SURFACE WATER AND FOUL WATER DRAINAGE SCHEME WITH AN ASSESSMENT OF FLOOD RISK

for

Mr and Mrs RAINFORD

PROPOSED HOLIDAY COTTAGES

at

LOWER MOSS FARM

LOWER LANE, LONGRIDGE, PR3 2YH

JANUARY 2026

REFORD

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CONTENTS

1. INTRODUCTION

1.1 This surface water and foul water drainage scheme with an assessment of flood risk has been produced on behalf of Mr and Mrs Rainford in support of a regularisation application for the construction of three holiday cottages, including associated parking and access, landscaping and associated works at Moss Farm Lodge, Longridge. A location plan is included within Appendix A.

1.2 This drainage scheme describes the existing site conditions and proposed development. It assesses the potential impact of proposals on existing sewers and includes a proposed scheme for the provision of new drainage to serve the proposed development.

2. BASE INFORMATION

Existing site

2.1 The proposal relates to land that forms part of Moss Farm, Lower Lane, Longridge, PR3 2YH and the site where it is proposed to site the holiday cottages is of a size approx. 0.15ha.

2.2 The site is located to the south of Longridge and is accessed via a track which runs south from Lower Lane.

2.3 The site is a brownfield site comprising a hardstanding area and small buildings.

Topographical survey

2.4 A topographical survey has been carried out for the site.

2.5 The site has a general fall to the south.

Site geology

2.6 The online Soilscapes viewer has identified the geology of this parcel of land as *slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils with impeded drainage*.

2.7 Based upon the ground conditions identified, infiltration is unlikely to provide a viable drainage solution for surface water runoff generated by the site.

Understanding of existing drainage local to the site

2.8 A watercourse lies along the development site's western boundary. The watercourse flows to the south to discharge into the Tun Brook and ultimately the River Ribble.

2.9 Sewer records have been obtained from United Utilities and are included within Appendix B. The sewer records show a 225mm diameter public foul sewer lying within the northern verge of Lower Road. The sewer serves the properties that lie along Lower Road.

2.10 A private drainage system exists on the site. Surface water is discharged into the watercourse that lies along the development site's western boundary. Foul water discharges into the existing foul water drainage system to an onsite pumping station that pumps up to the public sewer that lies within Lower Lane.

Proposed development

2.11 It is proposed that the development will comprise the construction of three holiday cottages, including associated parking and access, landscaping and associated works.

3. PROPOSED DRAINAGE SCHEME

Surface water drainage

3.1 In accordance with the National Standards for Sustainable Drainage, the drainage scheme should incorporate the use of Sustainable Drainage (SuDS) where possible. The approach promotes the use infiltration features in the first instance. If drainage cannot be achieved solely through infiltration due to site conditions or contamination risks, the preferred options are (in order of preference):

(i) a controlled discharge to a local waterbody or watercourse, or

(ii) a controlled discharge into the public sewer network (depending on availability and capacity).

3.2 The rate and volume of discharge should strive to provide betterment and be restricted to the pre-development values as far as practicable.

3.3 Based upon the ground conditions identified, infiltration is unlikely to provide a viable drainage solution for surface water runoff generated by the site.

3.4 A watercourse lies along the development site's western boundary. The watercourse flows to the south to discharge into the Tun Brook and ultimately the River Ribble.

3.5 The area of buildings roofs at the completion of the development has been measured as 170m^2.

3.6 New surface water drainage will be installed to collect water from the new buildings roofs and be attenuated to 2.0 l/s prior to discharging into the watercourse that flows along the development site's western boundary.

3.7 It is intended that the informal internal access and footpaths will be cambered allowing surface water to runoff and naturally drain at their edges into a stone filter drain and the soil upper strata where it will be stored and will be either taken up by plants or evaporated.

3.8 A surface water drainage design has been carried out for the proposed site development for all events up to the 100 year critical rain storm plus 50% on stored volumes. The additional 50% is to allow for climate change and has been included in the surface water volume. Attenuation is provided by the inclusion of a surface pond. The surface water drainage design is included within Appendix C.

Foul water drainage

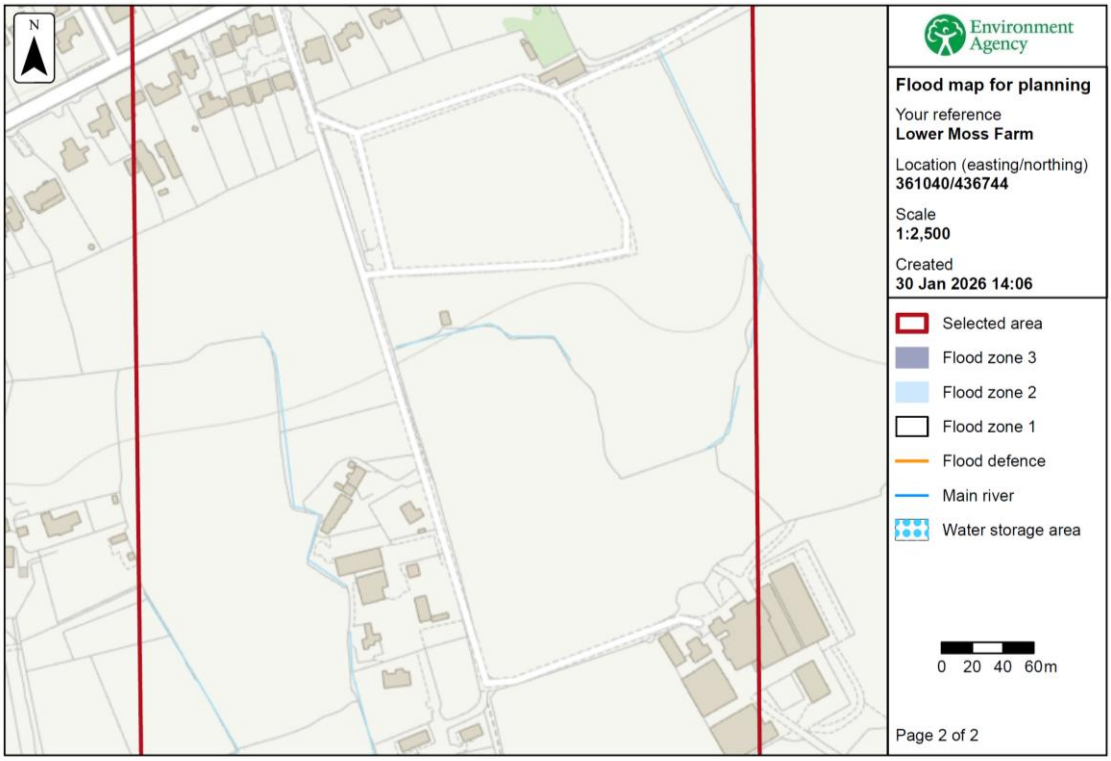
3.9 United Utilities sewer records show a 225mm diameter public foul sewer lying within the northern verge of Lower Road.

3.10 Foul water from the existing buildings within the site drain via the existing onsite foul drainage system to an onsite pumping station that pumps up to the public sewer that lies within Lower Lane.

3.11 It is intended that foul water from the proposed holiday cottages will drain to the onsite pumping station and the public sewer within Lower Lane.

4. ASSESSMENT OF FLOOD RISK

4.1 The site is identified as lying within Flood Zone 1, the lowest risk, which is land assessed as having a less than 0.1% of river or sea flooding. An extract from the Environment Agency's flood map for planning is below.



4.2 The Long Term Flood Risk map on the GOV.uk website shows the site where the holiday cottages are to be located is at a very low yearly chance of surface water flooding both now and between 2040 and 2060. A very low yearly chance means that this area has a chance of flooding of less than 0.1% each year.

4.3 Part of the existing access road into the site from Lower Lane has a low yearly chance of flooding both now and between 2040 and 2060. The depth of water is identified as being less than 200mm. A low yearly chance means that this area has a chance of flooding of between 0.1% and 1% chance each year.

4.4 No work is planned for the existing access road from Lower Lane, which will continue to serve the existing site and the area of the site where it is intended to place the holiday cottages. Should surface water flooding occur on part of the existing access

road then the depth of water has been identified as being less than 200mm and it is considered that the access road will be able to be navigated.

4.5 There are no canals or artificial sources local to the development site.

4.6 The two Spade Mill reservoirs lie to the north of the site and the two Alston Reservoirs lie to the south of the site. The Environment Agency risk of flooding from reservoirs map identifies the site is not at risk either when river levels are normal or when there is also flooding from rivers. Reservoirs are inspected and maintained in accordance with the Reservoirs Act, with necessary works undertaken when needed to resolve defects.

4.7 There are no public sewers within the site.

4.8 Groundwater flooding is not considered to be a significant flood risk factor.

4.9 Surface water runoff from the development will be controlled prior to discharge from the developed site and attenuation provided. As such there will be no change to the flood risk upstream or downstream of this location.

4.10 It is therefore concluded that there are no issues relating to flood risk or drainage of the site that would prevent its development.

5. MANAGEMENT AND MAINTENANCE RESPONSIBILITIES AND SPECIFICATION

5.1 The maintenance responsibilities for the various drainage features of the scheme will lie with the site owner.

5.2 The table below lists the various drainage features utilised within the proposed drainage design, along with the maintenance regime that should be followed.

BUILDING DRAINAGE	
Regular maintenance	**Frequency**
Visually inspect gutters to ensure they are kept clear of leaves, debris etc. Lift covers of drainage to inspect chambers for debris and build-up of silts. Check drainage pipes are operating as expected.	Annually. No triggers other than maintenance to be taken on regular schedule.
Occasional tasks	**Frequency**
Remove leaves and debris from gutters. Remove debris from chambers to ensure outlets are kept clear of debris to ensure adequate drainage.	As required. Indicator of problem / trigger for maintenance when surcharging or flooding of drains occurs or gutters and chambers full of debris and leaves etc.
Remedial work	**Frequency**
Should drains be heavily blocked or damaged contact drainage maintenance company for unblocking / repair works.	As required. Indicator of problem / trigger for maintenance when drainage not functioning and unblocking pipes and chambers etc. not effective.
WATERCOURSE	
Regular maintenance	**Frequency**
Visually inspect watercourse to ensure it is kept reasonably clear of leaves and debris etc. at surface. Inspection of inlet and outlet structures.	Annually. No triggers other than maintenance to be taken on regular schedule.
Cutting of vegetation along length of open watercourse sections so that the watercourse doesn't become overgrown.	Frequency varies, vegetation will require cutting more often in summer / spring months than autumn / winter months. To be cut as required. No triggers other than maintenance to be taken on regular schedule.
Remedial work	**Frequency**
Maintenance of watercourse profile should scour or erosion or build-up of silt occur. Repair of inlets and outlets.	As required. Indicator of problem / trigger for maintenance when significant watercourse scour and erosion or build-up of silt has occurred.

POND	
Regular maintenance	**Frequency**
Cut grass, remove leaves and debris. Visually inspect pond to be clear of debris or contaminants and remove if present.	4 to 6 times annually.
Occasional tasks	**Frequency**
Clear rubbish and deposits from pond after heavy storms and check for damage. Control weed and algae.	As required.
Remedial work	**Frequency**
Should the pond have large deposits of silt and dead organic matter, remove only half at any one time. Remove encroaching vegetation.	Autumn.

6. SUMMARY AND CONCLUSIONS

6.1 This surface water and foul water drainage scheme with an assessment of flood risk has been produced on behalf of Mr and Mrs Rainford in support of a regularisation application for the construction of three holiday cottages, including associated parking and access, landscaping and associated works at Moss Farm Lodge, Longridge.

6.2 The nature of the geology of the site means that infiltration back into the ground is not feasible.

6.3 A watercourse lies along the development site's western boundary. The watercourse flows to the south to discharge into the Tun Brook and ultimately the River Ribble.

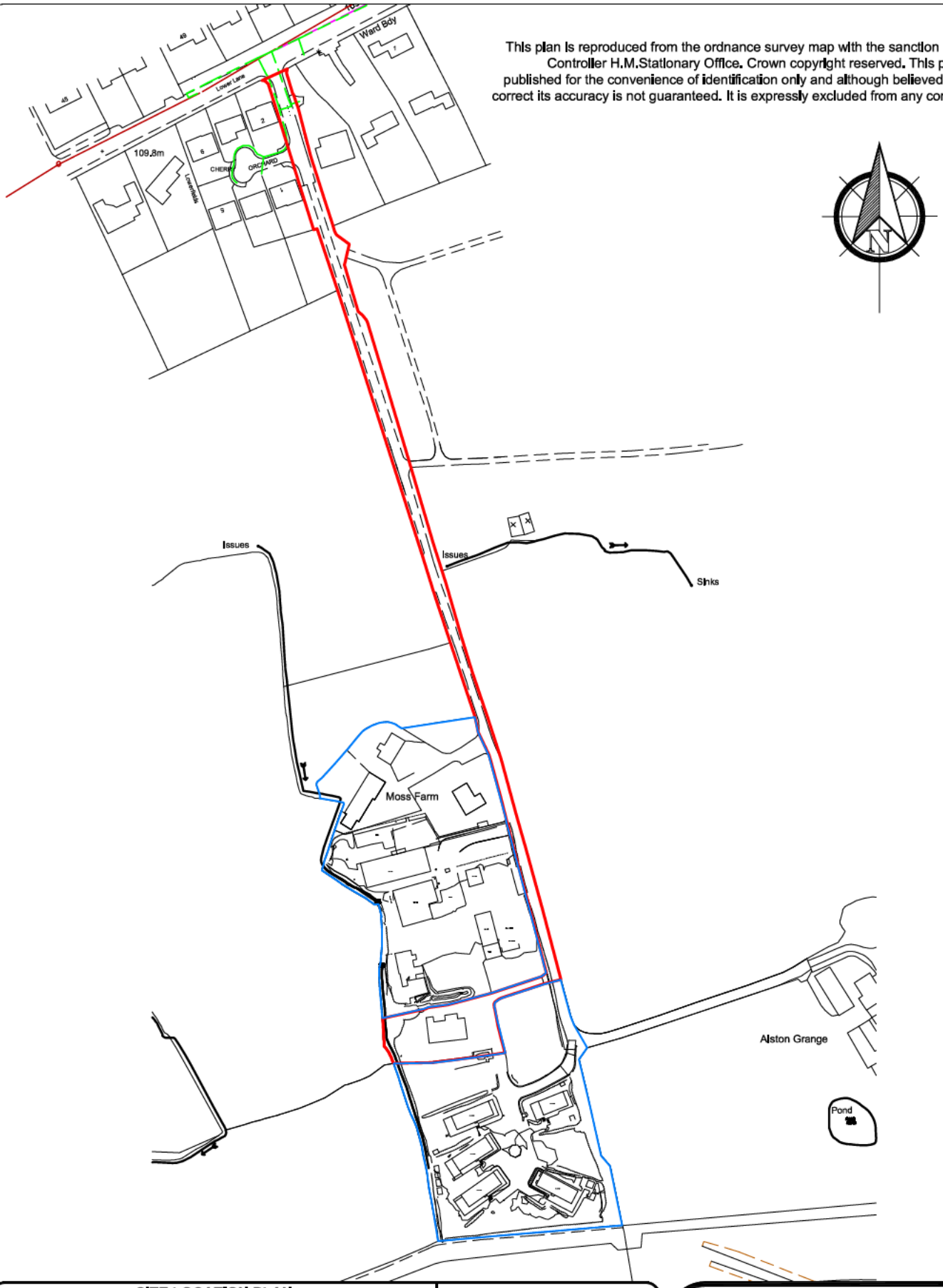
6.4 New surface water drainage will be installed to collect water from the new buildings roofs and attenuated to 2.0 l/s prior to discharging into the watercourse that flows along the development site's western boundary. Attenuation is provided by the inclusion of a surface pond.

6.5 Surface water runoff from the informal internal access and footpaths will be allowed to naturally drain at their edges into a stone filter drain and the soil upper strata where it will be stored and will be either taken up by plants or evaporated.

6.6 Foul water from the proposed holiday cottages will drain to the onsite pumping station and the public sewer within Lower Lane.

6.7 It is concluded that there are no issues relating to flood risk or drainage of the site that would prevent its development.

APPENDIX A



SITE LOCATION PLAN

Site: Lower Moss Farm
Lower Lane
Longridge

Client: Mr & Mrs Rainford
Drawn: DS
Date: 01.10.25
Scale: 1:2500 @ A4
Project No: RAI/12 Dwg 00
Amendments:

Notes:
All work is to be carried out to the latest current British standards Codes of Practice and recognised working practices. All work and materials should comply with Health and Safety legislation and to be approved by the Local Authority Planning / Building Control Officer.
All dimensions are in millimetres unless where explicitly shown otherwise. The contractor should check and clarify all dimensions as work proceeds and notify the design team of any discrepancies. Do not scale off the drawings, if in doubt ask.
Avalon Chartered Town Planning are not liable for work undertaken prior to Full Planning Consent and/or Building Regulations Approval

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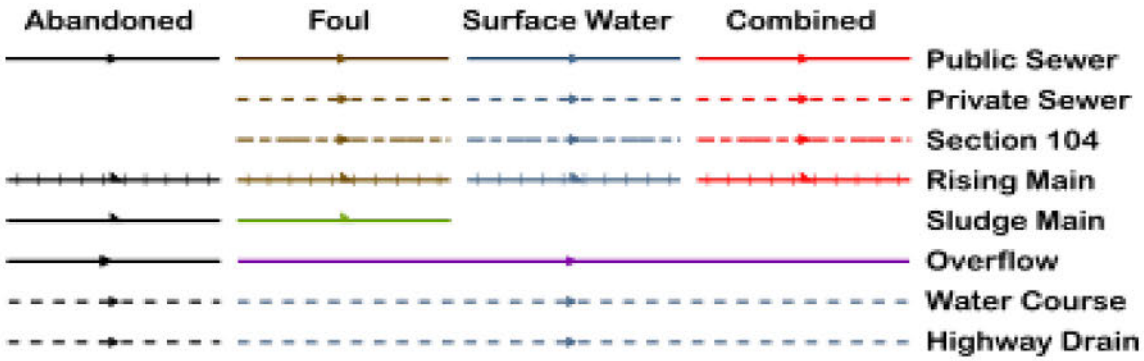
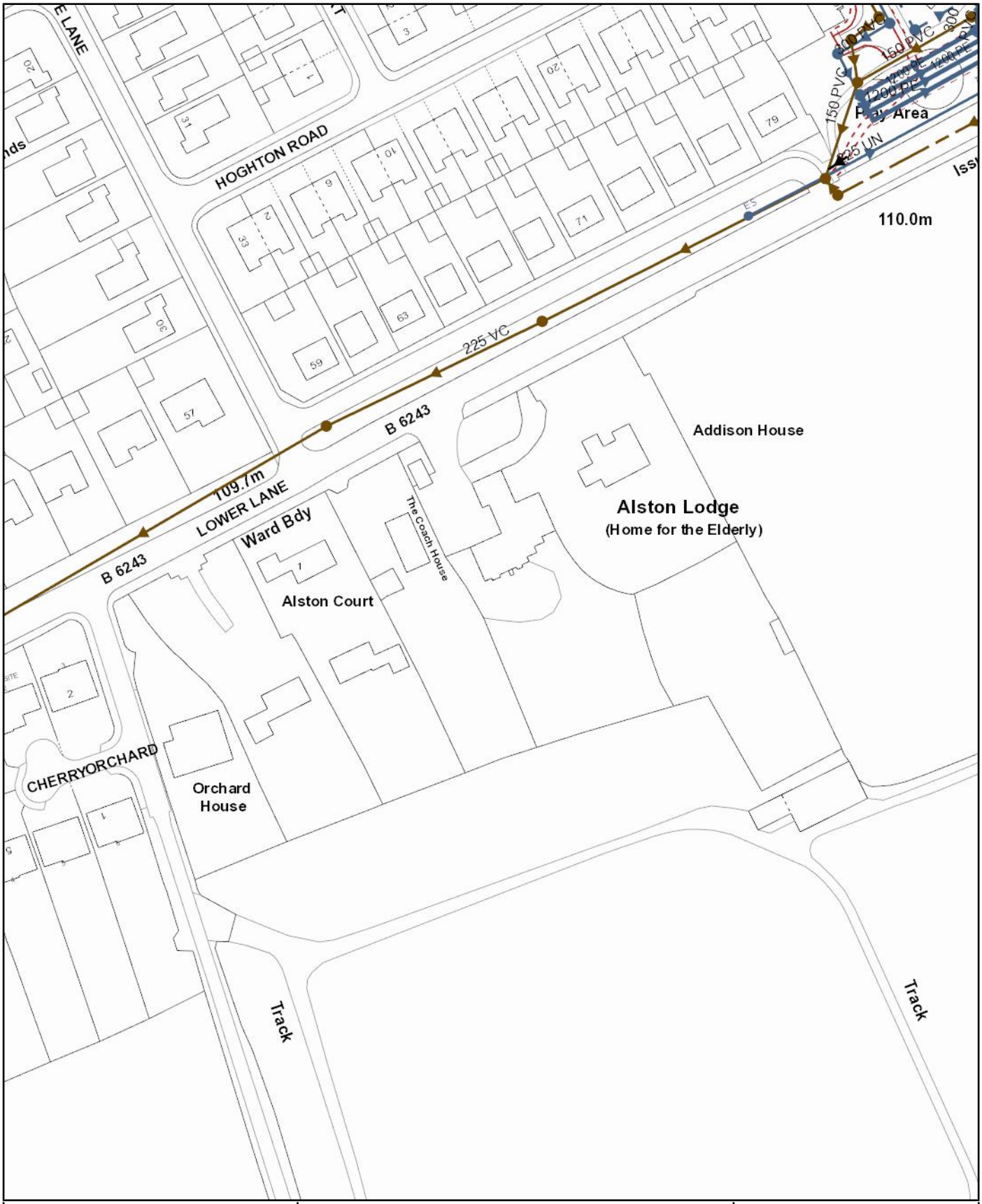
APPENDIX B

Wastewater Symbology



All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- Change of Characteristic



Scale:	1:1388	**SEWER RECORDS**	United Utilities helping life flow smoothly
Date:	28/10/2019		
Address or Site Reference:	alston lodge		
Printed by:	Property Searches		

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

APPENDIX C

PROPOSED SURFACE WATER DRAINAGE LAYOUT

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.900	Minimum Backdrop Height (m)	2.000
Ratio-R	0.290	Preferred Cover Depth (m)	0.500
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.005	5.00	95.100	100	0.600
2	0.004	5.00	95.100	450	0.900
3	0.004	5.00	95.100	100	0.600
4	0.004	5.00	95.100	450	1.100
pond			94.700	1200	0.770
5			94.600	1200	0.755

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	18.000	0.600	94.500	94.200	0.300	60.0	100	5.30	55.0
1.001	2	4	12.000	0.600	94.200	94.000	0.200	60.0	100	5.50	54.2
2.000	3	4	18.000	0.600	94.500	94.000	0.500	36.0	100	5.23	55.3
1.002	4	pond	4.000	0.600	94.000	93.930	0.070	57.1	100	5.57	54.0
1.003	pond	5	5.000	0.600	93.930	93.845	0.085	58.8	100	5.65	53.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.996	7.8	0.7	0.500	0.800	0.005	0.0	21	0.621
1.001	0.996	7.8	1.3	0.800	1.000	0.009	0.0	28	0.739
2.000	1.289	10.1	0.6	0.500	1.000	0.004	0.0	17	0.708
1.002	1.021	8.0	2.5	1.000	0.670	0.017	0.0	38	0.896
1.003	1.006	7.9	2.5	0.670	0.655	0.017	0.0	39	0.892

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Additional Storage (m³/ha)	20.0
Rainfall Events	Singular	Winter CV	0.840	Starting Level (m)	
FSR Region	England and Wales	Analysis Speed	Normal	Check Discharge Rate(s)	x
M5-60 (mm)	18.900	Skip Steady State	x	Check Discharge Volume	x
Ratio-R	0.290	Drain Down Time (mins)	240		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	45	0	0	100	50	0	0

Node pond Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	93.930	Product Number	CTL-SHE-0071-2000-0750-2000
Design Depth (m)	0.750	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	93.930
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	27

Depth (m)	Area (m²)	Inf Area (m²)
0.000	6.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.521	0.021	0.8	0.0037	0.0000	OK
15 minute winter	2	11	94.228	0.028	1.4	0.0070	0.0000	OK
15 minute summer	3	11	94.517	0.017	0.6	0.0023	0.0000	OK
15 minute winter	4	11	94.042	0.042	2.6	0.0097	0.0000	OK
30 minute winter	pond	23	94.028	0.098	2.1	0.7013	0.0000	OK
30 minute winter	5	23	93.873	0.028	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	0.8	0.514	0.097	0.0268	
15 minute winter	2	1.001	4	1.4	0.559	0.173	0.0295	
15 minute summer	3	2.000	4	0.6	0.325	0.059	0.0354	
15 minute winter	4	1.002	pond	2.6	0.963	0.325	0.0194	
30 minute winter	pond	1.003	5	1.3	0.729	0.171	0.0093	1.6

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.535	0.035	2.1	0.0062	0.0000	OK
15 minute winter	2	10	94.248	0.048	3.8	0.0120	0.0000	OK
15 minute winter	3	10	94.528	0.028	1.7	0.0039	0.0000	OK
30 minute winter	4	24	94.225	0.225	5.9	0.0523	0.0000	SURCHARGED
30 minute winter	pond	25	94.218	0.288	5.1	2.0540	0.0000	SURCHARGED
30 minute summer	5	24	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	2.1	0.668	0.265	0.0559	
15 minute winter	2	1.001	4	3.7	0.663	0.472	0.0695	
15 minute winter	3	2.000	4	1.7	0.385	0.165	0.0862	
30 minute winter	4	1.002	pond	5.1	0.942	0.638	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.533	0.033	1.9	0.0058	0.0000	OK
15 minute winter	2	10	94.245	0.045	3.4	0.0112	0.0000	OK
15 minute winter	3	10	94.526	0.026	1.5	0.0036	0.0000	OK
30 minute winter	4	24	94.183	0.183	5.1	0.0424	0.0000	SURCHARGED
30 minute winter	pond	25	94.176	0.246	4.5	1.7517	0.0000	SURCHARGED
30 minute winter	5	25	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.9	0.655	0.239	0.0515	
15 minute winter	2	1.001	4	3.3	0.651	0.421	0.0675	
15 minute winter	3	2.000	4	1.5	0.383	0.145	0.0845	
30 minute winter	4	1.002	pond	4.5	0.900	0.560	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.1

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.541	0.041	2.8	0.0072	0.0000	OK
60 minute winter	2	45	94.360	0.160	2.9	0.0397	0.0000	SURCHARGED
15 minute winter	3	10	94.532	0.032	2.3	0.0045	0.0000	OK
60 minute winter	4	45	94.355	0.355	5.5	0.0824	0.0000	SURCHARGED
60 minute winter	pond	46	94.349	0.419	4.8	2.9906	0.0000	SURCHARGED
30 minute summer	5	40	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	2.8	0.716	0.355	0.0944	
60 minute winter	2	1.001	4	2.9	0.611	0.370	0.0939	
15 minute winter	3	2.000	4	2.3	0.397	0.223	0.0900	
60 minute winter	4	1.002	pond	4.8	0.900	0.600	0.0313	
60 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	8.1

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.900	Minimum Backdrop Height (m)	2.000
Ratio-R	0.290	Preferred Cover Depth (m)	0.500
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.005	5.00	95.100	100	0.600
2	0.004	5.00	95.100	450	0.900
3	0.004	5.00	95.100	100	0.600
4	0.004	5.00	95.100	450	1.100
pond			94.700	1200	0.770
5			94.600	1200	0.755

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	18.000	0.600	94.500	94.200	0.300	60.0	100	5.30	55.0
1.001	2	4	12.000	0.600	94.200	94.000	0.200	60.0	100	5.50	54.2
2.000	3	4	18.000	0.600	94.500	94.000	0.500	36.0	100	5.23	55.3
1.002	4	pond	4.000	0.600	94.000	93.930	0.070	57.1	100	5.57	54.0
1.003	pond	5	5.000	0.600	93.930	93.845	0.085	58.8	100	5.65	53.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.996	7.8	0.7	0.500	0.800	0.005	0.0	21	0.621
1.001	0.996	7.8	1.3	0.800	1.000	0.009	0.0	28	0.739
2.000	1.289	10.1	0.6	0.500	1.000	0.004	0.0	17	0.708
1.002	1.021	8.0	2.5	1.000	0.670	0.017	0.0	38	0.896
1.003	1.006	7.9	2.5	0.670	0.655	0.017	0.0	39	0.892

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Additional Storage (m³/ha)	20.0
Rainfall Events	Singular	Winter CV	0.840	Starting Level (m)	
FSR Region	England and Wales	Analysis Speed	Normal	Check Discharge Rate(s)	x
M5-60 (mm)	18.900	Skip Steady State	x	Check Discharge Volume	x
Ratio-R	0.290	Drain Down Time (mins)	240		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	45	0	0	100	50	0	0

Node pond Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	93.930	Product Number	CTL-SHE-0071-2000-0750-2000
Design Depth (m)	0.750	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	93.930
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	27

Depth (m)	Area (m²)	Inf Area (m²)
0.000	6.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.521	0.021	0.8	0.0037	0.0000	OK
15 minute winter	2	11	94.228	0.028	1.4	0.0070	0.0000	OK
15 minute summer	3	11	94.517	0.017	0.6	0.0023	0.0000	OK
15 minute winter	4	11	94.042	0.042	2.6	0.0097	0.0000	OK
30 minute winter	pond	23	94.028	0.098	2.1	0.7013	0.0000	OK
30 minute winter	5	23	93.873	0.028	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	0.8	0.514	0.097	0.0268	
15 minute winter	2	1.001	4	1.4	0.559	0.173	0.0295	
15 minute summer	3	2.000	4	0.6	0.325	0.059	0.0354	
15 minute winter	4	1.002	pond	2.6	0.963	0.325	0.0194	
30 minute winter	pond	1.003	5	1.3	0.729	0.171	0.0093	1.6

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.535	0.035	2.1	0.0062	0.0000	OK
15 minute winter	2	10	94.248	0.048	3.8	0.0120	0.0000	OK
15 minute winter	3	10	94.528	0.028	1.7	0.0039	0.0000	OK
30 minute winter	4	24	94.225	0.225	5.9	0.0523	0.0000	SURCHARGED
30 minute winter	pond	25	94.218	0.288	5.1	2.0540	0.0000	SURCHARGED
30 minute summer	5	24	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	2.1	0.668	0.265	0.0559	
15 minute winter	2	1.001	4	3.7	0.663	0.472	0.0695	
15 minute winter	3	2.000	4	1.7	0.385	0.165	0.0862	
30 minute winter	4	1.002	pond	5.1	0.942	0.638	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.6

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.533	0.033	1.9	0.0058	0.0000	OK
15 minute winter	2	10	94.245	0.045	3.4	0.0112	0.0000	OK
15 minute winter	3	10	94.526	0.026	1.5	0.0036	0.0000	OK
30 minute winter	4	24	94.183	0.183	5.1	0.0424	0.0000	SURCHARGED
30 minute winter	pond	25	94.176	0.246	4.5	1.7517	0.0000	SURCHARGED
30 minute winter	5	25	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	1.9	0.655	0.239	0.0515	
15 minute winter	2	1.001	4	3.3	0.651	0.421	0.0675	
15 minute winter	3	2.000	4	1.5	0.383	0.145	0.0845	
30 minute winter	4	1.002	pond	4.5	0.900	0.560	0.0313	
30 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	4.1

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	94.541	0.041	2.8	0.0072	0.0000	OK
60 minute winter	2	45	94.360	0.160	2.9	0.0397	0.0000	SURCHARGED
15 minute winter	3	10	94.532	0.032	2.3	0.0045	0.0000	OK
60 minute winter	4	45	94.355	0.355	5.5	0.0824	0.0000	SURCHARGED
60 minute winter	pond	46	94.349	0.419	4.8	2.9906	0.0000	SURCHARGED
30 minute summer	5	40	93.879	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	2.8	0.716	0.355	0.0944	
60 minute winter	2	1.001	4	2.9	0.611	0.370	0.0939	
15 minute winter	3	2.000	4	2.3	0.397	0.223	0.0900	
60 minute winter	4	1.002	pond	4.8	0.900	0.600	0.0313	
60 minute winter	pond	1.003	5	2.0	0.808	0.253	0.0124	8.1