a	1.375	1.48			52.6	FLOOD	2
2.002	3	0.677	1.35			61.7	FLOOD	2
1.002	3	0.000	1.12			189.2	SURCHARGED	
1.003	4	0.000	1.10			184.6	SURCHARGED	
1.004	6	15.398	3.19			332.9	FLOOD	2
1.005	7	0.000	2.01			332.4	SURCHARGED	
3.000	13	0.000	0.05			1.9	SURCHARGED	
3.001	14	0.000	0.09			3.4	SURCHARGED	
3.002	15	0.000	0.13			4.5	SURCHARGED	
3.003	16	0.000	0.22			6.1	SURCHARGED	
4.000	17	0.000	0.22			1.4	SURCHARGED	
1.006	18	0.000	3.31			316.4	FLOOD RISK	
5.000	19	0.000	0.95			152.8	FLOOD RISK	
5.001	20	2.532	1.99			279.9	FLOOD	2
5.002	21	0.000	0.60			64.2	SURCHARGED	
1.007	22	0.000	0.29			15.7	SURCHARGED	
1.008	8	9.900	7.04			327.0	FLOOD	2

Appendix D – District Centre FW Network Simulation Report

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Midpoint Alencon Link Basingstoke, RG21 7PP	Arborfield - District Centre RMA - FWS	
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FOUL SEWERAGE DESIGN

Design Criteria for PRELIM-NET-01-REVG.FWS

Pipe Sizes PRELIM-NET-01-REVG Manhole Sizes PRELIM-NET-01-REVG

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	10
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.050
Flow Per Person (l/per/day)	225.00	Maximum Backdrop Height (m)	0.000
Persons per House	3.00	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for PRELIM-NET-01-REVG.FWS

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	33.471	1.700	19.7	0.000	10	0.0	1.500	o	150	Pipe/Conduit	
F1.001	31.976	1.300	24.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F1.002	10.738	0.400	26.8	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F2.000	15.959	1.325	12.0	0.000	10	0.0	1.500	o	150	Pipe/Conduit	
F1.003	28.424	0.412	69.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F1.004	69.954	0.568	123.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.000	36.315	1.250	29.1	0.000	150	0.0	1.500	o	150	Pipe/Conduit	
F3.001	22.449	0.630	35.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.002	23.360	0.700	33.4	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F3.003	12.818	0.500	25.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	59.800	0.000	0.0	10	0.0	13	0.69	1.98	35.0	0.5
F1.001	58.100	0.000	0.0	10	0.0	14	0.64	1.77	31.3	0.5
F1.002	56.800	0.000	0.0	10	0.0	14	0.62	1.70	30.0	0.5
F2.000	57.825	0.000	0.0	10	0.0	12	0.82	2.53	44.8	0.5
F1.003	56.400	0.000	0.0	20	0.1	24	0.56	1.06	18.7	1.0
F1.004	55.988	0.000	0.0	20	0.1	28	0.46	0.79	13.9	1.0
F3.000	58.500	0.000	0.0	150	0.7	53	1.38	1.63	28.8	7.7
F3.001	57.250	0.000	0.0	150	0.7	56	1.28	1.47	26.0	7.7
F3.002	56.620	0.000	0.0	150	0.7	55	1.31	1.52	26.9	7.7
F3.003	55.920	0.000	0.0	150	0.7	51	1.44	1.74	30.7	7.7

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F4.000	52.732	0.600	87.9	0.000	30	0.0	1.500	o	150	Pipe/Conduit	
F5.000	18.333	0.125	146.7	0.000	16	0.0	1.500	o	150	Pipe/Conduit	
F5.001	36.018	0.400	90.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F5.002	15.490	0.110	140.8	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F4.001	43.770	0.600	73.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F6.000	52.813	0.700	75.4	0.000	16	0.0	1.500	o	150	Pipe/Conduit	
F4.002	9.750	0.130	75.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F4.003	21.509	0.400	53.8	0.000	18	0.0	1.500	o	150	Pipe/Conduit	
F4.004	28.659	0.300	95.5	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F4.005	46.476	0.500	93.0	0.000	15	0.0	1.500	o	150	Pipe/Conduit	
F4.006	6.591	0.500	13.2	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F1.005	24.181	0.179	135.1	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.006	21.894	0.162	135.1	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.007	17.772	0.132	135.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.008	13.393	0.099	135.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F7.000	38.002	0.550	69.1	0.000	40	0.0	1.500	o	150	Pipe/Conduit	
F7.001	31.052	0.450	69.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F4.000	58.500	0.000	0.0	30	0.1	31	0.58	0.93	16.5	1.5
F5.000	58.500	0.000	0.0	16	0.1	26	0.40	0.72	12.8	0.8
F5.001	58.375	0.000	0.0	16	0.1	23	0.48	0.92	16.3	0.8
F5.002	57.975	0.000	0.0	16	0.1	26	0.41	0.74	13.0	0.8
F4.001	57.865	0.000	0.0	46	0.2	37	0.70	1.03	18.1	2.4
F6.000	58.000	0.000	0.0	16	0.1	22	0.51	1.01	17.8	0.8
F4.002	57.265	0.000	0.0	62	0.3	43	0.76	1.01	17.9	3.2
F4.003	57.135	0.000	0.0	80	0.4	45	0.92	1.20	21.1	4.1
F4.004	56.735	0.000	0.0	80	0.4	52	0.75	0.90	15.8	4.1
F4.005	56.435	0.000	0.0	95	0.4	57	0.80	0.91	16.1	4.9
F4.006	55.935	0.000	0.0	95	0.4	34	1.60	2.42	42.8	4.9
F1.005	55.345	0.000	0.0	265	1.2	92	0.90	0.99	39.2	13.7
F1.006	55.166	0.000	0.0	265	1.2	92	0.90	0.99	39.2	13.7
F1.007	55.004	0.000	0.0	265	1.2	92	0.90	0.99	39.2	13.7
F1.008	54.872	0.000	0.0	265	1.2	92	0.90	0.99	39.3	13.7
F7.000	55.850	0.000	0.0	40	0.2	34	0.69	1.05	18.6	2.1
F7.001	55.300	0.000	0.0	40	0.2	34	0.69	1.06	18.7	2.1

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.009	42.388	0.500	84.8	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F8.000	52.455	2.700	19.4	0.000	80	0.0	1.500	o	150	Pipe/Conduit	
F8.001	27.624	0.100	276.2	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F8.002	24.099	0.387	62.3	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F1.010	15.824	0.068	233.0	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F9.000	61.927	0.798	77.6	0.000	60	0.0	1.500	o	150	Pipe/Conduit	
F1.011	23.009	0.153	150.4	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.012	63.109	0.420	150.3	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.013	69.866	0.462	151.2	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.014	47.805	0.245	195.1	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F10.000	48.569	0.626	77.6	0.000	11	0.0	1.500	o	150	Pipe/Conduit	
F10.001	55.488	0.715	77.6	0.000	4	0.0	1.500	o	150	Pipe/Conduit	
F11.000	48.385	1.040	46.5	0.000	11	0.0	1.500	o	150	Pipe/Conduit	
F10.002	40.390	0.521	77.5	0.000	4	0.0	1.500	o	150	Pipe/Conduit	
F10.003	32.624	0.502	65.0	0.000	8	0.0	1.500	o	150	Pipe/Conduit	
F1.015	37.324	0.187	199.6	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.009	54.773	0.000	0.0	305	1.4	87	1.11	1.25	49.6	15.7
F8.000	57.500	0.000	0.0	80	0.4	35	1.33	1.99	35.2	4.1
F8.001	54.800	0.000	0.0	80	0.4	70	0.51	0.52	9.3	4.1
F8.002	54.700	0.000	0.0	80	0.4	47	0.88	1.11	19.6	4.1
F1.010	54.238	0.000	0.0	385	1.8	134	0.80	0.75	29.8	19.9
F9.000	55.050	0.000	0.0	60	0.3	43	0.75	0.99	17.6	3.1
F1.011	54.170	0.000	0.0	445	2.1	128	0.98	0.94	37.2	22.9
F1.012	54.017	0.000	0.0	445	2.1	128	0.98	0.94	37.2	22.9
F1.013	53.597	0.000	0.0	445	2.1	128	0.98	0.93	37.1	22.9
F1.014	53.135	0.000	0.0	445	2.1	139	0.89	0.82	32.6	22.9
F10.000	56.500	0.000	0.0	11	0.1	19	0.45	1.00	17.6	0.6
F10.001	55.874	0.000	0.0	15	0.1	22	0.49	0.99	17.6	0.8
F11.000	56.200	0.000	0.0	11	0.1	17	0.53	1.29	22.7	0.6
F10.002	55.159	0.000	0.0	30	0.1	30	0.61	1.00	17.6	1.5
F10.003	54.638	0.000	0.0	38	0.2	33	0.69	1.09	19.2	2.0
F1.015	52.890	0.000	0.0	483	2.3	149	0.89	0.81	32.2	24.9

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.016	28.510	0.143	199.4	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F12.000	9.484	0.125	75.9	0.000	0	0.6	1.500	o	150	Pipe/Conduit	
F1.017	58.718	0.301	195.1	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F13.000	5.276	0.230	22.9	0.000	120	0.0	1.500	o	225	Pipe/Conduit	
F1.018	48.984	0.217	225.7	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F14.000	13.606	0.105	129.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.001	20.746	0.160	129.7	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F15.000	9.686	0.125	77.5	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.002	35.494	0.273	130.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.003	12.110	0.122	99.3	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F16.000	13.408	0.249	53.8	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F16.001	42.683	0.327	130.5	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.004	19.399	0.140	138.6	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.005	27.193	0.209	130.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F14.006	48.628	0.577	84.3	0.000	0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.016	52.703	0.000	0.0	483	2.3	149	0.90	0.81	32.3	24.9
F12.000	52.660	0.000	0.6	0	0.1	20	0.47	1.01	17.8	0.7
F1.017	52.460	0.000	0.6	483	2.3	150	0.91	0.82	32.6	25.6
F13.000	52.470	0.000	0.0	120	0.6	39	1.35	2.40	95.5	6.2
F1.018	52.084	0.000	0.6	603	2.9	148	0.92	0.92	65.1	31.8
F14.000	53.603	0.000	0.0	0	0.0	0	0.00	0.77	13.6	0.0
F14.001	53.498	0.000	0.0	0	0.0	0	0.00	0.77	13.6	0.0
F15.000	53.483	0.000	0.0	0	0.0	0	0.00	1.00	17.6	0.0
F14.002	53.338	0.000	0.0	0	0.0	0	0.00	0.77	13.6	0.0
F14.003	53.065	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F16.000	54.295	0.000	0.0	0	0.0	0	0.00	1.20	21.1	0.0
F16.001	54.046	0.000	0.0	0	0.0	0	0.00	0.77	13.5	0.0
F14.004	52.943	0.000	0.0	0	0.0	0	0.00	0.74	13.1	0.0
F14.005	52.803	0.000	0.0	0	0.0	0	0.00	0.77	13.6	0.0
F14.006	52.594	0.000	0.0	0	0.0	0	0.00	0.95	16.9	0.0

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.019	10.068	0.046	218.9	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.020	11.591	0.052	222.9	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.021	25.420	0.115	221.0	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F17.000	20.764	0.208	100.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F17.001	33.400	0.334	100.0	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F17.002	11.421	0.114	100.2	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F17.003	16.491	0.165	99.9	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F17.004	31.245	0.312	100.1	0.000	0	0.0	1.500	o	150	Pipe/Conduit	
F1.022	19.834	0.090	220.4	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.023	18.518	0.087	212.9	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.024	20.301	0.089	228.1	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.025	19.672	0.094	209.3	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.026	13.986	0.063	222.0	0.000	0	0.2	1.500	o	300	Pipe/Conduit	
F1.027	31.223	0.143	218.3	0.000	166	0.0	1.500	o	300	Pipe/Conduit	
F18.000	44.808	0.700	64.0	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F1.028	17.910	0.078	229.6	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.029	45.041	0.205	219.7	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F19.000	40.786	0.837	48.7	0.000	0	0.0	1.500	o	100	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.019	51.867	0.000	0.6	603	2.9	147	0.93	0.94	66.1	31.8
F1.020	51.821	0.000	0.6	603	2.9	147	0.92	0.93	65.5	31.8
F1.021	51.769	0.000	0.6	603	2.9	147	0.92	0.93	65.8	31.8
F17.000	53.051	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F17.001	52.843	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F17.002	52.509	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F17.003	52.395	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F17.004	52.230	0.000	0.0	0	0.0	0	0.00	0.88	15.5	0.0
F1.022	51.654	0.000	0.6	603	2.9	147	0.92	0.93	65.9	31.8
F1.023	51.564	0.000	0.6	603	2.9	145	0.94	0.95	67.1	31.8
F1.024	51.477	0.000	0.6	603	2.9	148	0.91	0.92	64.8	31.8
F1.025	51.388	0.000	0.6	603	2.9	145	0.94	0.96	67.7	31.8
F1.026	51.294	0.000	0.8	603	2.9	148	0.92	0.93	65.7	32.0
F1.027	51.231	0.000	0.8	769	3.7	170	0.98	0.94	66.2	40.5
F18.000	53.200	0.000	0.0	0	0.0	0	0.00	0.83	6.5	0.0
F1.028	51.088	0.000	0.8	769	3.7	172	0.96	0.91	64.6	40.5
F1.029	51.010	0.000	0.8	769	3.7	170	0.98	0.93	66.0	40.5
F19.000	51.842	0.000	0.0	0	0.0	0	0.00	0.95	7.5	0.0

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.030	14.264	0.065	219.4	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.031	36.187	0.114	317.4	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F1.032	6.503	0.086	75.6	0.000	47	0.0	1.500	o	300	Pipe/Conduit	
F20.000	11.281	0.141	80.0	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F20.001	27.932	0.349	80.0	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F20.002	9.846	0.136	72.4	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F1.033	14.950	0.064	233.6	0.000	0	0.0	1.500	o	300	Pipe/Conduit	
F21.000	25.205	0.090	280.1	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F21.001	35.354	0.090	392.8	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.034	33.216	0.160	207.6	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F22.000	33.969	0.423	80.2	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F22.001	25.865	0.322	80.3	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F22.002	18.837	0.235	80.2	0.000	0	0.0	1.500	o	100	Pipe/Conduit	
F1.035	34.552	0.150	230.3	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.036	92.912	0.340	273.3	0.000	0	0.0	1.500	o	225	Pipe/Conduit	
F1.037	43.256	0.150	288.4	0.000	0	4.4	1.500	o	225	Pipe/Conduit	
F1.038	81.690	0.180	453.8	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.030	50.805	0.000	0.8	769	3.7	170	0.98	0.93	66.1	40.5
F1.031	50.740	0.000	0.8	769	3.7	192	0.85	0.78	54.9	40.5
F1.032	50.626	0.000	0.8	816	3.9	128	1.49	1.60	112.8	43.0
F20.000	51.342	0.000	0.0	0	0.0	0	0.00	0.74	5.8	0.0
F20.001	51.042	0.000	0.0	0	0.0	0	0.00	0.74	5.8	0.0
F20.002	50.693	0.000	0.0	0	0.0	0	0.00	0.78	6.1	0.0
F1.033	50.357	0.000	0.8	816	3.9	180	0.97	0.91	64.0	43.0
F21.000	50.360	0.000	0.0	0	0.0	0	0.00	0.68	27.2	0.0
F21.001	50.270	0.000	0.0	0	0.0	0	0.00	0.58	22.9	0.0
F1.034	50.180	0.000	0.8	816	3.9	225	0.80	0.80	31.6«	43.0
F22.000	51.620	0.000	0.0	0	0.0	0	0.00	0.74	5.8	0.0
F22.001	51.197	0.000	0.0	0	0.0	0	0.00	0.74	5.8	0.0
F22.002	50.875	0.000	0.0	0	0.0	0	0.00	0.74	5.8	0.0
F1.035	50.020	0.000	0.8	816	3.9	225	0.75	0.75	30.0«	43.0
F1.036	49.870	0.000	0.8	816	3.9	225	0.69	0.69	27.5«	43.0
F1.037	49.530	0.000	5.2	816	4.3	225	0.67	0.67	26.8«	47.8
F1.038	49.380	0.000	5.2	816	4.3	225	0.54	0.54	21.3«	47.8

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Network Design Table for PRELIM-NET-01-REVG.FWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Houses	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.039	61.305	0.200	306.5	0.000	0	0.0	1.500	o	225	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Hse Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.039	49.200	0.000	5.2	816	4.3	225	0.65	0.65	26.0« 47.8

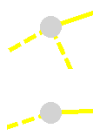
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Manhole Schedules for PRELIM-NET-01-REV.G.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F101	476402.574	164935.055	476402.574	164935.055	Required	
F102	476432.788	164945.523	476432.788	164945.523	Required	
F103	476454.830	164942.744	476454.830	164942.744	Required	
F104	476441.596	164951.664	476441.596	164951.664	Required	
F105	476463.033	164970.329	476463.033	164970.329	Required	
F106	476474.742	165093.218	476474.742	165093.218	Required	
F107	476500.395	165067.514	476500.395	165067.514	Required	
F108	476507.445	165046.200	476507.445	165046.200	Required	
F109	476508.537	165022.866	476508.537	165022.866	Required	
F110	476453.115	164849.312	476453.115	164849.312	Required	
F111	476433.787	164909.881	476433.787	164909.881	Required	
F112	476452.119	164910.052	476452.119	164910.052	Required	
F113	476483.131	164891.735	476483.131	164891.735	Required	
F114	476494.825	164881.576	476494.825	164881.576	Required	
F115	476469.868	164944.433	476469.868	164944.433	Required	
F116	476516.485	164919.612	476516.485	164919.612	Required	
F117	476525.086	164915.019	476525.086	164915.019	Required	

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Manhole Schedules for PRELIM-NET-01-REVG.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F118	476534.302	164934.454	476534.302	164934.454	Required	
F119	476531.733	164962.997	476531.733	164962.997	Required	
F120	476521.016	165008.221	476521.016	165008.221	Required	
F121	476517.732	165013.936	476517.732	165013.936	Required	
F122	476541.349	165019.126	476541.349	165019.126	Required	
F123	476562.533	165024.658	476562.533	165024.658	Required	
F124	476574.502	165037.795	476574.502	165037.795	Required	
F125	476607.670	164980.354	476607.670	164980.354	Required	
F126	476599.093	165017.376	476599.093	165017.376	Required	
F127	476585.574	165045.331	476585.574	165045.331	Required	
F128	476584.660	165160.170	476584.660	165160.170	Required	
F129	476611.404	165115.045	476611.404	165115.045	Required	
F130	476611.329	165087.421	476611.329	165087.421	Required	
F131	476622.533	165066.085	476622.533	165066.085	Required	
F132	476662.630	165017.861	476662.630	165017.861	Required	
F133	476636.289	165073.907	476636.289	165073.907	Required	
F134	476658.127	165081.155	476658.127	165081.155	Required	

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Midpoint Alencon Link Basingstoke, RG21 7PP	Arborfield - District Centre RMA - FWS	
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Manhole Schedules for PRELIM-NET-01-REV.G.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F135	476721.166	165084.141	476721.166	165084.141	Required	
F136	476790.941	165087.694	476790.941	165087.694	Required	
F137	476829.777	164880.387	476829.777	164880.387	Required	
F138	476831.796	164928.914	476831.796	164928.914	Required	
F139	476782.105	164984.437	476782.105	164984.437	Required	
F140	476830.490	164984.386	476830.490	164984.386	Required	
F141	476828.863	165024.743	476828.863	165024.743	Required	
F143	476827.882	165057.352	476827.882	165057.352	Required	
F44	476862.036	165072.405	476862.036	165072.405	Required	
F45	476891.057	165064.506	476891.057	165064.506	Required	
F45	476890.503	165073.974	476890.503	165073.974	Required	
F46	476950.736	165071.787	476950.736	165071.787	Required	
F145	476949.152	165076.820	476949.152	165076.820	Required	
F53	476911.644	165149.773	476911.644	165149.773	Required	
F54	476898.066	165148.889	476898.066	165148.889	Required	
F501	476880.794	165173.925	476880.794	165173.925	Required	
F55	476885.900	165165.693	476885.900	165165.693	Required	

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Manhole Schedules for PRELIM-NET-01-REVG.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F57	476855.227	165147.832	476855.227	165147.832	Required	
F58	476812.904	165121.066	476812.904	165121.066	Required	
F59	476825.134	165115.569	476825.134	165115.569	Required	
F60	476861.695	165137.594	476861.695	165137.594	Required	
F61	476872.069	165121.201	476872.069	165121.201	Required	
F61a	476899.249	165122.032	476899.249	165122.032	Required	
F47	476947.732	165125.783	476947.732	165125.783	Required	
F48	476954.001	165133.661	476954.001	165133.661	Required	
F49	476964.941	165137.491	476964.941	165137.491	Required	
F62	477021.926	165225.194	477021.926	165225.194	Required	
F63	477008.994	165208.949	477008.994	165208.949	Required	
F64	476979.121	165194.009	476979.121	165194.009	Required	
F65	476983.640	165183.521	476983.640	165183.521	Required	
F66	476990.052	165168.327	476990.052	165168.327	Required	
F50	476990.358	165137.084	476990.358	165137.084	Required	
F51	477010.192	165137.161	477010.192	165137.161	Required	
F52	477028.223	165141.381	477028.223	165141.381	Required	

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Manhole Schedules for PRELIM-NET-01-REV.G.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F146	477044.777	165153.133	477044.777	165153.133	Required	
F147	477055.061	165169.904	477055.061	165169.904	Required	
F148	477057.379	165183.696	477057.379	165183.696	Required	
F72	477054.273	165259.645	477054.273	165259.645	Required	
F149	477056.914	165214.915	477056.914	165214.915	Required	
F150	477074.662	165217.321	477074.662	165217.321	Required	
F74	477101.125	165269.438	477101.125	165269.438	Required	
F151	477117.252	165231.976	477117.252	165231.976	Required	
F152	477130.759	165236.559	477130.759	165236.559	Required	
F153	477164.819	165248.784	477164.819	165248.784	Required	
F79	477141.399	165281.738	477141.399	165281.738	Required	
F81	477151.600	165286.555	477151.600	165286.555	Required	
F80	477162.934	165261.026	477162.934	165261.026	Required	
F154	477169.290	165253.506	477169.290	165253.506	Required	
F87	477183.739	165202.377	477183.739	165202.377	Required	
F88	477182.764	165227.564	477182.764	165227.564	Required	
F155	477180.944	165262.871	477180.944	165262.871	Required	

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Manhole Schedules for PRELIM-NET-01-REVG.FWS

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
F89	477247.660	165263.922	477247.660	165263.922	Required	
F90	477217.919	165280.335	477217.919	165280.335	Required	
F91	477192.099	165281.863	477192.099	165281.863	Required	
F92	477179.724	165296.065	477179.724	165296.065	Required	
F1301	477165.682	165327.634	477165.682	165327.634	Required	
F1401	477200.488	165413.780	477200.488	165413.780	Required	
F2401	477212.901	165455.217	477212.901	165455.217	Required	
F2502	477228.974	165535.310	477228.974	165535.310	Required	
F2501	477274.769	165576.068			No Entry	

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	o	150	F100	61.656	59.800	1.706	Open Manhole	1200
F1.001	o	150	F101	60.608	58.100	2.358	Open Manhole	1200
F1.002	o	150	F102	59.514	56.800	2.564	Open Manhole	1200
F2.000	o	150	F103	59.218	57.825	1.243	Open Manhole	1200
F1.003	o	150	F104	59.375	56.400	2.825	Open Manhole	1200
F1.004	o	150	F105	58.991	55.988	2.853	Open Manhole	1200
F3.000	o	150	F106	59.893	58.500	1.243	Open Manhole	1200
F3.001	o	150	F107	58.623	57.250	1.223	Open Manhole	1200
F3.002	o	150	F108	58.024	56.620	1.254	Open Manhole	1200
F3.003	o	150	F109	57.950	55.920	1.880	Open Manhole	1200
F4.000	o	150	F110	60.118	58.500	1.468	Open Manhole	1200
F5.000	o	150	F111	59.910	58.500	1.260	Open Manhole	1200
F5.001	o	150	F112	59.736	58.375	1.211	Open Manhole	1200
F5.002	o	150	F113	59.375	57.975	1.250	Open Manhole	1200
F4.001	o	150	F114	59.331	57.865	1.316	Open Manhole	1200
F6.000	o	150	F115	59.368	58.000	1.218	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.000	33.471	19.7	F101	60.608	58.100	2.358	Open Manhole	1200
F1.001	31.976	24.6	F102	59.514	56.800	2.564	Open Manhole	1200
F1.002	10.738	26.8	F104	59.375	56.400	2.825	Open Manhole	1200
F2.000	15.959	12.0	F104	59.375	56.500	2.725	Open Manhole	1200
F1.003	28.424	69.0	F105	58.991	55.988	2.853	Open Manhole	1200
F1.004	69.954	123.1	F121	58.149	55.420	2.579	Open Manhole	1200
F3.000	36.315	29.1	F107	58.623	57.250	1.223	Open Manhole	1200
F3.001	22.449	35.6	F108	58.024	56.620	1.254	Open Manhole	1200
F3.002	23.360	33.4	F109	57.950	55.920	1.880	Open Manhole	1200
F3.003	12.818	25.6	F121	58.149	55.420	2.579	Open Manhole	1200
F4.000	52.732	87.9	F114	59.331	57.900	1.281	Open Manhole	1200
F5.000	18.333	146.7	F112	59.736	58.375	1.211	Open Manhole	1200
F5.001	36.018	90.0	F113	59.375	57.975	1.250	Open Manhole	1200
F5.002	15.490	140.8	F114	59.331	57.865	1.316	Open Manhole	1200
F4.001	43.770	73.0	F116	58.837	57.265	1.422	Open Manhole	1200
F6.000	52.813	75.4	F116	58.837	57.300	1.387	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F4.002	o	150	F116	58.837	57.265	1.422	Open Manhole	1200
F4.003	o	150	F117	58.739	57.135	1.454	Open Manhole	1200
F4.004	o	150	F118	58.302	56.735	1.417	Open Manhole	1200
F4.005	o	150	F119	58.072	56.435	1.487	Open Manhole	1200
F4.006	o	150	F120	57.634	55.935	1.549	Open Manhole	1200
F1.005	o	225	F121	58.149	55.345	2.579	Open Manhole	1200
F1.006	o	225	F122	58.026	55.166	2.636	Open Manhole	1200
F1.007	o	225	F123	58.180	55.004	2.951	Open Manhole	1200
F1.008	o	225	F124	58.202	54.872	3.105	Open Manhole	1200
F7.000	o	150	F125	58.630	55.850	2.630	Open Manhole	1200
F7.001	o	150	F126	58.213	55.300	2.763	Open Manhole	1200
F1.009	o	225	F127	58.077	54.773	3.079	Open Manhole	1200
F8.000	o	150	F128	58.945	57.500	1.295	Open Manhole	1200
F8.001	o	150	F129	56.851	54.800	1.901	Open Manhole	1200
F8.002	o	150	F130	57.098	54.700	2.248	Open Manhole	1200
F1.010	o	225	F131	57.655	54.238	3.192	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F4.002	9.750	75.0	F117	58.739	57.135	1.454	Open Manhole	1200
F4.003	21.509	53.8	F118	58.302	56.735	1.417	Open Manhole	1200
F4.004	28.659	95.5	F119	58.072	56.435	1.487	Open Manhole	1200
F4.005	46.476	93.0	F120	57.634	55.935	1.549	Open Manhole	1200
F4.006	6.591	13.2	F121	58.149	55.435	2.564	Open Manhole	1200
F1.005	24.181	135.1	F122	58.026	55.166	2.636	Open Manhole	1200
F1.006	21.894	135.1	F123	58.180	55.004	2.951	Open Manhole	1200
F1.007	17.772	135.0	F124	58.202	54.872	3.105	Open Manhole	1200
F1.008	13.393	135.0	F127	58.077	54.773	3.079	Open Manhole	1200
F7.000	38.002	69.1	F126	58.213	55.300	2.763	Open Manhole	1200
F7.001	31.052	69.0	F127	58.077	54.850	3.077	Open Manhole	1200
F1.009	42.388	84.8	F131	57.655	54.273	3.157	Open Manhole	1200
F8.000	52.455	19.4	F129	56.851	54.800	1.901	Open Manhole	1200
F8.001	27.624	276.2	F130	57.098	54.700	2.248	Open Manhole	1200
F8.002	24.099	62.3	F131	57.655	54.313	3.192	Open Manhole	1200
F1.010	15.824	233.0	F133	57.499	54.170	3.104	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F9.000	o	150	F132	57.932	55.050	2.732	Open Manhole	1200
F1.011	o	225	F133	57.499	54.170	3.104	Open Manhole	1200
F1.012	o	225	F134	57.263	54.017	3.021	Open Manhole	1200
F1.013	o	225	F135	56.635	53.597	2.813	Open Manhole	1200
F1.014	o	225	F136	56.166	53.135	2.806	Open Manhole	1200
F10.000	o	150	F137	58.302	56.500	1.652	Open Manhole	1200
F10.001	o	150	F138	57.831	55.874	1.807	Open Manhole	1200
F11.000	o	150	F139	57.737	56.200	1.387	Open Manhole	1200
F10.002	o	150	F140	57.260	55.159	1.951	Open Manhole	1200
F10.003	o	150	F141	56.828	54.638	2.040	Open Manhole	1200
F1.015	o	225	F143	56.448	52.890	3.333	Open Manhole	1200
F1.016	o	225	F44	56.738	52.703	3.810	Open Manhole	1200
F12.000	o	150	F45	55.600	52.660	2.790	Open Manhole	1200
F1.017	o	225	F45	56.446	52.460	3.761	Open Manhole	1200
F13.000	o	225	F46	55.690	52.470	2.995	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F9.000	61.927	77.6	F133	57.499	54.252	3.097	Open Manhole	1200
F1.011	23.009	150.4	F134	57.263	54.017	3.021	Open Manhole	1200
F1.012	63.109	150.3	F135	56.635	53.597	2.813	Open Manhole	1200
F1.013	69.866	151.2	F136	56.166	53.135	2.806	Open Manhole	1200
F1.014	47.805	195.1	F143	56.448	52.890	3.333	Open Manhole	1200
F10.000	48.569	77.6	F138	57.831	55.874	1.807	Open Manhole	1200
F10.001	55.488	77.6	F140	57.260	55.159	1.951	Open Manhole	1200
F11.000	48.385	46.5	F140	57.260	55.160	1.950	Open Manhole	1200
F10.002	40.390	77.5	F141	56.828	54.638	2.040	Open Manhole	1200
F10.003	32.624	65.0	F143	56.448	54.136	2.162	Open Manhole	1200
F1.015	37.324	199.6	F44	56.738	52.703	3.810	Open Manhole	1200
F1.016	28.510	199.4	F45	56.446	52.560	3.661	Open Manhole	1200
F12.000	9.484	75.9	F45	56.446	52.535	3.761	Open Manhole	1200
F1.017	58.718	195.1	F145	55.467	52.159	3.083	Open Manhole	1200
F13.000	5.276	22.9	F145	55.467	52.240	3.002	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.018	o	300	F145	55.467	52.084	3.083	Open Manhole	1200
F14.000	o	150	F53	54.953	53.603	1.200	Open Manhole	1200
F14.001	o	150	F54	55.143	53.498	1.495	Open Manhole	1200
F15.000	o	150	F501	55.800	53.483	2.167	Open Manhole	1200
F14.002	o	150	F55	54.875	53.338	1.387	Open Manhole	1200
F14.003	o	150	F57	55.567	53.065	2.352	Open Manhole	1200
F16.000	o	150	F58	55.861	54.295	1.416	Open Manhole	1200
F16.001	o	150	F59	55.884	54.046	1.688	Open Manhole	1200
F14.004	o	150	F60	55.662	52.943	2.569	Open Manhole	1200
F14.005	o	150	F61	55.649	52.803	2.696	Open Manhole	1200
F14.006	o	150	F61a	55.395	52.594	2.651	Open Manhole	1200
F1.019	o	300	F47	55.018	51.867	2.851	Open Manhole	1200
F1.020	o	300	F48	54.950	51.821	2.829	Open Manhole	1200
F1.021	o	300	F49	54.998	51.769	2.929	Open Manhole	1200
F17.000	o	150	F62	54.417	53.051	1.216	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F1.018	48.984	225.7	F47	55.018	51.867	2.851	Open Manhole	1200
F14.000	13.606	129.6	F54	55.143	53.498	1.495	Open Manhole	1200
F14.001	20.746	129.7	F55	54.875	53.338	1.387	Open Manhole	1200
F15.000	9.686	77.5	F55	54.875	53.358	1.367	Open Manhole	1200
F14.002	35.494	130.0	F57	55.567	53.065	2.352	Open Manhole	1200
F14.003	12.110	99.3	F60	55.662	52.943	2.569	Open Manhole	1200
F16.000	13.408	53.8	F59	55.884	54.046	1.688	Open Manhole	1200
F16.001	42.683	130.5	F60	55.662	53.719	1.793	Open Manhole	1200
F14.004	19.399	138.6	F61	55.649	52.803	2.696	Open Manhole	1200
F14.005	27.193	130.1	F61a	55.395	52.594	2.651	Open Manhole	1200
F14.006	48.628	84.3	F47	55.018	52.017	2.851	Open Manhole	1200
F1.019	10.068	218.9	F48	54.950	51.821	2.829	Open Manhole	1200
F1.020	11.591	222.9	F49	54.998	51.769	2.929	Open Manhole	1200
F1.021	25.420	221.0	F50	55.168	51.654	3.214	Open Manhole	1200
F17.000	20.764	100.0	F63	54.264	52.843	1.271	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F17.001	o	150	F63	54.264	52.843	1.271	Open Manhole	1200
F17.002	o	150	F64	54.487	52.509	1.828	Open Manhole	1200
F17.003	o	150	F65	54.674	52.395	2.129	Open Manhole	1200
F17.004	o	150	F66	54.879	52.230	2.499	Open Manhole	1200
F1.022	o	300	F50	55.168	51.654	3.214	Open Manhole	1200
F1.023	o	300	F51	55.072	51.564	3.208	Open Manhole	1200
F1.024	o	300	F52	54.864	51.477	3.087	Open Manhole	1200
F1.025	o	300	F146	54.621	51.388	2.933	Open Manhole	1200
F1.026	o	300	F147	54.378	51.294	2.784	Open Manhole	1200
F1.027	o	300	F148	54.314	51.231	2.783	Open Manhole	1200
F18.000	o	100	F72	54.577	53.200	1.277	Open Manhole	1200
F1.028	o	300	F149	54.549	51.088	3.161	Open Manhole	1200
F1.029	o	300	F150	54.364	51.010	3.054	Open Manhole	1200
F19.000	o	100	F74	53.198	51.842	1.256	Open Manhole	1200
F1.030	o	300	F151	53.932	50.805	2.827	Open Manhole	1200
F1.031	o	300	F152	53.793	50.740	2.753	Open Manhole	1200
F1.032	o	300	F153	53.422	50.626	2.496	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F17.001	33.400	100.0	F64	54.487	52.509	1.828	Open Manhole	1200
F17.002	11.421	100.2	F65	54.674	52.395	2.129	Open Manhole	1200
F17.003	16.491	99.9	F66	54.879	52.230	2.499	Open Manhole	1200
F17.004	31.245	100.1	F50	55.168	51.918	3.100	Open Manhole	1200
F1.022	19.834	220.4	F51	55.072	51.564	3.208	Open Manhole	1200
F1.023	18.518	212.9	F52	54.864	51.477	3.087	Open Manhole	1200
F1.024	20.301	228.1	F146	54.621	51.388	2.933	Open Manhole	1200
F1.025	19.672	209.3	F147	54.378	51.294	2.784	Open Manhole	1200
F1.026	13.986	222.0	F148	54.314	51.231	2.783	Open Manhole	1200
F1.027	31.223	218.3	F149	54.549	51.088	3.161	Open Manhole	1200
F18.000	44.808	64.0	F149	54.549	52.500	1.949	Open Manhole	1200
F1.028	17.910	229.6	F150	54.364	51.010	3.054	Open Manhole	1200
F1.029	45.041	219.7	F151	53.932	50.805	2.827	Open Manhole	1200
F19.000	40.786	48.7	F151	53.932	51.005	2.827	Open Manhole	1200
F1.030	14.264	219.4	F152	53.793	50.740	2.753	Open Manhole	1200
F1.031	36.187	317.4	F153	53.422	50.626	2.496	Open Manhole	1200
F1.032	6.503	75.6	F154	53.379	50.540	2.539	Open Manhole	1200

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PIPELINE SCHEDULES for PRELIM-NET-01-REVG.FWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F20.000	o	100	F79	52.894	51.342	1.452	Open Manhole	1200
F20.001	o	100	F81	52.704	51.042	1.562	Open Manhole	1200
F20.002	o	100	F80	53.430	50.693	2.637	Open Manhole	1200
F1.033	o	300	F154	53.379	50.357	2.722	Open Manhole	1200
F21.000	o	225	F87	52.353	50.360	1.768	Open Manhole	1200
F21.001	o	225	F88	52.263	50.270	1.768	Open Manhole	1200
F1.034	o	225	F155	51.864	50.180	1.459	Open Manhole	1200
F22.000	o	100	F89	52.920	51.620	1.200	Open Manhole	1200
F22.001	o	100	F90	52.771	51.197	1.474	Open Manhole	1200
F22.002	o	100	F91	53.007	50.875	2.032	Open Manhole	1200
F1.035	o	225	F92	51.660	50.020	1.415	Open Manhole	1200
F1.036	o	225	F1301	52.262	49.870	2.167	Open Manhole	1200
F1.037	o	225	F1401	52.000	49.530	2.245	Open Manhole	1200
F1.038	o	225	F2401	51.340	49.380	1.735	Open Manhole	1200
F1.039	o	225	F2502	51.240	49.200	1.815	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
F20.000	11.281	80.0	F81	52.704	51.201	1.403	Open Manhole	1200
F20.001	27.932	80.0	F80	53.430	50.693	2.637	Open Manhole	1200
F20.002	9.846	72.4	F154	53.379	50.557	2.722	Open Manhole	1200
F1.033	14.950	233.6	F155	51.864	50.293	1.271	Open Manhole	1200
F21.000	25.205	280.1	F88	52.263	50.270	1.768	Open Manhole	1200
F21.001	35.354	392.8	F155	51.864	50.180	1.459	Open Manhole	1200
F1.034	33.216	207.6	F92	51.660	50.020	1.415	Open Manhole	1200
F22.000	33.969	80.2	F90	52.771	51.197	1.474	Open Manhole	1200
F22.001	25.865	80.3	F91	53.007	50.875	2.032	Open Manhole	1200
F22.002	18.837	80.2	F92	51.660	50.640	0.920	Open Manhole	1200
F1.035	34.552	230.3	F1301	52.262	49.870	2.167	Open Manhole	1200
F1.036	92.912	273.3	F1401	52.000	49.530	2.245	Open Manhole	1200
F1.037	43.256	288.4	F2401	51.340	49.380	1.735	Open Manhole	1200
F1.038	81.690	453.8	F2502	51.240	49.200	1.815	Open Manhole	1200
F1.039	61.305	306.5	F2501	50.500	49.000	1.275	Open Manhole	1050

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Midpoint Alencon Link Basingstoke, RG21 7PP	Arborfield - District Centre RMA - FWS	
Date 21/03/2023 12:30 File PRELIM-NET 01-REV K.MDX	Designed by DN Checked by	
Innovyze	Network 2020.1	

Free Flowing Outfall Details for PRELIM-NET-01-REVG.FWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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F1.039	F2501	50.500	49.000	49.040	1050	0
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Simulation Criteria for PRELIM-NET-01-REVG.FWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	0	Number of Storage Structures	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	0	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	0.000	Storm Duration (mins)	30
Ratio R	0.000		