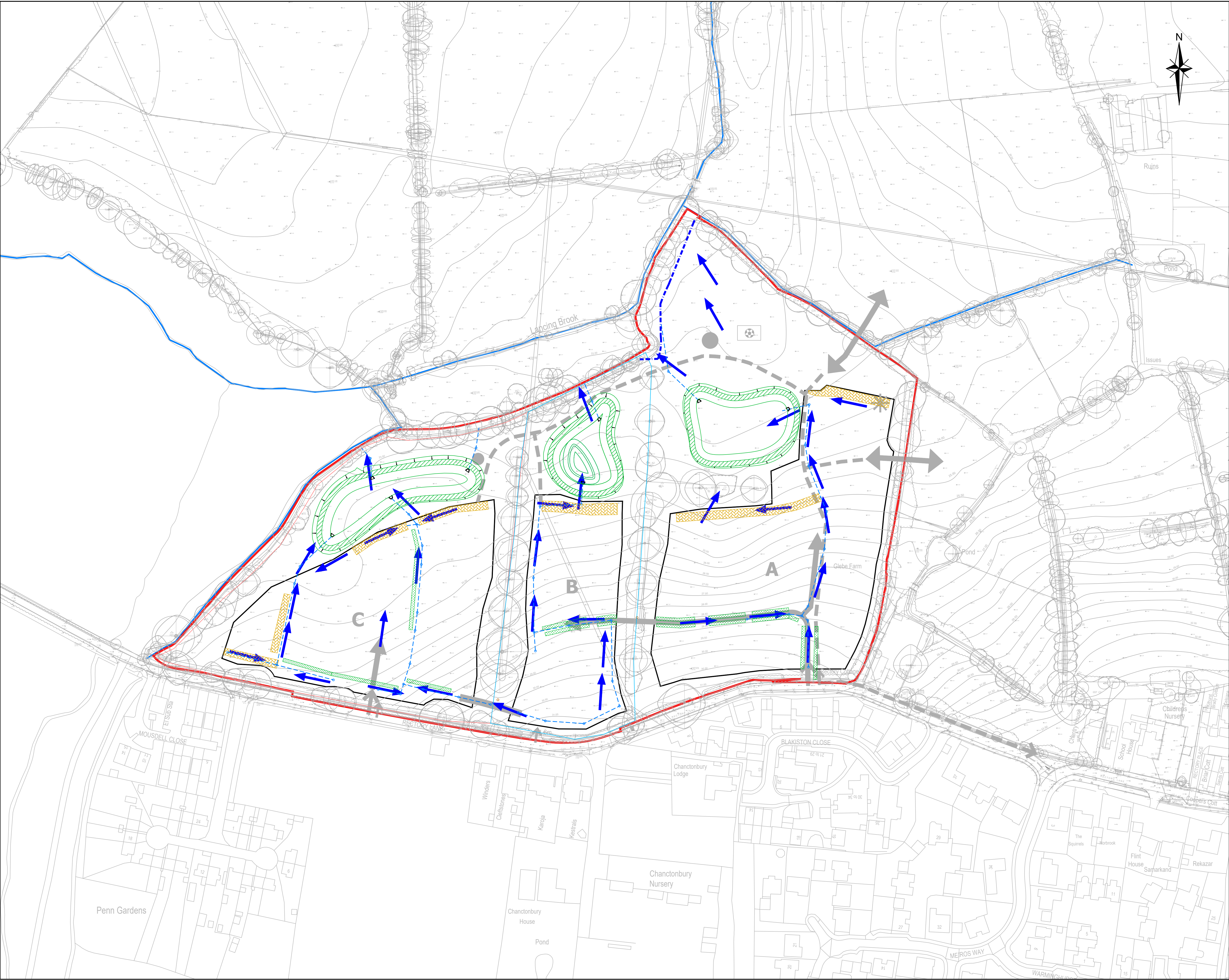




NOTES

1.

Do not scale from this drawing.

2.

This drawing is in metres unless stated otherwise.

3.

Topographical Survey has been provided by others. C&A accept no liability for inaccuracies.

4.

C&A Consulting Engineers Ltd cannot guarantee the authenticity or reliability of any data and/or records provided by third parties.

Key

Site Boundary

Exceedance Flow Direction (Post-Development)

Proposed Attenuation Basins

Proposed Rain Gardens

Proposed Permeable Paving on share and individual drives

Proposed Surface Water Network

Tree Root Protection Areas

Land Parcels

A Updated to suit new Site Boundary

MT

LB

LB

July 26

Rev

Amendments

Drm

Chk

App

Date

Charles & Associates

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01732 448120

Job Title

Ashington,
West Sussex

Drawing Title

Post Development Exceedance
Flow Route Strategy Plan

Client

Taylor Wimpey

Scale

1:1000@A1

Date

June 2026

Designed

MS

Drawn

MS

Checked

MT

Approved

LB

Job No

25-036

Drawing No

25-036-013

Rev

A

Appendix I Surface Water Causeway Flow Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	250.0		

Circular Link Type

Template	Freeform Carrier	Auto Increment (mm)	75
Shape	Circular	Follow Ground	x
Barrels	1		

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
2	0.790	5.00	25.000	1500	5.073	101.044	1.500	23.500
Catchment C			24.400		20.959	99.327	1.000	23.400
4			24.000	1500	39.584	99.603	1.030	22.970
Cathment B			24.050		19.526	91.126	1.000	23.050
8	0.467	5.00	24.700	1500	1.507	92.226	1.400	23.300
9			23.500	1200	34.321	90.976	1.350	22.150
1	1.022	5.00	23.500	1500	0.258	85.751	1.200	22.300
Catchment A			23.200		14.577	83.378	1.000	22.200
3			23.000	1500	34.071	83.228	0.870	22.130

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)
1.000	2	Catchment C	15.979	0.600	23.500	23.400	0.100	159.8	450	5.17
1.001	Catchment C	4	18.627	0.600	23.400	22.970	0.430	43.3	450	5.27
3.000	8	Cathment B	18.053	0.600	23.300	23.050	0.250	72.2	525	5.11
2.001	Cathment B	9	14.846	0.600	23.050	22.150	0.900	16.5	225	5.19

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	1.605	255.3	104.9	1.050	0.550	0.790	0.0	201	1.530
1.001	3.095	492.3	104.2	0.550	0.580	0.790	0.0	139	2.474
3.000	2.638	571.0	62.2	0.875	0.475	0.467	0.0	116	1.755
2.001	3.237	128.7	61.9	0.775	1.125	0.467	0.0	110	3.211

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)
2.000	1	Catchment A	14.514	0.600	22.300	22.200	0.100	145.1	600	5.12
2.001_1	Catchment A	3	19.495	0.600	22.200	22.130	0.070	278.5	600	5.34

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)
2.000	2.019	570.8	136.2	0.600	0.400	1.022	0.0	198	1.671
2.001_1	1.454	411.1	134.0	0.400	0.270	1.022	0.0	235	1.306

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	40	0	0
100	45	0	0

Node Catchment C Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.001	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0137-8200-0700-8200
Invert Level (m)	23.400	Min Outlet Diameter (m)	0.150
Design Depth (m)	0.700	Min Node Diameter (mm)	1200
Design Flow (l/s)	8.2		

Node Cathment B Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	23.050	Product Number	CTL-SHE-0109-4900-0700-4900
Design Depth (m)	0.700	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.9	Min Node Diameter (mm)	1200

Node Catchment A Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	2.001_1	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0154-1070-0700-1070
Invert Level (m)	22.200	Min Outlet Diameter (m)	0.225
Design Depth (m)	0.700	Min Node Diameter (mm)	1200
Design Flow (l/s)	10.7		

Node Catchment C Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	792

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	813.0	0.0	1.000	1830.0	0.0

Node Cathment B Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.050
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	504

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	730.0	0.0	1.000	1252.0	0.0

Node Catchment A Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	22.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	7425

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1345.0	0.0	1.000	1996.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.68%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	2	10	23.688	0.188	97.1	0.3330	0.0000	OK
720 minute summer	Catchment C	465	23.551	0.151	19.0	134.2433	0.0000	OK
720 minute summer	4	465	23.005	0.035	6.1	0.0000	0.0000	OK
720 minute summer	Cathment B	465	23.160	0.110	11.2	83.6626	0.0000	OK
15 minute summer	8	10	23.426	0.126	57.3	0.2231	0.0000	OK
720 minute summer	9	465	22.174	0.024	3.1	0.0000	0.0000	OK
10080 minute winter	1	7260	22.619	0.319	3.2	0.5640	0.0000	OK
10080 minute winter	Catchment A	7260	22.619	0.419	3.2	620.9623	0.0000	OK
15 minute summer	3	501	22.580	0.450	0.4	0.0000	0.0000	OK

US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2	1.000	Catchment C	96.7	3.477	0.379	0.5283	
Catchment C	1.001	4	6.1	1.072	0.012	0.1052	217.7
Cathment B	2.001	9	3.1	1.356	0.024	0.0339	127.9
8	3.000	Cathment B	57.1	3.309	0.100	0.3759	
1	2.000	Catchment A	3.2	0.491	0.006	2.6312	
Catchment A	2.001_1	3	6.6	0.425	0.016	4.0441	753.1

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	2	10	24.362	0.862	567.8	1.5228	0.0000	SURCHARGED
480 minute winter	Catchment C	464	23.927	0.527	63.2	569.3564	0.0000	SURCHARGED
60 minute winter	4	348	23.010	0.040	8.2	0.0000	0.0000	OK
480 minute winter	Cathment B	464	23.451	0.401	40.1	334.7840	0.0000	SURCHARGED
15 minute summer	8	10	23.598	0.298	335.3	0.5265	0.0000	OK
60 minute winter	9	212	22.180	0.030	4.9	0.0000	0.0000	OK
15 minute summer	1	10	22.860	0.560	734.5	0.9891	0.0000	OK
1440 minute winter	Catchment A	1050	22.755	0.555	32.8	846.7632	0.0000	OK
15 minute summer	3	501	22.580	0.450	9.9	0.0000	0.0000	OK

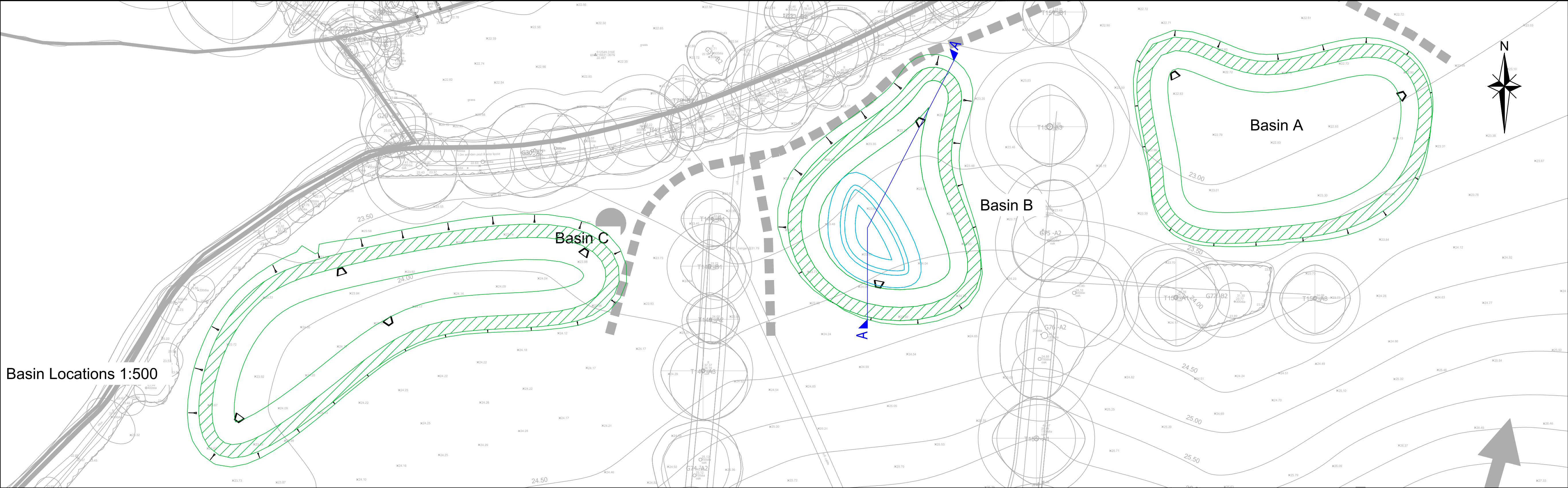
US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2	1.000	Catchment C	563.8	4.776	2.208	1.7991	
Catchment C	1.001	4	8.2	1.178	0.017	0.1295	723.5
Cathment B	2.001	9	4.9	1.557	0.038	0.0467	426.6
8	3.000	Cathment B	334.6	4.846	0.586	1.4217	
1	2.000	Catchment A	737.7	4.876	1.292	2.3343	
Catchment A	2.001_1	3	10.5	0.429	0.025	4.0443	1072.9

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.98%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	2	10	24.914	1.414	741.1	2.4982	0.0000	FLOOD RISK
480 minute winter	Catchment C	472	24.061	0.661	80.6	759.8800	0.0000	SURCHARGED
15 minute summer	4	135	23.010	0.040	8.2	0.0000	0.0000	OK
480 minute summer	Cathment B	480	23.571	0.521	84.6	451.3053	0.0000	SURCHARGED
15 minute summer	8	10	23.647	0.347	437.6	0.6133	0.0000	OK
30 minute winter	9	230	22.180	0.030	4.9	0.0000	0.0000	OK
30 minute summer	1	17	22.923	0.623	882.4	1.1016	0.0000	SURCHARGED
960 minute winter	Catchment A	810	22.883	0.683	59.1	1070.2060	0.0000	SURCHARGED
15 minute summer	3	501	22.580	0.450	10.6	0.0000	0.0000	OK

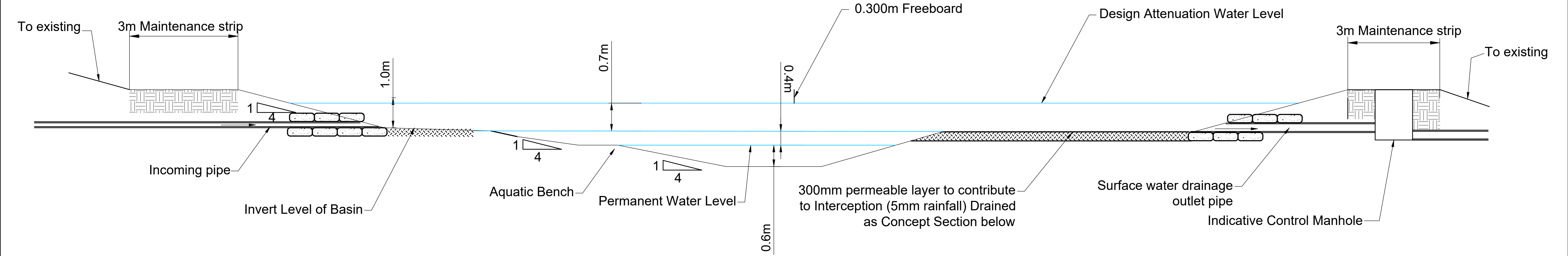
US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2	1.000	Catchment C	735.9	5.872	2.882	2.0829	
Catchment C	1.001	4	8.2	1.178	0.017	0.1295	923.4
Cathment B	2.001	9	4.9	1.557	0.038	0.0467	543.8
8	3.000	Cathment B	436.6	5.039	0.765	1.7854	
1	2.000	Catchment A	901.7	4.594	1.580	2.8177	
Catchment A	2.001_1	3	10.7	0.429	0.026	4.0444	1279.7

Appendix J Detention Basin Details

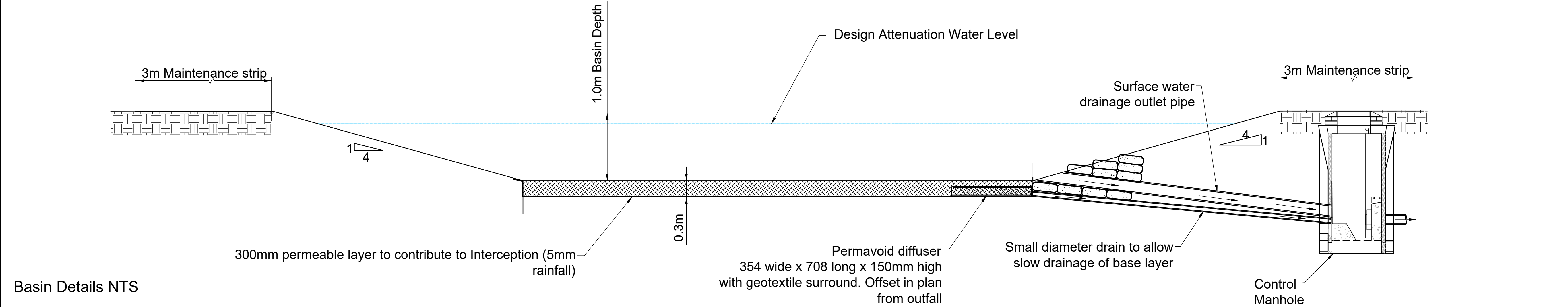


- NOTES
1. Do not scale from this drawing.
 2. This drawing is in metres unless stated otherwise.
 3. Topographical Survey has been provided by others. C&A accept no liability for inaccuracies.
 4. C&A Consulting Engineers Ltd cannot guarantee the authenticity or reliability of any data and/or records provided by third parties.
 5. For Surface Water Drainage Strategy see Drawing No. 25-036-005

DETENTION BASIN B CONCEPT
A-A

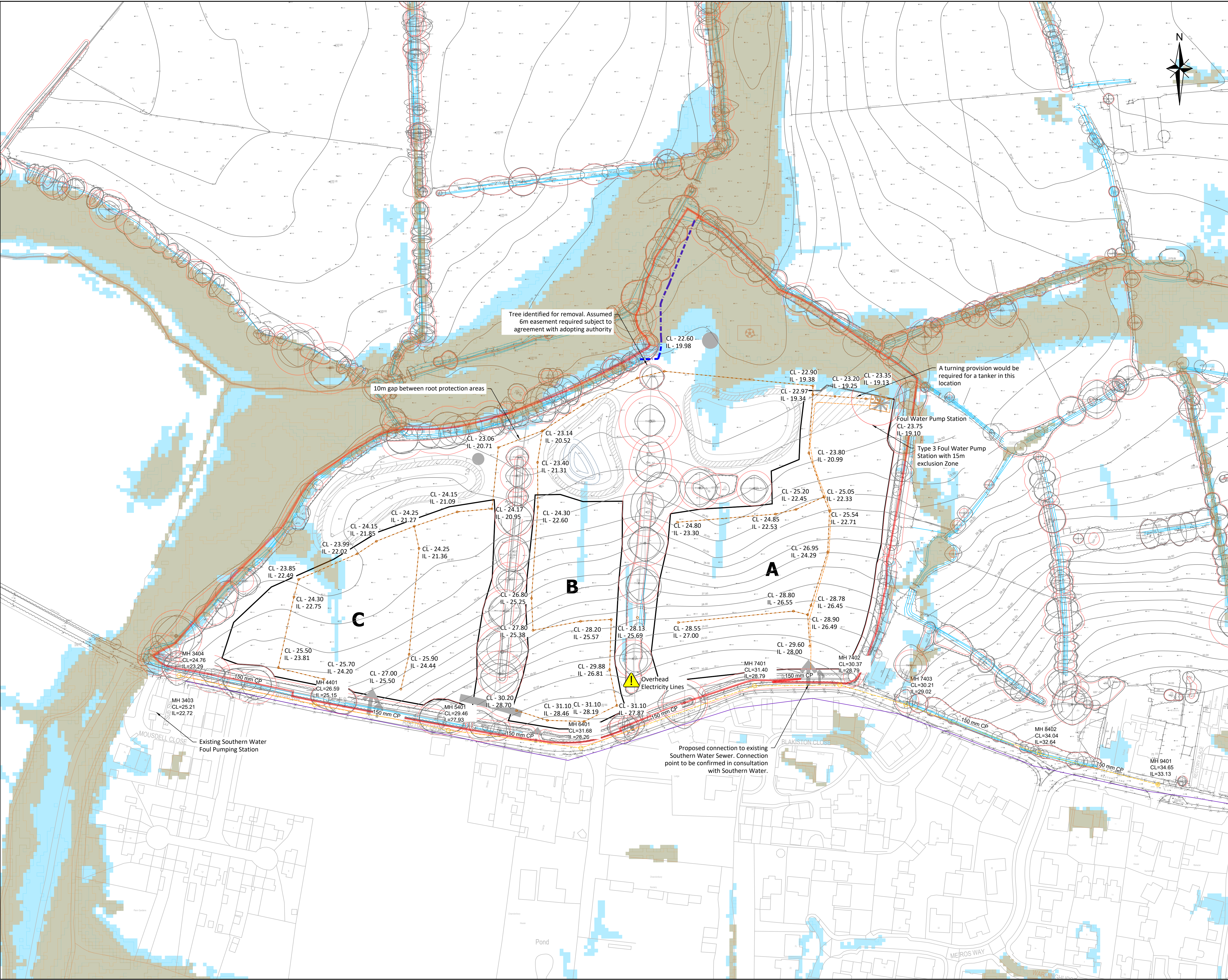


DETENTION BASIN A & C CONCEPT



rev	Amendments	Drm	Chk	App	Date
Charles & Associates Issued by Landmark House Station Road Hook Hampshire RG27 9HA 01256 638420 enquiries@c-a.uk.com www.c-a.uk.com Park House Park Farm East Malling Trust Estate Bradbourne Lane Aylesford Kent ME20 6NN 01732 448120 Job Title Ashington West Sussex Drawing Title Detention Basin Details Client Taylor Wimpey Scale As shown @ A1 Date June 2026 Designed MT Drawn MT Checked Approved Job No 25-036 Drawing No 25-036-016 Rev -					

Appendix K Foul Water Drainage Strategy



NOTES

1. Do not scale from this drawing.

2. This drawing is in metres unless stated otherwise.

3. Topographical Survey has been provided by others. C&A accept no liability for inaccuracies. C&A Consulting Engineers Ltd cannot guarantee the authenticity or reliability of any data and/or records provided by third parties.

4. A Type 3 Foul Water Pump Station has a 15m exclusion zone around it, shown as a red circle. This is a no build zone for habitable buildings due to noise and odor.

5. A Pre Planning Enquiry has been undertaken with Southern Water who have confirmed that there is not currently capacity in the existing foul water sewer in Rectory Lane draining to the Pumping Station in Mousdell Close. Therefore, off site reinforcement works will be required to provide capacity

6. Overhead electricity lines cross through Land Parcel B.

Key

Proposed Foul Water Sewer Network

Proposed Route of Foul Water Rising Main

Type 3 Foul Water Pump Station

Existing Southern Water Foul Water Sewer

Existing Overhead Electricity Lines

1 in 1000 year Climate Change Surface Water Flooding Extent

1 in 100 year Climate Change Surface Water Flooding Extent

C Updated to suit new Site Boundary

B Updated Site Layout

A Updated Site Layout

MT

LB

LB

July 26

MT

LB

LB

Jun 26

MT

LB

LB

Jun 26

Rev

Amendments

Drn

Chk

App

Date

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Job Title

Ashington,
West Sussex

Drawing Title

Foul Water
Drainage Strategy

Client

Taylor Wimpey

Scale

1:1000@A1

Date

March 2026

Designed

MB

Drawn

MB

Checked

MT

Approved

LB

Job No

25-036

Drawing No

25-036-004

Rev

C

Appendix L Capacity Check Letter from Southern Water



Mitra Sharafbayani
Charles & Associates Consulting Engineers Ltd
Landmark House, Station Road
Hook
Hampshire
RG27 9HA

Your ref
24830

Our ref
DSA000052281

Date
23rd of March 2026

Contact
Tel 0330 303 0119

Dear Mrs Sharafbayani,
Level 1 Capacity Check Enquiry: Ashington, West Sussex.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

The enquiry has been assessed to determine the capacity available for **1.30 l/s** at manhole reference **TQ12167402 (512762, 116462)**.

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of **1.30 l/s** for the above development at manhole reference **TQ12167402 (512762, 116462)**. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

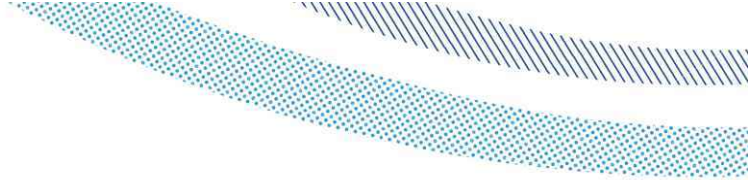
Please note, the assessment that has been undertaken has used an assumed pump rate of **4 l/s**. This has been calculated using Southern Water's modelling specifications.

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the "New Connections Services Charging Arrangements". We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: [Connecting Charging Arrangements - Southern Water](#)

Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX
[southernwater.co.uk](https://www.southernwater.co.uk)

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670



Alternatively, New Appointees and Variations (NAVs), also known as 'inset' companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter. **Any revisions in flow rate or alternative point of connection will require a new Pre-Planning Application to be submitted.**

Should it be necessary to contact us please quote our above reference number in all communications relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

Appendix M Draft Maintenance Plan



Surface Water Drainage SuDS Maintenance Schedule

Land north of Rectory Lane, Ashington

25-036-RPT-008 Rev -

June 2026



Charles & Associates

Document Control Sheet

Project Name:	Land north of Rectory Lane, Ashington
Project Number:	25-036
Report Title:	Surface Water Drainage SuDS Maintenance Schedule
Report Number:	RPT-008

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
-	DRAFT	MT	LB	MT		June 2026

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1 Introduction & Overview

1.1 Introduction

- 1.1.1 This document details the inspection and maintenance specification for the surface water drainage system including sustainable drainage systems (SUDS) and features utilised for the proposed development site located north of Rectory Lane, Ashington, Horsham District of West Sussex.
- 1.1.2 This report should be read in conjunction with drawing 25-036-005.
- 1.1.3 In addition, along with the final Asset Register, it will be made available to the adopting body and/or maintenance organisation that will ultimately control the SuDS assets.
- 1.1.4 Most of the piped surface water drainage system on the site will be offered to Southern Water or NAV appointee under a Section 104 agreement of the Water Industry Act 1991. Once the system has been vested by Southern Water, they will become responsible for the maintenance of the adopted features of the surface water network including chambers, sewers and flow controls.
- 1.1.5 This document relates to surface water drainage features that will not be adopted by Southern Water. The features listed in this document are to be maintained by a suitably qualified management company. In the case of highway raingardens, it is anticipated that they would be adopted by West Sussex County Council as highway authority but licensed back to the management company for ongoing maintenance.
- 1.1.6 Private drainage relating to individual properties such as gutters, rainwater down pipes, private inspection chambers, rodding eyes, linear channels and yard gullies are to be maintained by the property owner.

1.2 Overview

- 1.2.1 This document is laid out in specific sections pertinent to SUDS type detailing:
- A description of the SUDS component and its use
 - Maintenance requirements and frequencies
 - Inspection requirements and frequencies
- 1.2.2 The activities listed are generic to SUDS types and represent the minimum maintenance and inspection requirements. However additional tasks, or varied maintenance frequency may be introduced as required. This may include:
- Measurement and recording of sediment levels
 - Photographic recording of problem areas

- Increased frequency of litter removal in areas identified as litter hotspots
- Adjusted timescales of maintenance activities to minimise impact on wildlife (e.g. great crested newts, birds, voles, etc)
- The use of manual methods of maintenance to limit impact on wildlife habitat (e.g. management of emergent vegetation in ponds)

This specification has been based upon CIRIA's latest technical information for SUDS (C753 The SUDS Manual, CIRIA, London: 2015)

2 Permeable Paving

2.1 Description

2.1.1 Permeable paving provides a pavement suitable for pedestrian and vehicular traffic, while allowing rainwater to permeate through the surface and into the underlying sub-base. The water is temporarily stored in the sub-base before discharging to the underlying ground (infiltrating) or discharging to a piped network (tanked or partially infiltrating).

2.1.2 Permeable paving, together with associated substructures, are an efficient means of managing surface water runoff close to source – intercepting runoff, reducing the volume and frequency of runoff and providing a treatment medium. Treatment processes that occur within the surface structure, the subsurface matrix (including soil layers where infiltration can occur) and the geotextile layers include:

- Filtration
- Adsorption
- Biodegradation
- sedimentation

2.2 Inspection, Maintenance Activities and Frequency

2.2.1 Refer to Table 2.2.1 below for maintenance activities and frequency for permeable paving.

Table 2.2.1: Permeable Paving Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Annually (after autumn leaf fall) or reduced frequency, as required, based on site observations of clogging or manufacturer's recommendations.	Particular attention should be paid to areas where water runs onto permeable paving from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required	
	Removal of weeds	As required – once per year on less frequently used pavements	

Maintenance Category	Maintenance Activity	Frequency	Comments
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the paving level	As required	
	Remedial work to any depressions, rutting or cracked/broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required	
	Rehabilitation of surface and upper substructure by remedial sweeping	10 – 15 years	Or as required if infiltration performance is reduced due to significant clogging
Monitoring	Initial inspection	Monthly	For minimum 3 months after installation. If required take remedial action
	Inspect for evidence of poor operation and weed growth	Quarterly, 48 hours after large storms for first 6 months	
	Inspect silt accumulation rates	Annually	
	Monitor inspection chambers	Annually	

3 Attenuation Basin / Detention Basin

3.1 Description

- 3.1.1 Attenuation basins are surface storage basins or facilities that provide flow control through attenuation of stormwater runoff. They also facilitate some settling of particulate pollutants. Attenuation basins are normally dry and in certain situations the land may also function as a recreational facility.

3.2 Inspection, Maintenance Activities and Frequency

- 3.2.1 Refer to Table 5.2.1 below maintenance activities and frequency for attenuation basins.

Table 4.2.1: Attenuation Basin Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Regular Maintenance	Litter and debris removal	Monthly	
	Grass cutting - for spillways and access routes	Monthly (during growing season), or as required	
	Grass cutting – meadow grass in and around basin	Half yearly (spring before nesting season and autumn)	
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)	
	Tidy all dead growth before start of growing season	Annually	
	Remove sediment from inlets, outlet and forebay	Annually (or as required)	
	Manage wetland plants in outlet pool – where provided	Annually	
Occasional Maintenance	Re-seed areas of poor vegetation growth	Annually (or as required)	
	Prune and trim trees and remove cuttings	2 years (or as required)	
	Remove sediment from forebay, when 50% full and from micropools if volume reduced by >25%	3-10 years (or as required)	
Remedial Actions	Repair of erosion or other damage by re-seeding or re-turfing	As required	

Maintenance Category	Maintenance Activity	Frequency	Comments
	Re-alignment of rip-rap	As required	
	Repair/rehabilitation of inlets, outlets and overflows	As required	
	Re-level uneven surfaces and reinstate design levels	As required	
Monitoring	Inspect / check all inlets, outlets and overflows for blockage and clear if required	Monthly and after large storms	
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly and after large storms	
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Half yearly	
	Check penstocks and other mechanical devices	Half yearly	

4 Wet Pond

4.1 Description

- 4.1.1 Ponds are permanent water SUDS used as later stages of the treatment train and regarded as site or regional controls. Ponds offer attenuation of runoff (the volume between the permanent water level and the flood level) and treatment of runoff by sedimentation and biological degradation.
- 4.1.2 Pond design (for safety) includes shallow side slopes (maximum 1:4), an aquatic safety bench planted with emergent (barrier) vegetation and a maximum depth of 3 metres. In addition to barrier vegetation public access to ponds is normally deterred by use of barrier (thorny) vegetation and where required, toddler-proof fencing (approximately 1m in height).
- 4.1.3 Subject to risk assessment, safety signs denoting “Danger no swimming”, “Danger deep water” and seasonal (ice) signs may be employed, as well as in some locations lifesaving equipment. Any signage should be located at highly visible positions around the perimeter and safety equipment should be easily accessible.
- 4.1.4 Ponds offer a high aesthetic value, and subsequently planting types can vary including use of woodland and manicured parkland effect grass around the perimeter of the barrier/fenced section, aquatic vegetation within the permanent pool, and ornamental shrubs.
- 4.1.5 Sediment forebays at the inlet area can be included in pond design; however, removal of sediment using upstream surface SUDS is preferred (allowing sediment depositions to be more easily managed) reducing the need for/ size of the forebay.
- 4.1.6 The permanent pool can be subdivided by use of berms, islands etc maximising flow paths and increasing water quality improvements. Inlet and outlet structures are normally located within hard engineered headwall structures with man entry chambers for inspection and maintenance. Inlet/outlet pipes may be either above or below the permanent water level and include flow dissipation measures such as rip-rap or Reno mattresses to minimise scour and erosion.
- 4.1.7 Emergency spillways for ponds are typically soft engineered grassed structures but may also be hard engineered using an outlet chamber and suitable flow control.

4.2 Wet Pond Maintenance Activities & Frequency

4.2.1 Refer to Table 5.2.1 below for maintenance activities and frequency for wet ponds.

Table 5.2.1: Wet Pond Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Routine Maintenance	Litter and debris removal.	Monthly.	Litter & debris to be removed prior to any grass cutting activity (of perimeter areas) to minimise risk of shredding litter. Particular attention should be paid to inlet/outlet pipes and grilles (if in place).
	Grass cutting: landscaped areas, spillways & access routes.	Monthly (during growing season) or as required.	All cuttings to be removed from SUDS component.
	Grass cutting: meadow grass.	Half yearly (Spring before nesting season, and Autumn).	All cuttings to be removed from SUDS component.
	Remove dead vegetation from pond edge.	1-3 years, or as required.	
	Hand cut submerged and emergent aquatic plants (at a minimum of 0.1m above pond base; max 1/3 of pond surface).	As required.	Thinning of emergent barrier vegetation. Areas of tall emergent plants obscuring visual inspection (for safety) of the open water should be regularly trimmed.
	Cut & remove bank vegetation from waters edge to a minimum of 1m above water level.	Monthly (for first 3 years) then as required).	To provide access to pond edge/emergent vegetation for maintenance and inspection.

Maintenance Category	Maintenance Activity	Frequency	Comments
	Manage other vegetation and remove nuisance plants.	Monthly (at implementation) then as required.	To include wetland plants in permanent pools. Weeding should be conducted by hand or use non-toxic and biodegradable weedkiller. Invasive species should be removed in accordance with best practice.
	Tidy all dead growth before start of growing season.	Annually.	
	Remove sediment from pre-treatment (if applicable).	Annually or as required.	When level reaches 50% of inspection chambers sump /
Infrequent Maintenance	Re-seed or replant areas of poor vegetation growth.	As required.	
	Prune & trim trees and remove cuttings.	As required.	Where vegetation is planted as a barrier management of upward growth to encourage outward growth is necessary (after shrub seedlings are established).
	Remove sediment from forebay.	.As required.	If pond is lined care should be taken to protect the liner; this may include digger buckets without teeth, etc. Care should be exercised to limit re-suspension of sediment into main pool.

Maintenance Category	Maintenance Activity	Frequency	Comments
	Remove sediment from main body of large ponds when pool volume is reduced by 20%	>25 years usually, or as required.	Sediment level will be dependent upon presence & type of upstream SUDS, size and land use of catchment as well as local soil conditions. Refer to above point for pond liner.
Corrective Maintenance	Repair erosion or other damage.	As required.	
	Re-alignment of rip-rap.	As required.	
	Aerate pond when signs of eutrophication are detected.		
	Repair / rehabilitation of inlets, outlets and overflows.	As required.	

5 Rain Gardens/Bioretention Features

5.1 Description

- 5.1.1 Rain Gardens/Bioretention features are shallow, landscaped depressions designed to capture, filter, and slowly absorb stormwater runoff from roofs, driveways and roads.

5.2 Inspection, Maintenance Activities and Frequency

- 5.2.1 Refer to Table 6.2.1 below maintenance activities and frequency for Rain Gardens / Bioretention features.

Table 4.2.1: Attenuation Basin Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Regular Maintenance	Litter and debris removal	Monthly	
	Grass cutting - for spillways and access routes	Monthly (during growing season), or as required	
	Grass cutting – meadow grass in and around rain garden	Half yearly (spring before nesting season and autumn)	
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)	
	Tidy all dead growth before start of growing season	Annually	
	Remove sediment from inlets and outlets	Annually (or as required)	
	Manage plants in the low feature	Annually	
Occasional Maintenance	Re-seed areas of poor vegetation growth	Annually (or as required)	
	Prune and trim trees and remove cuttings	2 years (or as required)	
Remedial Actions	Repair of erosion or other damage by re-seeding or re-turfing	As required	
	Repair/rehabilitation of inlets, outlets and overflows	As required	

Maintenance Category	Maintenance Activity	Frequency	Comments
	Re-level uneven surfaces and reinstate design levels	As required	
Monitoring	Inspect / check all inlets, outlets and overflows for blockage and clear if required	Monthly and after large storms	
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Half yearly	
	Check penstocks and other mechanical devices	Half yearly	

6 Private/Highway Drainage Piped Network

6.1 Description

- 6.1.1 The networks will consist of surface water catch pits, surface water sewers connecting to the larger SuDS features.

6.2 Inspection, Maintenance Activities and Frequency

- 6.2.1 Refer to Table 7.2.1 below for maintenance activities and frequency for catchpits.

Table 7.2.1: Catch pit Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Occasional Maintenance	Removal of silt from sump	As required	
Remediation	Replace cover and Frame	As required	
Monitoring	Initial Inspection	Post construction	Once construction is complete an inspection should be made prior to occupation of the dwellings draining to the network. Further inspection should be undertaken monthly for a minimum of 3 months once fully occupied.
	Inspect silt accumulation rate	6 monthly	6 monthly for first year. Once the silt accumulation rate has been established the frequency can be adjusted as necessary

6.2.2 Refer to Table 7.2.2 below for maintenance activities and frequency for sewers.

Table 7.2.2: Sewer Inspection, Maintenance Activities and Frequency

Maintenance Category	Maintenance Activity	Frequency	Comments
Occasional Maintenance	Jetting of pipe to remove silt build up	As required	
Remediation	Replace collapsed pipes	As required	
	Removal of root ingress using cutter. Line pipes cracked pipe	As required	
Monitoring	Initial Inspection	Post construction	Once construction is complete an inspection should be made prior to occupation of the dwellings draining to the network. Further inspection should be undertaken monthly for a minimum of 3 months once fully occupied.
	Inspect silt accumulation rate	6 monthly	6 monthly for first year. Once the silt accumulation rate has been established the frequency can be adjusted as necessary

