
Appendix 4.2 D
Surface Water Attenuation Calculations

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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SMH 1.00	Manhole	686394.755	719899.910	83.340	1.406	81.934	Circular	1.200
SMH 4.01	Manhole	686216.267	719839.644	82.859	1.330	81.529	Circular	1.200
SMH 1.07	Manhole	686222.412	719827.857	82.923	2.746	80.177	Circular	1.350
SMH 1.08	Manhole	686191.045	719807.890	82.745	2.661	80.084	Circular	1.350
SMH 1.09	Manhole	686170.409	719805.591	82.500	2.468	80.032	Circular	1.350
SMH 1.10	Manhole	686123.431	719787.879	82.000	3.264	78.736	Circular	1.200
SMH 1.11	Manhole	686131.223	719769.713	81.009	3.134	77.874	Circular	1.350
SMH 1.12	Manhole	686084.691	719740.017	80.346	2.610	77.736	Circular	1.350
SMH 1.13	Manhole	686073.415	719709.115	79.656	2.003	77.654	Circular	1.350
SMH 1.14	Manhole	686048.171	719692.216	79.000	1.422	77.578	Circular	1.350
SMH 1.06	Manhole	686248.151	719853.582	82.900	2.632	80.268	Circular	1.350
SMH 3.00	Manhole	686279.176	719837.284	81.860	1.417	80.443	Circular	1.350
SMH 1.01	Manhole	686364.162	719914.612	84.813	3.015	81.798	Circular	1.200
SMH 1.02	Manhole	686353.778	719908.306	84.693	2.944	81.749	Circular	1.200
SMH 2.00	Manhole	686299.048	719875.064	83.758	0.844	82.914	Circular	1.200
SIC 2.02	Manhole	686306.496	719864.628	83.750	0.751	82.999	Circular	1.200
SIC 2.01	Manhole	686312.006	719855.258	83.720	0.648	83.072	Circular	1.200
SIC 2.00	Manhole	686318.505	719845.513	83.600	0.450	83.150	Circular	1.200
SMH 1.03	Manhole	686340.177	719912.436	84.000	2.308	81.692	Circular	1.200
SMH 1.04	Manhole	686304.681	719891.006	84.000	2.332	81.668	Circular	1.200
SMH 4.00	Manhole	686224.745	719872.388	83.364	1.619	81.745	Circular	1.200
SMH 5.00	Manhole	686201.515	719817.419	82.900	1.350	81.550	Circular	1.200
SIC 6.02	Manhole	686204.569	719802.031	82.700	1.651	81.049	Circular	1.200
SMH 1.05	Manhole	686253.023	719858.452	82.900	1.273	81.627	Circular	1.200
SIC 6.01	Manhole	686210.444	719792.056	82.500	1.374	81.126	Circular	1.200
SIC 6.00	Manhole	686216.542	719782.784	82.200	1.000	81.200	Circular	1.200
SMH 7.00	Manhole	686168.818	719766.792	80.400	2.323	78.077	Circular	1.200
SMH 7.01	Manhole	686154.745	719784.724	81.332	3.346	77.986	Circular	1.350
SIC 8.00	Manhole	686152.769	719745.216	79.900	0.450	79.450	Circular	1.200
SIC 8.01	Manhole	686147.596	719753.340	80.500	1.114	79.386	Circular	1.200
SIC 8.02	Manhole	686141.661	719763.244	81.015	1.706	79.309	Circular	1.200
SMH 9.00	Manhole	686106.867	719616.890	79.300	1.859	77.441	Circular	1.200
SMH 9.01	Manhole	686098.659	719611.703	79.000	1.608	77.392	Circular	1.200
SMH 1.15	Manhole	686027.870	719637.070	78.100	1.562	76.538	Circular	1.200
Catchment 1 Outfall	Manhole	686002.417	719621.929	77.000	0.536	76.464	Circular	1.200
SMH 23.00	Manhole	686178.150	719858.711	84.000	0.975	83.025	Circular	1.200
SMH 23.01	Manhole	686126.393	719871.994	84.000	1.509	82.491	Circular	1.200
SMH 23.02	Manhole	686121.997	719855.678	83.640	3.278	80.362	Circular	1.200
SMH 23.03	Manhole	686132.284	719853.017	83.650	3.341	80.309	Circular	1.200
SMH 23.04	Manhole	686126.208	719829.528	82.000	1.812	80.188	Circular	1.200
SMH 24.00	Manhole	686173.893	719842.253	83.650	1.225	82.425	Circular	1.200

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Report Details: Type: Junctions Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Name	Lock
SMH 1.00	None
SMH 4.01	None
SMH 1.07	None
SMH 1.08	None
SMH 1.09	None
SMH 1.10	None
SMH 1.11	None
SMH 1.12	None
SMH 1.13	None
SMH 1.14	None
SMH 1.06	None
SMH 3.00	None
SMH 1.01	None
SMH 1.02	None
SMH 2.00	None
SIC 2.02	None
SIC 2.01	None
SIC 2.00	None
SMH 1.03	None
SMH 1.04	None
SMH 4.00	None
SMH 5.00	None
SIC 6.02	None
SMH 1.05	None
SIC 6.01	None
SIC 6.00	None
SMH 7.00	None
SMH 7.01	None
SIC 8.00	None
SIC 8.01	None
SIC 8.02	None
SMH 9.00	None
SMH 9.01	None
SMH 1.15	None
Catchment 1 Outfall	None
SMH 23.00	None
SMH 23.01	None
SMH 23.02	None
SMH 23.03	None
SMH 23.04	None
SMH 24.00	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 1.00	Inlet (1)	Weir C1-2	(None)	No Restriction
SMH 4.01	Inlet (1)	4.000	(None)	No Restriction
SMH 1.07	Inlet	4.001	(None)	No Restriction
	Inlet (1)	1.008	(None)	No Restriction
SMH 1.08	Inlet	1.009	(None)	No Restriction
	Inlet (2)	6.002	(None)	No Restriction
	Inlet (4)	5.000	(None)	No Restriction
SMH 1.09	Inlet	1.010	(None)	No Restriction
SMH 1.10	Inlet (1)	1.012	(None)	No Restriction

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Report Details: Type: Junctions Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

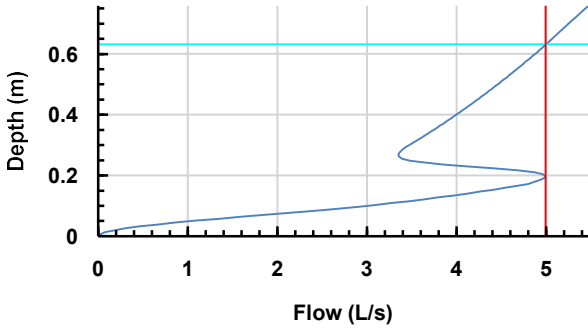
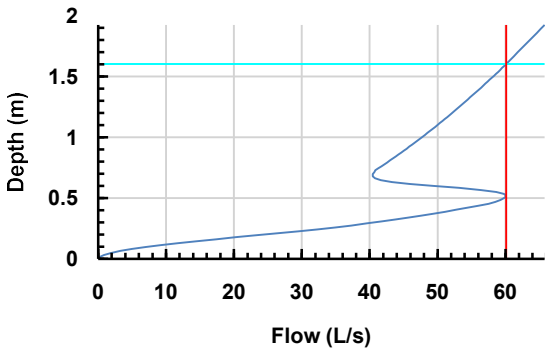
Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 1.11	Inlet	1.013	(None)	No Restriction
	Inlet (1)	8.002	(None)	No Restriction
	Inlet (2)	7.001	(None)	No Restriction
SMH 1.12	Inlet	1.014	(None)	No Restriction
	Inlet (1)	Catchment Area (49)	(None)	No Restriction
	Inlet (2)	Catchment Area (17) (1)	(None)	No Restriction
SMH 1.13	Inlet	1.015	(None)	No Restriction
	Inlet (1)	Catchment Area (16) (1)	(None)	No Restriction
SMH 1.14	Inlet	1.016	(None)	No Restriction
SMH 1.06	Inlet	1.007	(None)	No Restriction
	Inlet (2)	3.000	(None)	No Restriction
SMH 3.00	Inlet	Weir C1-4	(None)	No Restriction
SMH 1.01	Inlet	1.000	(None)	No Restriction
SMH 1.02	Inlet	1.001	(None)	No Restriction
SMH 2.00	Inlet (1)	2.002	(None)	No Restriction
SIC 2.02	Inlet	2.001	(None)	No Restriction
	Inlet (1)	No Delay (2)	(None)	No Restriction
SIC 2.01	Inlet	2.000	(None)	No Restriction
	Inlet (1)	No Delay (1)	(None)	No Restriction
SIC 2.00	Inlet	No Delay	(None)	No Restriction
SMH 1.03	Inlet	1.002	(None)	No Restriction
SMH 1.04	Inlet	1.004	(None)	No Restriction
SMH 4.00	Inlet	No Delay (6)	(None)	No Restriction
SMH 5.00	Inlet	No Delay (7)	(None)	No Restriction
SIC 6.02	Inlet	6.001	(None)	No Restriction
	Inlet (1)	No Delay (5)	(None)	No Restriction
SMH 1.05	Inlet	1.006	(None)	No Restriction
SIC 6.01	Inlet (1)	6.000	(None)	No Restriction
	Inlet (2)	No Delay (4)	(None)	No Restriction
SIC 6.00	Inlet	Catchment Area (26) No Delay (3)	(None)	No Restriction
SMH 7.00	Inlet	Weir C1-6	(None)	No Restriction
SMH 7.01	Inlet	7.000	(None)	No Restriction
SIC 8.00	Inlet	No Delay (8)	(None)	No Restriction
SIC 8.01	Inlet	8.000	(None)	No Restriction
	Inlet (1)	No Delay (9)	(None)	No Restriction
SIC 8.02	Inlet	8.001	(None)	No Restriction
	Inlet (1)	No Delay (10)	(None)	No Restriction
SMH 9.00	Inlet (1)	Weir C1-8	(None)	No Restriction
	Inlet (2)	Weir C1-10	(None)	No Restriction
SMH 9.01	Inlet	9.000	(None)	No Restriction
SMH 1.15	Inlet	1.018	(None)	No Restriction
Catchment 1 Outfall	Inlet	1.019	(None)	No Restriction
SMH 23.00	Inlet	Catchment Area (35)	(None)	No Restriction
	Inlet (1)	Catchment Area (55)	(None)	No Restriction
	Inlet (2)	Catchment Area (37)	(None)	No Restriction
SMH 23.01	Inlet	23.000	(None)	No Restriction
	Inlet (1)	Catchment Area (44)	(None)	No Restriction
	Inlet (2)	Catchment Area (53)	(None)	No Restriction
SMH 23.02	Inlet	23.001	(None)	No Restriction
	Inlet (1)	Catchment Area (45)	(None)	No Restriction
	Inlet (2)	Catchment Area (59)	(None)	No Restriction

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Report Details: Type: Junctions Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 23.03	Inlet	23.002	(None)	No Restriction
	Inlet (1)	24.000	(None)	No Restriction
	Inlet (3)	Catchment Area (43)	(None)	No Restriction
	Inlet (4)	No Delay (11)	(None)	No Restriction
	Inlet (5)	No Delay (12)	(None)	No Restriction
SMH 23.04	Inlet	23.003	(None)	No Restriction
	Inlet (1)	Catchment Area (57)	(None)	No Restriction
SMH 24.00	Inlet	Catchment Area (56)	(None)	No Restriction
	Inlet (1)	Catchment Area (38)	(None)	No Restriction

Outlets			
Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 1.00	Outlet	1.000	Free Discharge
SMH 4.01	Outlet	4.001	Free Discharge
SMH 1.07	Outlet	1.009	Free Discharge
SMH 1.08	Outlet	1.010	Free Discharge
SMH 1.09	Outlet	1.011	Free Discharge
SMH 1.10	Outlet	1.013	Free Discharge
SMH 1.11	Outlet	1.014	Free Discharge
SMH 1.12	Outlet	1.015	Free Discharge
SMH 1.13	Outlet	1.016	Free Discharge
SMH 1.14	Outlet	1.017	Free Discharge
SMH 1.06	Outlet	1.008	Free Discharge
SMH 3.00	Outlet	3.000	Free Discharge
SMH 1.01	Outlet	1.001	Free Discharge
SMH 1.02	Outlet	1.002	Free Discharge
SMH 2.00	Outlet	2.003	Free Discharge
SIC 2.02	Outlet	2.002	Free Discharge
SIC 2.01	Outlet	2.001	Free Discharge
SIC 2.00	Outlet	2.000	Free Discharge
SMH 1.03	Outlet	1.003	Free Discharge
SMH 1.04	Outlet	1.005	Free Discharge
SMH 4.00	Outlet	4.000	Free Discharge
SMH 5.00	Outlet	5.000	Free Discharge
SIC 6.02	Outlet	6.002	Free Discharge
	Outlet	1.007	Hydro-Brake®

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Report Details: Type: Junctions Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 1.05	Invert Level (m)	81.627	
	Design Depth (m)	0.632	
	Design Flow (L/s)	5.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0107-5000-0632-5000	
			
	SIC 6.01	Outlet 6.001	Free Discharge
	SIC 6.00	Outlet 6.000	Free Discharge
	SMH 7.00	Outlet 7.000	Free Discharge
	SMH 7.01	Outlet 7.001	Free Discharge
	SIC 8.00	Outlet 8.000	Free Discharge
	SIC 8.01	Outlet 8.001	Free Discharge
	SIC 8.02	Outlet 8.002	Free Discharge
	SMH 9.00	Outlet 9.000	Free Discharge
	SMH 9.01	Outlet 9.001	Free Discharge
SMH 1.15	Outlet	1.019	Hydro-Brake®
	Invert Level (m)	76.538	
	Design Depth (m)	1.602	
	Design Flow (L/s)	60.12	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0292-6012-1602-6012	
			

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Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 23.00	Outlet	23.000	Free Discharge
SMH 23.01	Outlet	23.001	Free Discharge
SMH 23.02	Outlet	23.002	Free Discharge
SMH 23.03	Outlet	23.003	Free Discharge
SMH 23.04	Outlet	23.004	Free Discharge
SMH 24.00	Outlet	24.000	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
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Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Pond 3B

Type : Pond

Dimensions

Exceedance Level (m)	84.000
Depth (m)	2.332
Base Level (m)	81.668
Freeboard (mm)	1700
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.067
Total Volume (m³)	667.384

Depth (m)	Area (m²)	Volume (m³)
0.000	934.8466	0.000
0.632	1181.9514	667.384
0.633	1396.8152	668.672
2.332	2245.3712	3734.328

Inlets

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (28)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (27) Catchment Area (33) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	1.003
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	1.004
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	67.680
Friction Scheme	Manning's n
n	0.01

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Pond 2

Type : Pond

Dimensions

Exceedance Level (m)	81.000
Depth (m)	2.750
Base Level (m)	78.250
Freeboard (mm)	1250
Initial Depth (m)	0.500
Porosity (%)	100
Average Slope (1:X)	5.641
Total Volume (m³)	2985.812

Depth (m)	Area (m²)	Volume (m³)
0.000	1298.3417	0.000
0.500	1598.3656	722.879
0.501	1920.2187	724.635
1.500	2624.9864	2985.812
1.501	3006.2295	2988.626
2.750	4036.0046	7370.743

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Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.011
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (29)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (30) Catchment Area (52) Catchment Area (54)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Point Inflow
Incoming Item(s)	23.004
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (58)
Bypass Destination	(None)
Capacity Type	No Restriction

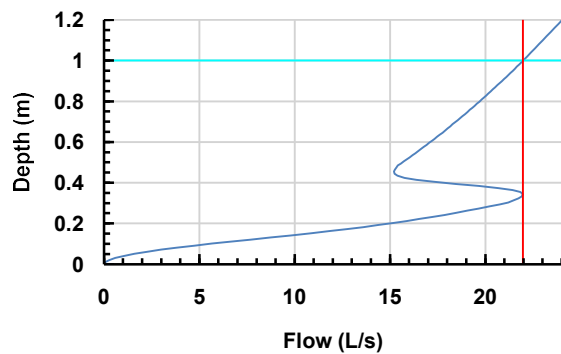
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Outlets

Outlet

Outgoing Connection	1.012
Outlet Type	Hydro-Brake®
Invert Level (m)	78.750
Design Depth (m)	1.000
Design Flow (L/s)	22.0
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference CHE-0196-2200-1000-2200



Advanced

Perimeter	Circular
Length (m)	104.067
Friction Scheme	Manning's n
n	0.01

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BL ROOF 1

Type : Tank

Dimensions

Exceedance Level (m)	83.750
Depth (m)	0.200
Base Level (m)	83.550
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	263.240

Depth (m)	Area (m²)	Volume (m³)
0.000	1316.20	0.000
0.200	1316.20	263.240

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (3)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL Roof 1- Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	83.550

Advanced

Perimeter	Circular
Length (m)	94.014

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BL ROOF 2

Type : Tank

Dimensions

Exceedance Level (m)	82.200
Depth (m)	0.200
Base Level (m)	82.000
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	263.228

Depth (m)	Area (m²)	Volume (m³)
0.000	1316.14	0.000
0.200	1316.14	263.228

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL RF 2 - Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	82.000

Advanced

Perimeter	Circular
Length (m)	94.010

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Pond 3A

Type : Pond

Dimensions

Exceedance Level (m)	82.900
Depth (m)	1.232
Base Level (m)	81.668
Freeboard (mm)	600
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	5.31
Total Volume (m³)	484.390

Depth (m)	Area (m²)	Volume (m³)
0.000	650.609300	0.000
0.632	888.432300	484.390
0.633	1099.451600	485.382
1.232	1376.523422	1225.384

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.005
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	2.003
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (28) (1) Catchment Area (32) Catchment Area (33) (1) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.006
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	62.944
Friction Scheme	Manning's n
n	0.01

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



BL ROOF 3

Type : Tank

Dimensions

Exceedance Level (m)	82.200
Depth (m)	0.200
Base Level (m)	82.000
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	263.228

Depth (m)	Area (m²)	Volume (m³)
0.000	1316.14	0.000
0.200	1316.14	263.228

Inlets

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (1) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (48)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL RF 3 - Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	82.000

Advanced

Perimeter	Circular
Length (m)	94.010



Pond 1

Type : Pond

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Dimensions

Exceedance Level (m)	79.000
Depth (m)	1.626
Base Level (m)	77.374
Freeboard (mm)	860
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	5.245
Total Volume (m³)	1510.247

Depth (m)	Area (m²)	Volume (m³)
0.000	1724.8750	0.000
0.766	2229.0886	1510.247
0.767	2577.2051	1512.648
1.626	3208.8815	3992.821

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (28) (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (29) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	9.001
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	1.017
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	1.018
Outlet Type	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Perimeter	Circular
Length (m)	110.520
Friction Scheme	Manning's n
n	0.01

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP1.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	83.750
Depth (m)	0.400
Base Level (m)	83.350
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	57.942
Long. Slope (1:X)	500.00
Width (m)	4.927
Total Volume (m³)	33.724

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (23)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (24)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (2)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP GA1

Type : Porous Paving

Dimensions

Exceedance Level (m)	84.000
Depth (m)	0.500
Base Level (m)	83.500
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	1000.0
Porosity (%)	40
Length (m)	39.675
Long. Slope (1:X)	500.00
Width (m)	5.037
Total Volume (m³)	31.599

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (46)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (11)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP1.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	83.720
Depth (m)	0.400
Base Level (m)	83.320
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.541
Long. Slope (1:X)	500.00
Width (m)	5.038
Total Volume (m³)	28.285

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (23) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (1)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP1.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	83.600
Depth (m)	0.400
Base Level (m)	83.200
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	58.434
Long. Slope (1:X)	500.00
Width (m)	5.916
Total Volume (m³)	40.712

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (23) (1) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP2.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	82.200
Depth (m)	0.400
Base Level (m)	81.800
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	50.660
Long. Slope (1:X)	500.00
Width (m)	5.117
Total Volume (m³)	30.605

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25) (1) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (3)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP2.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	82.500
Depth (m)	0.400
Base Level (m)	82.100
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.437
Long. Slope (1:X)	500.00
Width (m)	5.037
Total Volume (m³)	28.223

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (4)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP2.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	82.700
Depth (m)	0.400
Base Level (m)	82.300
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	58.075
Long. Slope (1:X)	500.00
Width (m)	5.063
Total Volume (m³)	34.718

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (5)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP GA2

Type : Porous Paving

Dimensions

Exceedance Level (m)	84.000
Depth (m)	0.500
Base Level (m)	83.500
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	1000.0
Porosity (%)	40
Length (m)	40.128
Long. Slope (1:X)	200.00
Width (m)	5.037
Total Volume (m³)	31.959

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (47)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (12)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP3.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	79.900
Depth (m)	0.400
Base Level (m)	79.500
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	50.455
Long. Slope (1:X)	500.00
Width (m)	5.043
Total Volume (m³)	30.053

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (50)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (8)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP3.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	80.500
Depth (m)	0.400
Base Level (m)	80.100
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.511
Long. Slope (1:X)	500.00
Width (m)	5.037
Total Volume (m³)	28.266

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (49) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (9)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP3.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.015
Depth (m)	0.400
Base Level (m)	80.615
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	57.381
Long. Slope (1:X)	500.00
Width (m)	5.034
Total Volume (m³)	34.113

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (18) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	No Delay (10)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC1-2

Type : Swale

Swale

Exceedance Level (m)	82.600
Depth (m)	0.650
Base Level (m)	81.950
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	52.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	152.100

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir C1-1
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (10)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (11)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (12)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	BL Roof 1- Outfall
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir C1-2
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	81.950

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Swale

Porosity (%) 100



SWC1-1

Type : Swale

Swale

Exceedance Level (m)	82.900
Depth (m)	0.650
Base Level (m)	82.250
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

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

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (7)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (8)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (9)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir C1-1
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	82.250

Advanced

Swale

Porosity (%)	100
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SWC1-4

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	81.100
Depth (m)	0.650
Base Level (m)	80.450
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	166.725

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir C1-3
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (21)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (16)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (22)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (15)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (14)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	BL RF 2 - Outfall
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir C1-4
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	80.450

Advanced

Swale

Porosity (%)	100
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SWC1-3

Type : Swale

Swale

Exceedance Level (m)	81.404
Depth (m)	0.650
Base Level (m)	80.754
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (18)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (13)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (2)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (19)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (20)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (4)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (17)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir C1-3
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	80.754

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC1-GA1

Type : Swale

Swale

Exceedance Level (m)	83.095
Depth (m)	0.500
Base Level (m)	82.595
Top Width (m)	3.282
Side Slope (1:X)	3.00
Base Width (m)	0.282
Freeboard (mm)	0
Length (m)	96.994
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	86.423

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (33)
	Catchment Area (34)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (6)
Outlet Type	Orifice
Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	82.595

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC1-GA2

Type : Swale

Swale

Exceedance Level (m)	82.900
Depth (m)	0.500
Base Level (m)	82.400
Top Width (m)	1.629
Side Slope (1:X)	1.00
Base Width (m)	0.629
Freeboard (mm)	0
Length (m)	54.262
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	30.618

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (31)
	Catchment Area (36)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (7)
Outlet Type	Orifice
Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	82.400

Advanced

Swale

Porosity (%)	100
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SWC1-6

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	78.730
Depth (m)	0.650
Base Level (m)	78.080
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	166.725

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir C1-5
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (8) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (6) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	BL RF 3 - Outfall
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (7) (1) Catchment Area (12) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir C1-6
Outlet Type	Weir
Width (m)	0.600
Coefficient of Discharge	0.544
Crest Level (m)	78.080

Advanced

Swale

Porosity (%)	100
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SWC1-5

Type : Swale

Swale

Exceedance Level (m)	79.030
Depth (m)	0.650
Base Level (m)	78.380
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (38) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (4) (2)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (5) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (10)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (9) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (11)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (10) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (11) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (51)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir C1-5
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	78.380

Advanced

Swale

Porosity (%)	100
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SWC1-9

Type : Swale

Swale

Exceedance Level (m)	78.400
Depth (m)	0.650
Base Level (m)	77.750
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	40.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	117.000

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (27) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (13) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (19) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (3) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir C1-9
Outlet Type	Weir
Width (m)	0.075
Coefficient of Discharge	0.544
Crest Level (m)	77.750

Advanced

Swale

Porosity (%)	100
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SWC1-10

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	78.100
Depth (m)	0.650
Base Level (m)	77.450
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir C1-9
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (2) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (20) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (14) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (26) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir C1-10
Outlet Type	Weir
Width (m)	0.225
Coefficient of Discharge	0.544
Crest Level (m)	77.450

Advanced

Swale

Porosity (%)	100
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SWC1-7

Type : Swale

Swale

Exceedance Level (m)	78.280
Depth (m)	0.650
Base Level (m)	77.630
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	55.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	160.875

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (22) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (24) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Designed by: MC	Checked by: RK	Approved By: DOB	
Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare				

Outlets

Outlet (1)

Outgoing Connection	Weir C1-7
Outlet Type	Weir
Width (m)	0.075
Coefficient of Discharge	0.544
Crest Level (m)	77.630

Advanced

Swale

Porosity (%)	100
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SWC1-8

Type : Swale

Swale

Exceedance Level (m)	78.100
Depth (m)	0.650
Base Level (m)	77.450
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	35.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	102.375

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Weir C1-7
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (39) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (21) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (15) (1)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25) (2)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir C1-8
Outlet Type	Weir
Width (m)	0.225
Coefficient of Discharge	0.544
Crest Level (m)	77.450

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			
Report Details: Type: Stormwater Controls Storm Phase: Catchment 1 Final	Designed by: MC	Checked by: RK	Approved By: DOB	
Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare				

Advanced	
Swale	
Porosity (%)	100

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC1-1		Time of Concentration	0.257	95	0	95	0.244
Catchment Area (1)	BL ROOF 1		Time of Concentration	0.164	95	0	95	0.156
Catchment Area (1) (1)	BL ROOF 3		Time of Concentration	0.132	95	0	95	0.125
Catchment Area (2)	SWC1-3		Time of Concentration	0.286	95	0	95	0.271
Catchment Area (2) (1)	SWC1-10		Time of Concentration	0.279	95	0	95	0.265
Catchment Area (3)	BL ROOF 1		Time of Concentration	0.132	95	0	95	0.125
Catchment Area (3) (1)	SWC1-9		Time of Concentration	0.189	95	0	95	0.179
Catchment Area (4)	SWC1-3		Time of Concentration	0.248	95	0	95	0.236
Catchment Area (4) (2)	SWC1-5		Time of Concentration	0.032	80	0	80	0.026
Catchment Area (5)	BL ROOF 2		Time of Concentration	0.166	95	0	95	0.158
Catchment Area (5) (1)	SWC1-5		Time of Concentration	0.039	100	0	100	0.039
Catchment Area (6)	BL ROOF 2		Time of Concentration	0.132	95	0	95	0.125
Catchment Area (6) (1)	SWC1-6		Time of Concentration	0.023	80	0	80	0.019
Catchment Area (7)	SWC1-1		Time of Concentration	0.033	80	0	80	0.027
Catchment Area (7) (1)	SWC1-6		Time of Concentration	0.196	80	0	80	0.157
Catchment Area (8)	SWC1-1		Time of Concentration	0.039	80	0	80	0.031
Catchment Area (8) (1)	SWC1-6		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (9)	SWC1-1		Time of Concentration	0.079	30	0	30	0.024
Catchment Area (9) (1)	SWC1-5		Time of Concentration	0.038	80	0	80	0.030
Catchment Area (10)	SWC1-2		Time of Concentration	0.025	80	0	80	0.020
Catchment Area (10) (1)	SWC1-5		Time of Concentration	0.023	80	0	80	0.019
Catchment Area (11)	SWC1-2		Time of Concentration	0.050	80	0	80	0.040
Catchment Area (11) (1)	SWC1-5		Time of Concentration	0.056	30	0	30	0.017
Catchment Area (12)	SWC1-2		Time of Concentration	0.089	30	0	30	0.027
Catchment Area (12) (1)	SWC1-6		Time of Concentration	0.064	30	0	30	0.019
Catchment Area (13)	SWC1-3		Time of Concentration	0.024	30	0	30	0.007
Catchment Area (13) (1)	SWC1-9		Time of Concentration	0.041	80	0	80	0.033
Catchment Area (14)	SWC1-4		Time of Concentration	0.008	80	0	80	0.006
Catchment Area (14) (1)	SWC1-10		Time of Concentration	0.039	80	0	80	0.031
Catchment Area (15)	SWC1-4		Time of Concentration	0.134	80	0	80	0.107

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Catchment Area (15) (1)	SWC1-8	Time of Concentration	0.038	80	0	80	0.030
Catchment Area (16)	SWC1-4	Time of Concentration	0.064	30	0	30	0.019
Catchment Area (16) (1)	SMH 1.13	Time of Concentration	0.137	80	0	80	0.110
Catchment Area (17)	SWC1-3	Time of Concentration	0.055	30	0	30	0.017
Catchment Area (17) (1)	SMH 1.12	Time of Concentration	0.047	30	0	30	0.014
Catchment Area (18)	SWC1-3	Time of Concentration	0.038	80	0	80	0.030
Catchment Area (18) (1)	PP3.3	Time of Concentration	0.059	80	0	80	0.047
Catchment Area (19)	SWC1-3	Time of Concentration	0.038	80	0	80	0.030
Catchment Area (19) (1)	SWC1-9	Time of Concentration	0.018	80	0	80	0.014
Catchment Area (20)	SWC1-3	Time of Concentration	0.031	80	0	80	0.025
Catchment Area (20) (1)	SWC1-10	Time of Concentration	0.025	80	0	80	0.020
Catchment Area (21)	SWC1-4	Time of Concentration	0.024	80	0	80	0.019
Catchment Area (21) (1)	SWC1-8	Time of Concentration	0.024	80	0	80	0.019
Catchment Area (22)	SWC1-4	Time of Concentration	0.062	80	0	80	0.050
Catchment Area (22) (1)	SWC1-7	Time of Concentration	0.010	80	0	80	0.008
Catchment Area (23)	PP1.3	Time of Concentration	0.061	80	0	80	0.049
Catchment Area (23) (1)	PP1.2	Time of Concentration	0.081	80	0	80	0.065
Catchment Area (23) (1) (1)	PP1.1	Time of Concentration	0.089	80	0	80	0.071
Catchment Area (24)	PP1.3	Time of Concentration	0.047	30	0	30	0.014
Catchment Area (24) (1)	SWC1-7	Time of Concentration	0.093	30	0	30	0.028
Catchment Area (25)	PP2.3	Time of Concentration	0.058	80	0	80	0.047
Catchment Area (25) (1)	PP2.2	Time of Concentration	0.081	80	0	80	0.065
Catchment Area (25) (1) (1)	PP2.1	Time of Concentration	0.096	80	0	80	0.077
Catchment Area (25) (2)	SWC1-8	Time of Concentration	0.089	30	0	30	0.027
Catchment Area (26)	SIC 6.00	Time of Concentration	0.047	30	0	30	0.014
Catchment Area (26) (1)	SWC1-10	Time of Concentration	0.088	30	0	30	0.026
Catchment Area (27)	Pond 3B	Time of Concentration	0.076	80	0	80	0.060
Catchment Area (27) (1)	SWC1-9	Time of Concentration	0.074	30	0	30	0.022
Catchment Area (28)	Pond 3B	Time of Concentration	0.552	30	0	30	0.166
Catchment Area (28) (1)	Pond 3A	Time of Concentration	0.205	30	0	30	0.061
Catchment Area (28) (2)	Pond 1	Time of Concentration	0.044	30	0	30	0.013

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1			Date: 07/02/2023					
Report Details: Type: Inflow Summary Storm Phase: Catchment 1 Final			Designed by: MC	Checked by: RK	Approved By: DOB			
			Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

Catchment Area (29)	Pond 2		Time of Concentration	0.083	80	0	80	0.067
Catchment Area (29) (1)	Pond 1		Time of Concentration	0.321	95	0	95	0.305
Catchment Area (30)	Pond 2		Time of Concentration	0.562	30	0	30	0.169
Catchment Area (31)	SWC1-GA2		Time of Concentration	0.134	30	0	30	0.040
Catchment Area (32)	Pond 3A		Time of Concentration	0.080	80	0	80	0.064
Catchment Area (33)	SWC1-GA1		Time of Concentration	0.090	80	0	80	0.072
Catchment Area (33) (1)	Pond 3B		Time of Concentration	0.106	80	0	80	0.084
Catchment Area (33) (1) (1)	Pond 3A		Time of Concentration	0.070	80	0	80	0.056
Catchment Area (34)	SWC1-GA1		Time of Concentration	0.303	30	0	30	0.091
Catchment Area (35)	SMH 23.00		Time of Concentration	0.104	80	0	80	0.083
Catchment Area (36)	SWC1-GA2		Time of Concentration	0.146	80	0	80	0.117
Catchment Area (37)	SMH 23.00		Time of Concentration	0.005	80	0	80	0.004
Catchment Area (38)	SMH 24.00		Time of Concentration	0.005	80	0	80	0.004
Catchment Area (38) (1)	SWC1-5		Time of Concentration	0.274	95	0	95	0.261
Catchment Area (39) (1)	SWC1-8		Time of Concentration	0.312	95	0	95	0.296
Catchment Area (43)	SMH 23.03		Time of Concentration	0.020	95	0	95	0.019
Catchment Area (44)	SMH 23.01		Time of Concentration	0.046	80	0	80	0.037
Catchment Area (45)	SMH 23.02		Time of Concentration	0.016	80	0	80	0.013
Catchment Area (46)	PP GA1		Time of Concentration	0.053	80	0	80	0.043
Catchment Area (47)	PP GA2		Time of Concentration	0.051	80	0	80	0.041
Catchment Area (48)	BL ROOF 3		Time of Concentration	0.137	95	0	95	0.130
Catchment Area (49)	SMH 1.12		Time of Concentration	0.041	80	0	80	0.033
Catchment Area (49) (1)	PP3.2		Time of Concentration	0.082	80	0	80	0.066
Catchment Area (50)	PP3.1		Time of Concentration	0.094	100	0	100	0.094
Catchment Area (51)	SWC1-5		Time of Concentration	0.288	95	0	95	0.274
Catchment Area (52)	Pond 2		Time of Concentration	0.160	30	0	30	0.048
Catchment Area (53)	SMH 23.01		Time of Concentration	0.019	95	0	95	0.018
Catchment Area (54)	Pond 2		Time of Concentration	0.039	80	0	80	0.031
Catchment Area (55)	SMH 23.00		Time of Concentration	0.019	95	0	95	0.018
Catchment Area (56)	SMH 24.00		Time of Concentration	0.019	95	0	95	0.018
Catchment Area (57)	SMH 23.04		Time of Concentration	0.031	30	0	30	0.009

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1			Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS		
Report Details: Type: Inflow Summary Storm Phase: Catchment 1 Final			Designed by: MC	Checked by: RK	Approved By: DOB			
			Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

Catchment Area (58)	Pond 2		Time of Concentration	0.030	30	0	30	0.009
Catchment Area (59)	SMH 23.02		Time of Concentration	0.026	95	0	95	0.024
TOTAL		0.0		9.243				6.466

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Title: Rainfall Analysis Criteria	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Reduced
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall

100Yr

Type: FSR

Region	Scotland And Ireland
M5-60 (mm)	16.2
Ratio R	0.287
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Summary Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SMH 1.00	100Yr: 100 years: +30 %: 4320 mins: Summer	83.34 0	81.93 4	82.238	0.304	9.5	0.344	0.000	9.4	989.377	Surcharged
SMH 4.01	100Yr: 100 years: +30 %: 30 mins: Summer	82.85 9	81.52 9	81.614	0.084	27.9	0.095	0.000	27.9	52.138	OK
SMH 1.07	100Yr: 100 years: +30 %: 60 mins: Summer	82.92 3	80.17 7	80.594	0.417	132.1	0.597	0.000	132.4	429.472	OK
SMH 1.08	100Yr: 100 years: +30 %: 60 mins: Summer	82.74 5	80.08 4	80.522	0.438	183.6	0.627	0.000	183.6	554.225	OK
SMH 1.09	100Yr: 100 years: +30 %: 60 mins: Summer	82.50 0	80.03 2	80.412	0.379	183.6	0.543	0.000	183.6	553.647	OK
SMH 1.10	100Yr: 100 years: +30 %: 5760 mins: Winter	82.00 0	78.73 6	78.850	0.114	22.0	0.129	0.000	22.0	5446.963	OK
SMH 1.11	100Yr: 100 years: +30 %: 120 mins: Summer	81.00 9	77.87 4	78.463	0.589	121.2	0.843	0.000	121.3	757.668	Surcharged
SMH 1.12	100Yr: 100 years: +30 %: 120 mins: Summer	80.34 6	77.73 6	78.241	0.505	123.7	0.722	0.000	123.8	780.216	Surcharged
SMH 1.13	100Yr: 100 years: +30 %: 60 mins: Summer	79.65 6	77.65 4	78.117	0.463	137.7	0.663	0.000	137.2	562.124	Surcharged
SMH 1.14	100Yr: 100 years: +30 %: 720 mins: Summer	79.00 0	77.57 8	77.979	0.401	107.0	0.573	0.000	107.0	2285.836	Surcharged
SMH 1.06	100Yr: 100 years: +30 %: 60 mins: Summer	82.90 0	80.26 8	80.714	0.446	106.5	0.639	0.000	106.8	362.669	Surcharged
SMH 3.00	100Yr: 100 years: +30 %: 60 mins: Summer	81.86 0	80.44 3	80.825	0.382	102.7	0.547	0.000	102.9	341.247	Surcharged
SMH 1.01	100Yr: 100 years: +30 %: 4320 mins: Summer	84.81 3	81.79 8	82.237	0.439	9.4	0.496	0.000	9.4	989.341	Surcharged
SMH 1.02	100Yr: 100 years: +30 %: 4320 mins: Summer	84.69 3	81.74 9	82.236	0.487	9.4	0.551	0.000	9.4	989.324	Surcharged
SMH 2.00	100Yr: 100 years: +30 %: 180 mins: Summer	83.75 8	82.91 4	83.172	0.258	19.7	0.291	0.000	19.7	91.564	Surcharged
SIC 2.02	100Yr: 100 years: +30 %: 180 mins: Summer	83.75 0	82.99 9	83.358	0.358	19.7	0.405	0.000	19.7	91.568	Surcharged
SIC 2.01	100Yr: 100 years: +30 %: 180 mins: Summer	83.72 0	83.07 2	83.417	0.345	12.6	0.391	0.000	12.7	62.799	Surcharged

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1				Date: 07/02/2023							
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				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare							

SIC 2.00	100Yr: 100 years: +30 %: 180 mins: Summer	83.60 0	83.15 0	83.425	0.275	7.9	0.311	0.000	8.1	31.364	Surcharged
SMH 1.03	100Yr: 100 years: +30 %: 4320 mins: Summer	84.00 0	81.69 2	82.236	0.544	9.4	0.615	0.000	9.3	989.153	Surcharged
SMH 1.04	100Yr: 100 years: +30 %: 4320 mins: Summer	84.00 0	81.66 8	82.234	0.566	4.5	0.640	0.000	4.5	1356.891	Surcharged
SMH 4.00	100Yr: 100 years: +30 %: 30 mins: Summer	83.36 4	81.74 5	81.887	0.142	27.8	0.161	0.000	27.9	52.165	OK
SMH 5.00	100Yr: 100 years: +30 %: 30 mins: Summer	82.90 0	81.55 0	81.698	0.148	28.8	0.167	0.000	28.9	50.175	OK
SIC 6.02	100Yr: 100 years: +30 %: 120 mins: Summer	82.70 0	81.04 9	81.132	0.083	26.7	0.094	0.000	26.7	83.195	OK
SMH 1.05	100Yr: 100 years: +30 %: 4320 mins: Summer	82.90 0	81.62 7	82.232	0.605	5.0	0.684	0.000	5.0	1848.596	Surcharged
SIC 6.01	100Yr: 100 years: +30 %: 120 mins: Summer	82.50 0	81.12 6	81.392	0.266	21.4	0.301	0.000	21.6	66.733	Surcharged
SIC 6.00	100Yr: 100 years: +30 %: 120 mins: Summer	82.20 0	81.20 0	81.456	0.256	13.1	0.289	0.000	12.2	39.729	Surcharged
SMH 7.00	100Yr: 100 years: +30 %: 60 mins: Summer	80.40 0	78.07 7	78.697	0.620	88.4	0.701	0.000	88.3	363.065	Surcharged
SMH 7.01	100Yr: 100 years: +30 %: 120 mins: Summer	81.33 2	77.98 6	78.526	0.540	84.6	0.772	0.000	84.6	463.406	Surcharged
SIC 8.00	100Yr: 100 years: +30 %: 120 mins: Summer	79.90 0	79.45 0	79.737	0.287	9.8	0.324	0.000	9.9	41.247	Surcharged
SIC 8.01	100Yr: 100 years: +30 %: 120 mins: Summer	80.50 0	79.38 6	79.713	0.327	16.9	0.370	0.000	16.8	68.472	Surcharged
SIC 8.02	100Yr: 100 years: +30 %: 120 mins: Summer	81.01 5	79.30 9	79.589	0.280	22.1	0.317	0.000	22.1	85.124	Surcharged
SMH 9.00	100Yr: 100 years: +30 %: 60 mins: Summer	79.30 0	77.44 1	78.021	0.580	74.8	0.655	0.000	74.0	308.384	Surcharged
SMH 9.01	100Yr: 100 years: +30 %: 720 mins: Summer	79.00 0	77.39 2	77.981	0.589	40.1	0.666	0.000	40.0	878.206	Surcharged
SMH 1.15	100Yr: 100 years: +30 %: 720 mins: Summer	78.10 0	76.53 8	77.921	1.383	58.7	1.564	0.000	59.6	3191.458	Surcharged
Catchment 1 Outfall	100Yr: 100 years: +30 %: 30 mins: Summer	77.00 0	76.46 4	76.764	0.300	59.4	0.000	0.000	59.4	95.373	OK
SMH 23.00	100Yr: 100 years: +30 %: 15 mins: Summer	84.00 0	83.02 5	83.473	0.448	56.2	0.507	0.000	48.0	24.298	Surcharged
SMH 23.01	100Yr: 100 years: +30 %: 15 mins: Summer	84.00 0	82.49 1	82.962	0.471	77.6	0.533	0.000	73.3	37.126	Surcharged
SMH 23.02	100Yr: 100 years: +30 %: 15 mins: Summer	83.64 0	80.36 2	82.073	1.711	93.1	1.935	0.000	82.5	45.692	Surcharged

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1				Date: 07/02/2023							
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SMH 23.03	100Yr: 100 years: +30 %: 15 mins: Summer	83.65 0	80.30 9	81.742	1.433	103.4	1.621	0.000	94.7	60.123	Surcharged
SMH 23.04	100Yr: 100 years: +30 %: 15 mins: Summer	82.00 0	80.18 8	80.865	0.677	99.6	0.766	0.000	96.3	62.063	Surcharged
SMH 24.00	100Yr: 100 years: +30 %: 15 mins: Summer	83.65 0	82.42 5	82.510	0.085	11.7	0.096	0.000	10.2	5.040	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 1 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Critical Storm Per Item: Rank By: Max. DS Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
SWC1-2	100Yr: 100 years: +30 %: 240 mins: Summer	82.454	82.454	0.244	0.504	36.4	76.251	0.000	0.000	22.8	288.499	49.868	OK
SWC1-1	100Yr: 100 years: +30 %: 120 mins: Summer	82.818	82.818	0.318	0.568	80.3	89.911	0.000	0.000	27.6	164.284	38.523	OK
SWC1-4	100Yr: 100 years: +30 %: 60 mins: Summer	81.035	81.034	0.300	0.584	161.2	102.580	0.000	0.000	102.7	341.434	38.473	OK
SWC1-3	100Yr: 100 years: +30 %: 60 mins: Summer	81.353	81.353	0.349	0.599	204.3	97.893	0.000	0.000	123.3	254.969	33.065	OK
Pond 3B	100Yr: 100 years: +30 %: 4320 mins: Summer	82.235	82.235	0.567	0.567	16.2	591.655	0.000	0.000	4.5	1357.251	11.347	OK
Pond 2	100Yr: 100 years: +30 %: 2880 mins: Summer	79.454	79.454	1.204	1.204	63.7	2242.623	0.000	0.000	22.0	3812.972	24.891	OK
PP1.3	100Yr: 100 years: +30 %: 120 mins: Summer	83.594	83.511	0.128	0.161	15.5	17.762	0.000	0.000	8.2	25.237	47.330	OK
PP GA1	100Yr: 100 years: +30 %: 120 mins: Summer	83.699	83.643	0.120	0.143	10.6	11.068	0.000	0.000	6.3	17.271	64.973	OK
BL ROOF 1	100Yr: 100 years: +30 %: 2880 mins: Summer	83.728	83.728	0.178	0.178	8.3	234.523	0.000	0.000	1.7	324.316	10.909	OK
BL ROOF 2	100Yr: 100 years: +30 %: 2880 mins: Summer	82.179	82.179	0.179	0.179	8.4	235.817	0.000	0.000	1.7	326.271	10.413	OK
Pond 3A	100Yr: 100 years: +30 %: 4320 mins: Summer	82.233	82.233	0.565	0.565	12.4	425.561	0.000	0.000	5.0	1848.828	12.145	OK
PP1.2	100Yr: 100 years: +30 %: 120 mins: Summer	83.561	83.493	0.146	0.173	16.1	16.181	0.000	0.000	9.2	27.530	42.791	OK
PP1.1	100Yr: 100 years: +30 %: 180 mins: Summer	83.451	83.433	0.134	0.233	14.1	25.759	0.000	0.000	7.9	32.536	36.729	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1					Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS					
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 1 Final					Designed by: MC	Checked by: RK	Approved By: DOB						
					Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare								

PP2.1	100Yr: 100 years: +30 %: 60 mins: Summer	82.065	81.981	0.164	0.181	25.5	19.247	0.000	0.000	10.5	24.107	37.113	OK
PP2.2	100Yr: 100 years: +30 %: 120 mins: Summer	82.341	82.271	0.146	0.171	16.1	16.175	0.000	0.000	9.3	27.601	42.690	OK
PP2.3	100Yr: 100 years: +30 %: 180 mins: Summer	82.519	82.434	0.103	0.134	9.2	15.017	0.000	0.000	5.4	20.082	56.745	OK
SWC1- GA1	100Yr: 100 years: +30 %: 30 mins: Summer	83.122	83.020	0.042	0.425	60.3	23.564	0.000	0.000	27.8	52.195	72.734	OK
SWC1- GA2	100Yr: 100 years: +30 %: 30 mins: Summer	82.849	82.850	0.341	0.450	58.1	22.080	0.000	0.000	28.8	50.216	27.884	OK
PP GA2	100Yr: 100 years: +30 %: 120 mins: Summer	83.794	83.649	0.094	0.149	10.1	9.875	0.000	0.000	6.9	16.565	69.103	OK
SWC1-6	100Yr: 100 years: +30 %: 60 mins: Summer	78.703	78.703	0.338	0.623	166.4	113.733	0.000	0.000	88.4	363.229	31.784	OK
SWC1-5	100Yr: 100 years: +30 %: 60 mins: Summer	79.013	79.014	0.383	0.634	220.5	106.88 6	0.000	0.000	135.8	275.079	26.916	OK
BL ROOF 3	100Yr: 100 years: +30 %: 2880 mins: Summer	82.156	82.156	0.156	0.156	7.6	204.66 2	0.000	0.000	1.7	303.042	22.249	OK
PP3.1	100Yr: 100 years: +30 %: 120 mins: Summer	79.817	79.766	0.216	0.266	23.2	25.408	0.000	0.000	9.8	41.967	15.456	OK
PP3.2	100Yr: 100 years: +30 %: 120 mins: Summer	80.342	80.271	0.147	0.171	16.2	16.266	0.000	0.000	9.3	27.829	42.455	OK
PP3.3	100Yr: 100 years: +30 %: 180 mins: Summer	80.833	80.750	0.103	0.135	9.3	14.860	0.000	0.000	5.5	20.294	56.439	OK
SWC1-9	100Yr: 100 years: +30 %: 60 mins: Summer	78.223	78.223	0.273	0.473	82.4	58.129	0.000	0.000	26.9	96.257	50.317	OK
SWC1-10	100Yr: 100 years: +30 %: 60 mins: Summer	78.047	78.048	0.347	0.598	136.9	97.487	0.000	0.000	56.9	193.701	33.342	OK
SWC1-7	100Yr: 100 years: +30 %: 180 mins: Summer	77.998	77.998	0.093	0.368	19.9	45.941	0.000	0.000	4.1	33.787	71.443	OK
SWC1-8	100Yr: 100 years: +30 %: 60 mins: Summer	78.022	78.022	0.397	0.572	123.4	70.158	0.000	0.000	40.9	143.851	31.470	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 1				Date: 07/02/2023					
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 1 Final				Designed by: MC	Checked by: RK	Approved By: DOB			
				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

Pond 1	100Yr: 100 years: +30 %: 720 mins: Summer	77.974	77.974	0.600	0.600	169.0	1150.56 3	0.000	0.000	58.7	3191.74 6	23.816	OK
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2		Date: 07/02/2023		DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS	
		Designed by: MC	Checked by: RK		Approved By: DOB
Report Details: Type: Junctions Storm Phase: Catchment 2 Final		Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Sump Depth (m)	Chamber Shape
SMH 10.15	Manhole	686262.346	719464.010	78.500	1.500	77.000	0.000	Circular
SMH 12.00	Manhole	686477.484	719674.754	81.900	1.650	80.250	0.000	Circular
SMH 12.02	Manhole	686394.386	719621.224	81.510	1.724	79.786	0.000	Circular
SMH 12.03	Manhole	686352.184	719594.181	81.200	1.649	79.551	0.000	Circular
SMH 10.12	Manhole	686297.390	719559.010	80.700	2.580	78.120	0.000	Circular
SMH 14.03	Manhole	686267.599	719547.213	79.000	1.609	77.391	0.000	Circular
SMH 10.16	Manhole	686249.393	719449.768	77.313	0.835	76.478	0.000	Circular
Catchment 2 Outfall	Manhole	686248.127	719448.404	77.197	0.727	76.470	0.000	Circular
SMH 10.11	Manhole	686301.008	719593.396	80.976	2.787	78.189	0.000	Circular
SMH 10.09	Manhole	686396.186	719654.191	81.150	2.735	78.415	0.000	Circular
SMH 10.06	Manhole	686497.308	719716.810	82.534	2.071	80.463	0.000	Circular
SMH 10.05	Manhole	686496.234	719740.623	82.725	2.143	80.582	0.000	Circular
SMH 10.10	Manhole	686343.124	719620.298	81.014	2.725	78.289	0.000	Circular
SMH 15.01	Manhole	686224.260	719546.337	78.796	1.175	77.621	0.000	Circular
SMH 15.00	Manhole	686189.754	719524.296	78.748	1.025	77.723	0.000	Circular
SMH 14.00	Manhole	686273.210	719574.329	78.760	1.282	77.478	0.000	Circular
SMH 15.02	Manhole	686269.146	719575.008	78.788	1.300	77.488	0.000	Circular
SMH 10.07	Manhole	686453.986	719689.138	82.520	2.314	80.206	0.000	Circular
SMH 13.01	Manhole	686344.027	719523.896	80.746	1.596	79.150	0.000	Circular
SMH 10.13	Manhole	686312.678	719534.742	80.700	2.637	78.063	0.000	Circular
SIC 12.02	Manhole	686483.191	719677.414	81.945	0.700	81.245	0.000	Circular
SIC 12.01	Manhole	686492.941	719683.107	81.952	0.632	81.320	0.000	Circular
SIC 12.00	Manhole	686501.806	719688.691	81.960	0.570	81.390	0.000	Circular
SMH 10.00	Manhole	686439.552	719863.984	84.250	1.233	83.017	0.000	Circular
SMH 10.01	Manhole	686439.000	719860.436	84.245	1.471	82.774	0.000	Circular
SMH 11.01	Manhole	686483.832	719795.647	83.095	1.180	81.915	0.000	Circular
SMH 11.00	Manhole	686504.765	719807.951	82.835	0.799	82.036	0.000	Circular
SMH 12.04	Manhole	686330.712	719580.392	81.065	1.634	79.431	0.000	Circular
SMH 10.02	Manhole	686481.053	719794.009	83.071	1.420	81.651	0.000	Circular
BIO 5 MAN	Manhole	686506.441	719689.602	82.000	1.000	81.000	0.500	Circular
SMH 10.03	Manhole	686497.909	719766.635	82.596	1.630	80.966	0.000	Circular
SMH 10.04	Manhole	686504.437	719745.839	82.289	1.589	80.700	0.000	Circular
SMH 10.08	Manhole	686412.852	719662.864	81.526	1.515	80.011	0.000	Circular
SMH 14.01	Manhole	686277.326	719567.935	78.760	1.301	77.459	0.000	Circular
SMH 14.02	Manhole	686279.208	719554.661	79.716	2.291	77.425	0.000	Circular
SMH 10.14	Manhole	686288.379	719519.163	79.000	1.400	77.600	0.000	Circular
SMH 12.01	Manhole	686441.818	719651.779	81.733	1.682	80.051	0.000	Circular
SMH 13.00	Manhole	686365.836	719490.572	80.773	1.425	79.348	0.000	Circular
SMH 10.02A	Manhole	686485.793	719786.312	82.937	1.690	81.247	0.000	Circular

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2		Date: 07/02/2023		DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
Report Details: Type: Junctions Storm Phase: Catchment 2 Final		Designed by: MC	Checked by: RK	
		Approved By: DOB		
		Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare		

Name	Diameter (m)	Access Required	Intersection Easting (m)	Intersection Northing (m)	Lock
SMH 10.15	1.350	☐			All
SMH 12.00	1.350	☐			All
SMH 12.02	1.500	☐			All
SMH 12.03	1.500	☐			All
SMH 10.12	1.500	☐			All
SMH 14.03	1.500	☐			All
SMH 10.16	1.350	☒	686249.393	719449.768	All
Catchment 2 Outfall	0.000	☒	686248.127	719448.404	All
SMH 10.11	1.500	☐			None
SMH 10.09	1.500	☐			None
SMH 10.06	1.500	☐			None
SMH 10.05	1.200	☐			None
SMH 10.10	1.500	☐			None
SMH 15.01	1.350	☐			None
SMH 15.00	1.200	☐			None
SMH 14.00	1.500	☐			None
SMH 15.02	1.200	☐			None
SMH 10.07	1.200	☐			None
SMH 13.01	1.200	☐			None
SMH 10.13	1.200	☐			None
SIC 12.02	0.600	☐			None
SIC 12.01	0.600	☐			None
SIC 12.00	0.600	☐			None
SMH 10.00	1.200	☐			None
SMH 10.01	1.200	☐			None
SMH 11.01	1.200	☐			None
SMH 11.00	0.600	☐			None
SMH 12.04	1.500	☐			None
SMH 10.02	1.200	☐			None
BIO 5 MAN	0.600	☐			None
SMH 10.03	1.200	☐			None
SMH 10.04	1.200	☐			None
SMH 10.08	1.200	☐			None
SMH 14.01	1.200	☐			None
SMH 14.02	1.200	☐			None
SMH 10.14	1.200	☐			None
SMH 12.01	1.500	☐			None
SMH 13.00	1.200	☐			None
SMH 10.02A	1.200	☐			None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 10.15	Inlet (1)	10.015	(None)	No Restriction
SMH 12.00	Inlet	Catchment Area (10)	(None)	No Restriction
	Inlet (1)	Catchment Area (14)	(None)	No Restriction
	Inlet (2)	BL RF 5 - Outfall	(None)	No Restriction
	Inlet (3)	Catchment Area (1)	(None)	No Restriction
	Inlet (5)	12.002	(None)	No Restriction
SMH 12.02	Inlet (1)	12.004	(None)	No Restriction
	Inlet (2)	Catchment Area (16)	(None)	No Restriction
	Inlet (3)	Catchment Area (12)	(None)	No Restriction
	Inlet (4)	Catchment Area (3)	(None)	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 12.03	Inlet	12.005	(None)	No Restriction
	Inlet (2)	Catchment Area (17)	(None)	No Restriction
	Inlet (3)	Catchment Area (13)	(None)	No Restriction
	Inlet (4)	Catchment Area (4)	(None)	No Restriction
SMH 10.12	Inlet	Catchment Area (27)	(None)	No Restriction
	Inlet (2)	10.011	(None)	No Restriction
	Inlet (3)	12.007	(None)	No Restriction
SMH 14.03	Inlet	14.002	(None)	No Restriction
SMH 10.16	Inlet	10.016	(None)	No Restriction
Catchment 2 Outfall	Inlet	10.017	(None)	No Restriction
SMH 10.11	Inlet	10.010	(None)	No Restriction
	Inlet (1)	Catchment Area (41)	(None)	No Restriction
	Inlet (2)	Catchment Area (101)	(None)	No Restriction
SMH 10.09	Inlet	10.008	(None)	No Restriction
	Inlet (2)	Catchment Area (100)	(None)	No Restriction
	Inlet (3)	Weir 2-4	(None)	No Restriction
	Inlet (4)	Catchment Area (102)	(None)	No Restriction
SMH 10.06	Inlet	10.005	(None)	No Restriction
	Inlet (1)	Catchment Area (103)	(None)	No Restriction
	Inlet (2)	Catchment Area (104)	(None)	No Restriction
	Inlet (3)	Catchment Area	(None)	No Restriction
SMH 10.05	Inlet	Weir 2-2	(None)	No Restriction
	Inlet (1)	10.004	(None)	No Restriction
	Inlet (2)	Catchment Area (105)	(None)	No Restriction
SMH 10.10	Inlet	10.009	(None)	No Restriction
	Inlet (1)	Catchment Area (106)	(None)	No Restriction
	Inlet (2)	Catchment Area (40)	(None)	No Restriction
SMH 15.01	Inlet	15.000	(None)	No Restriction
SMH 15.00	Inlet	Catchment Area (115)	(None)	No Restriction
SMH 14.00	Inlet	weir 2-6	(None)	No Restriction
	Inlet (1)	15.002	(None)	No Restriction
SMH 15.02	Inlet	Catchment Area (116)	(None)	No Restriction
	Inlet (2)	15.001	(None)	No Restriction
SMH 10.07	Inlet	10.006	(None)	No Restriction
	Inlet (1)	Catchment Area (5)	(None)	No Restriction
	Inlet (2)	Catchment Area (6)	(None)	No Restriction
SMH 13.01	Inlet	Catchment Area (31)	(None)	No Restriction
	Inlet (1)	Catchment Area (32)	(None)	No Restriction
	Inlet (2)	13.000	(None)	No Restriction
SMH 10.13	Inlet	13.001	(None)	No Restriction
	Inlet (2)	Catchment Area (28)	(None)	No Restriction
	Inlet (3)	10.012	(None)	No Restriction
SIC 12.02	Inlet	12.001	(None)	No Restriction
	Inlet (1)	No Delay (5)	(None)	No Restriction
	Inlet (2)	Catchment Area (22)	(None)	No Restriction
SIC 12.01	Inlet	12.000	(None)	No Restriction
	Inlet (1)	No Delay (4)	(None)	No Restriction
	Inlet (2)	Catchment Area (33)	(None)	No Restriction
	Inlet (3)	Catchment Area (21)	(None)	No Restriction
SIC 12.00	Inlet	No Delay (3)	(None)	No Restriction
	Inlet (1)	No Delay (8)	(None)	No Restriction
	Inlet (2)	Catchment Area (34)	(None)	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 10.00	Inlet	No Delay	(None)	No Restriction
	Inlet (1)	Catchment Area (38)	(None)	No Restriction
SMH 10.01	Inlet	10.000	(None)	No Restriction
SMH 11.01	Inlet	11.000	(None)	No Restriction
	Inlet (1)	No Delay (1)	(None)	No Restriction
SMH 11.00	Inlet	No Delay (2)	(None)	No Restriction
SMH 12.04	Inlet	12.006	(None)	No Restriction
SMH 10.02	Inlet	10.001	(None)	No Restriction
	Inlet (1)	11.001	(None)	No Restriction
BIO 5 MAN	Inlet	No Delay (9)	(None)	No Restriction
SMH 10.03	Inlet	10.002 (1)	(None)	No Restriction
SMH 10.04	Inlet	10.003	(None)	No Restriction
SMH 10.08	Inlet	10.007	(None)	No Restriction
	Inlet (1)	Catchment Area (39)	(None)	No Restriction
SMH 14.01	Inlet	14.000	(None)	No Restriction
SMH 14.02	Inlet	14.001	(None)	No Restriction
SMH 10.14	Inlet	10.013	(None)	No Restriction
SMH 12.01	Inlet	12.003	(None)	No Restriction
	Inlet (1)	Catchment Area (2)	(None)	No Restriction
	Inlet (2)	Catchment Area (15)	(None)	No Restriction
	Inlet (3)	Catchment Area (11)	(None)	No Restriction
SMH 10.02A	Inlet	10.002	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 10.15	Outlet	10.016	Hydro-Brake®
	Invert Level (m)	77.000	
	Design Depth (m)	1.262	
	Design Flow (L/s)	49.81	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0275-4981-1262-4981	
SMH 12.00	Outlet	12.003	Free Discharge
SMH 12.02	Outlet	12.005	Free Discharge
SMH 12.03	Outlet	12.006	Free Discharge
SMH 10.12	Outlet	10.012	Free Discharge
SMH 14.03	Outlet	14.003	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 10.16	Outlet	10.017	Free Discharge
SMH 10.11	Outlet	10.011	Free Discharge
SMH 10.09	Outlet	10.009	Free Discharge
SMH 10.06	Outlet	10.006	Free Discharge
SMH 10.05	Outlet	10.005	Free Discharge
SMH 10.10	Outlet	10.010	Free Discharge
SMH 15.01	Outlet	15.001	Free Discharge
SMH 15.00	Outlet	15.000	Free Discharge
SMH 14.00	Outlet	14.000	Free Discharge
SMH 15.02	Outlet	15.002	Free Discharge
SMH 10.07	Outlet	10.007	Free Discharge
SMH 13.01	Outlet	13.001	Free Discharge
SMH 10.13	Outlet	10.013	Free Discharge
SIC 12.02	Outlet	12.002	Free Discharge
SIC 12.01	Outlet	12.001	Free Discharge
SIC 12.00	Outlet	12.000	Free Discharge
SMH 10.00	Outlet	10.000	Free Discharge
SMH 10.01	Outlet	10.001	Free Discharge
SMH 11.01	Outlet	11.001	Free Discharge
SMH 11.00	Outlet	11.000	Free Discharge
SMH 12.04	Outlet	12.007	Free Discharge
SMH 10.02	Outlet	10.002	Free Discharge
BIO 5 MAN	Outlet	No Delay (8)	Orifice
	Diameter (m)	0.150	
	Coefficient of Discharge	0.600	
	Invert Level (m)	81.500	
SMH 10.03	Outlet	10.003	Free Discharge
SMH 10.04	Outlet	10.004	Free Discharge
SMH 10.08	Outlet	10.008	Free Discharge
SMH 14.01	Outlet	14.001	Free Discharge
SMH 14.02	Outlet	14.002	Free Discharge
SMH 10.14	Outlet	10.014	Free Discharge
SMH 12.01	Outlet	12.004	Free Discharge
SMH 13.00	Outlet	13.000	Free Discharge
SMH 10.02A	Outlet	10.002 (1)	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



BIO 5.1

Type : Bioretention

Ponding Area

Exceedance Level (m)	81.700
Depth (m)	0.050
Base Level (m)	81.650
Top Area (m²)	447.34
Side Slope (1:X)	1.00
Base Area (m²)	443.38
Freeboard (mm)	0
Porosity (%)	100
Length (m)	39.656
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	500.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	133.463

Filter Area

Base Level (m)	81.150
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Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Friction Scheme	Manning's n
n	0.015
Release Height (m)	0.000

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☐	Soil	0	0	0.0	Soil Type
	Storage	500	50	500.0	

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (9)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (23)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2		Date: 07/02/2023		
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final		Designed by: MC	Checked by: RK	
		Approved By: DOB		
		Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare		

Outlets

Outlet

Outgoing Connection	No Delay (10)
Outlet Type	Under Drain

Advanced

Ponding Area

Base Perimeter (m)	101.673
Top Perimeter (m)	101.873



BIO 5.2

Type : Bioretention

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Ponding Area

Exceedance Level (m)	82.000
Depth (m)	0.050
Base Level (m)	81.950
Top Area (m²)	87.93
Side Slope (1:X)	2.00
Base Area (m²)	76.13
Freeboard (mm)	0
Porosity (%)	100
Length (m)	58.966
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	500.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	19.953

Filter Area

Base Level (m)	81.450
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Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Friction Scheme	Manning's n
n	0.015
Release Height (m)	0.000

Filtration Layers

Use	Name	Filtration Layer Depth (mm)	Porosity (%)	Conductivity (m/hr)	Soil Type
☐	Soil	0	0	0.0	Soil Type
	Storage	500	40	500.0	

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (8)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (24)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	No Delay (9)
Outlet Type	Under Drain

Advanced

Ponding Area

Base Perimeter (m)	120.515
Top Perimeter (m)	120.915

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Pond 5

Type : Pond

Dimensions

Exceedance Level (m)	78.615
Depth (m)	1.853
Base Level (m)	76.762
Freeboard (mm)	353
Initial Depth (m)	0.500
Porosity (%)	100
Average Slope (1:X)	5.212
Total Volume (m³)	5335.369

Depth (m)	Area (m²)	Volume (m³)
0.000	2797.4748	0.000
0.500	3133.7943	1482.022
0.501	3485.9994	1485.330
1.500	4233.8907	5335.369
1.501	4629.1813	5339.799
1.853	4901.3121	7016.938

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	14.003
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (55)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (53)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (56)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (119)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (117)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	10.014
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	10.015
Outlet Type	Orifice
Diameter (m)	0.600
Coefficient of Discharge	0.600
Invert Level (m)	77.262

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Perimeter	Circular
Length (m)	95.291
Friction Scheme	Manning's n
n	0.01



BL ROOF 5

Type : Tank

Dimensions

Exceedance Level (m)	81.716
Depth (m)	0.200
Base Level (m)	81.516
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	255.594

Depth (m)	Area (m²)	Volume (m³)
0.000	1277.968076	0.000
0.200	1277.968076	255.594

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL RF 5 - Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	81.516

Advanced

Perimeter	Circular
Length (m)	91.312

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP5.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.850
Depth (m)	0.460
Base Level (m)	81.390
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	57.425
Long. Slope (1:X)	500.00
Width (m)	4.887
Total Volume (m³)	39.902

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (18)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (3)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP5.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.850
Depth (m)	0.460
Base Level (m)	81.390
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.424
Long. Slope (1:X)	500.00
Width (m)	4.888
Total Volume (m³)	32.953

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (19)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (4)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP5.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.850
Depth (m)	0.460
Base Level (m)	81.390
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	50.551
Long. Slope (1:X)	500.00
Width (m)	4.887
Total Volume (m³)	35.126

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (20)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	No Delay (10)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (5)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC2-2

Type : Swale

Swale

Exceedance Level (m)	81.700
Depth (m)	0.650
Base Level (m)	81.050
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	47.000
Long. Slope (1:X)	90.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	137.475

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 2-1
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (63)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (64)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (75)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (79)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (77)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet (1)

Outgoing Connection	Weir 2-2
Outlet Type	Weir
Width (m)	0.150
Coefficient of Discharge	0.544
Crest Level (m)	81.050

Advanced

Swale

Porosity (%)	100
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SWC2-1

Type : Swale

Swale

Exceedance Level (m)	82.545
Depth (m)	0.650
Base Level (m)	81.895
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	175
Length (m)	38.000
Long. Slope (1:X)	72.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	73.936

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (62)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (78)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (74)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (76)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 2-1
Outlet Type	Weir
Width (m)	0.100
Coefficient of Discharge	0.544
Crest Level (m)	81.895

Advanced

Swale

Porosity (%)	100
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SWC2-4

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	80.090
Depth (m)	0.650
Base Level (m)	79.440
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	52.472
Long. Slope (1:X)	100.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	153.482

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 2-3
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (65)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (66)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (69)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (85)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (83)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (82)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (86)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (87)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 2-4
Outlet Type	Weir
Width (m)	0.450
Coefficient of Discharge	0.544
Crest Level (m)	79.440

Advanced

Swale

Porosity (%)	100
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SWC2-3

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	81.080
Depth (m)	0.650
Base Level (m)	80.430
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	100.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (67)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (68)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (80)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (81)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (89)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (84)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (88)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir 2-3
Outlet Type	Weir
Width (m)	0.150
Coefficient of Discharge	0.544
Crest Level (m)	80.430

Advanced

Swale

Porosity (%)	100
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SWC2-6

Type : Swale

Swale

Exceedance Level (m)	78.195
Depth (m)	0.650
Base Level (m)	77.545
Top Width (m)	7.145
Side Slope (1:X)	3.19
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	250.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	187.943

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 2-5
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (70)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (72)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (97)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (99)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (98)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (96)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (95)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (118)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet (1)

Outgoing Connection	weir 2-6
Outlet Type	Weir
Width (m)	0.400
Coefficient of Discharge	0.544
Crest Level (m)	77.545

Advanced

Swale

Porosity (%)	100
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SWC2-5

Type : Swale

Swale

Exceedance Level (m)	78.885
Depth (m)	0.650
Base Level (m)	78.235
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	50.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	146.250

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (71)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (73)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (94)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (93)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (92)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (91)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (90)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir 2-5
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	78.235

Advanced

Swale

Porosity (%)	100
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SWC2-GA1

Type : Swale

Swale

Exceedance Level (m)	84.150
Depth (m)	0.500
Base Level (m)	83.650
Top Width (m)	1.471
Side Slope (1:X)	1.00
Base Width (m)	0.471
Freeboard (mm)	200
Length (m)	35.611
Long. Slope (1:X)	68.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	8.239

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (30)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (29)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay
Outlet Type	Orifice
Diameter (m)	0.225
Coefficient of Discharge	0.600
Invert Level (m)	83.650

Advanced

Swale

Porosity (%)	100
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SWC2-GA2

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	83.095
Depth (m)	0.500
Base Level (m)	82.595
Top Width (m)	1.442
Side Slope (1:X)	1.00
Base Width (m)	0.442
Freeboard (mm)	100
Length (m)	61.983
Long. Slope (1:X)	67.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	20.878

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (37)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (26)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (1)
Outlet Type	Orifice
Diameter (m)	0.150
Coefficient of Discharge	0.600
Invert Level (m)	82.595

Advanced

Swale

Porosity (%)	100
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SWC2-GA3

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	82.850
Depth (m)	0.650
Base Level (m)	82.200
Top Width (m)	3.000
Side Slope (1:X)	1.00
Base Width (m)	1.700
Freeboard (mm)	0
Length (m)	60.336
Long. Slope (1:X)	150.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	92.163

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (36)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (35)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (2)
Outlet Type	Orifice
Diameter (m)	0.225
Coefficient of Discharge	0.600
Invert Level (m)	82.200

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SMH 10.06		Time of Concentration	0.075	80	0	80	0.060
Catchment Area (1)	SMH 12.00		Time of Concentration	0.081	95	0	95	0.077
Catchment Area (2)	SMH 12.01		Time of Concentration	0.213	95	0	95	0.202
Catchment Area (3)	SMH 12.02		Time of Concentration	0.249	95	0	95	0.236
Catchment Area (4)	SMH 12.03		Time of Concentration	0.171	95	0	95	0.162
Catchment Area (5)	SMH 10.07		Time of Concentration	0.105	80	0	80	0.084
Catchment Area (6)	SMH 10.07		Time of Concentration	0.065	80	0	80	0.052
Catchment Area (7)	BL ROOF 5		Time of Concentration	0.264	95	0	95	0.251
Catchment Area (8)	BIO 5.2		Time of Concentration	0.026	80	0	80	0.021
Catchment Area (9)	BIO 5.1		Time of Concentration	0.030	80	0	80	0.024
Catchment Area (10)	SMH 12.00		Time of Concentration	0.059	80	0	80	0.047
Catchment Area (11)	SMH 12.01		Time of Concentration	0.027	80	0	80	0.021
Catchment Area (12)	SMH 12.02		Time of Concentration	0.025	80	0	80	0.020
Catchment Area (13)	SMH 12.03		Time of Concentration	0.043	80	0	80	0.034
Catchment Area (14)	SMH 12.00		Time of Concentration	0.040	80	0	80	0.032
Catchment Area (15)	SMH 12.01		Time of Concentration	0.044	80	0	80	0.035
Catchment Area (16)	SMH 12.02		Time of Concentration	0.044	80	0	80	0.035
Catchment Area (17)	SMH 12.03		Time of Concentration	0.045	80	0	80	0.036
Catchment Area (18)	PP5.3		Time of Concentration	0.029	80	0	80	0.023
Catchment Area (19)	PP5.2		Time of Concentration	0.061	80	0	80	0.049
Catchment Area (20)	PP5.1		Time of Concentration	0.075	80	0	80	0.060
Catchment Area (21)	SIC 12.01		Time of Concentration	0.008	80	0	80	0.006
Catchment Area (22)	SIC 12.02		Time of Concentration	0.009	30	0	30	0.003
Catchment Area (23)	BIO 5.1		Time of Concentration	0.045	95	0	95	0.043
Catchment Area (24)	BIO 5.2		Time of Concentration	0.018	95	0	95	0.017
Catchment Area (25)	SWC2-GA1		Time of Concentration	0.067	80	0	80	0.054
Catchment Area (26)	SWC2-GA2		Time of Concentration	0.063	80	0	80	0.051
Catchment Area (27)	SMH 10.12		Time of Concentration	0.020	80	0	80	0.016
Catchment Area (28)	SMH 10.13		Time of Concentration	0.048	80	0	80	0.038
Catchment Area (29)	SWC2-GA1		Time of Concentration	0.006	80	0	80	0.005

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Catchment Area (30)	SWC2-GA1	Time of Concentration	0.007	30	0	30	0.002
Catchment Area (31)	SMH 13.01	Time of Concentration	0.033	80	0	80	0.027
Catchment Area (32)	SMH 13.01	Time of Concentration	0.037	80	0	80	0.030
Catchment Area (33)	SIC 12.01	Time of Concentration	0.006	30	0	30	0.002
Catchment Area (34)	SIC 12.00	Time of Concentration	0.007	30	0	30	0.002
Catchment Area (35)	SWC2-GA3	Time of Concentration	0.188	95	0	95	0.179
Catchment Area (36)	SWC2-GA3	Time of Concentration	0.153	30	0	30	0.046
Catchment Area (37)	SWC2-GA2	Time of Concentration	0.052	30	0	30	0.016
Catchment Area (38)	SMH 10.00	Time of Concentration	0.269	30	0	30	0.081
Catchment Area (39)	SMH 10.08	Time of Concentration	0.013	80	0	80	0.010
Catchment Area (40)	SMH 10.10	Time of Concentration	0.052	80	0	80	0.042
Catchment Area (41)	SMH 10.11	Time of Concentration	0.024	80	0	80	0.019
Catchment Area (53)	Pond 5	Time of Concentration	0.617	30	0	30	0.185
Catchment Area (55)	Pond 5	Time of Concentration	0.085	30	0	30	0.026
Catchment Area (56)	Pond 5	Time of Concentration	0.518	95	0	95	0.492
Catchment Area (62)	SWC2-1	Time of Concentration	0.176	95	0	95	0.167
Catchment Area (63)	SWC2-2	Time of Concentration	0.071	95	0	95	0.068
Catchment Area (64)	SWC2-2	Time of Concentration	0.158	95	0	95	0.150
Catchment Area (65)	SWC2-4	Time of Concentration	0.177	95	0	95	0.168
Catchment Area (66)	SWC2-4	Time of Concentration	0.078	95	0	95	0.074
Catchment Area (67)	SWC2-3	Time of Concentration	0.204	95	0	95	0.194
Catchment Area (68)	SWC2-3	Time of Concentration	0.248	95	0	95	0.235
Catchment Area (69)	SWC2-4	Time of Concentration	0.157	95	0	95	0.149
Catchment Area (70)	SWC2-6	Time of Concentration	0.184	95	0	95	0.174
Catchment Area (71)	SWC2-5	Time of Concentration	0.289	95	0	95	0.275
Catchment Area (72)	SWC2-6	Time of Concentration	0.177	95	0	95	0.168
Catchment Area (73)	SWC2-5	Time of Concentration	0.271	95	0	95	0.257
Catchment Area (74)	SWC2-1	Time of Concentration	0.039	80	0	80	0.031
Catchment Area (75)	SWC2-2	Time of Concentration	0.048	80	0	80	0.039
Catchment Area (76)	SWC2-1	Time of Concentration	0.022	80	0	80	0.018
Catchment Area (77)	SWC2-2	Time of Concentration	0.039	80	0	80	0.032
Catchment Area (78)	SWC2-1	Time of Concentration	0.059	30	0	30	0.018

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Catchment Area (79)	SWC2-2	Time of Concentration	0.076	30	0	30	0.023
Catchment Area (80)	SWC2-3	Time of Concentration	0.041	80	0	80	0.032
Catchment Area (81)	SWC2-3	Time of Concentration	0.028	80	0	80	0.022
Catchment Area (82)	SWC2-4	Time of Concentration	0.034	80	0	80	0.027
Catchment Area (83)	SWC2-4	Time of Concentration	0.037	80	0	80	0.030
Catchment Area (84)	SWC2-3	Time of Concentration	0.055	30	0	30	0.017
Catchment Area (85)	SWC2-4	Time of Concentration	0.073	30	0	30	0.022
Catchment Area (86)	SWC2-4	Time of Concentration	0.033	80	0	80	0.026
Catchment Area (87)	SWC2-4	Time of Concentration	0.038	80	0	80	0.030
Catchment Area (88)	SWC2-3	Time of Concentration	0.047	80	0	80	0.038
Catchment Area (89)	SWC2-3	Time of Concentration	0.028	80	0	80	0.023
Catchment Area (90)	SWC2-5	Time of Concentration	0.039	80	0	80	0.031
Catchment Area (91)	SWC2-5	Time of Concentration	0.026	80	0	80	0.021
Catchment Area (92)	SWC2-5	Time of Concentration	0.054	30	0	30	0.016
Catchment Area (93)	SWC2-5	Time of Concentration	0.027	80	0	80	0.022
Catchment Area (94)	SWC2-5	Time of Concentration	0.044	80	0	80	0.035
Catchment Area (95)	SWC2-6	Time of Concentration	0.039	80	0	80	0.032
Catchment Area (96)	SWC2-6	Time of Concentration	0.037	80	0	80	0.030
Catchment Area (97)	SWC2-6	Time of Concentration	0.078	30	0	30	0.023
Catchment Area (98)	SWC2-6	Time of Concentration	0.038	80	0	80	0.031
Catchment Area (99)	SWC2-6	Time of Concentration	0.036	80	0	80	0.029
Catchment Area (100)	SMH 10.09	Time of Concentration	0.059	80	0	80	0.047
Catchment Area (101)	SMH 10.11	Time of Concentration	0.063	30	0	30	0.019
Catchment Area (102)	SMH 10.09	Time of Concentration	0.135	30	0	30	0.041
Catchment Area (103)	SMH 10.06	Time of Concentration	0.034	30	0	30	0.010
Catchment Area (104)	SMH 10.06	Time of Concentration	0.056	80	0	80	0.045
Catchment Area (105)	SMH 10.05	Time of Concentration	0.008	30	0	30	0.002
Catchment Area (106)	SMH 10.10	Time of Concentration	0.093	30	0	30	0.028
Catchment Area (115)	SMH 15.00	Time of Concentration	0.067	80	0	80	0.054
Catchment Area (116)	SMH 15.02	Time of Concentration	0.067	80	0	80	0.053
Catchment Area (117)	Pond 5	Time of Concentration	0.065	30	0	30	0.020
Catchment Area (118)	SWC2-6	Time of Concentration	0.051	30	0	30	0.015

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2			Date: 07/02/2023					
Report Details: Type: Inflow Summary Storm Phase: Catchment 2 Final			Designed by: MC	Checked by: RK	Approved By: DOB			
			Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

Catchment Area (119)	Pond 5		Time of Concentration	0.122	30	0	30	0.037
TOTAL		0.0		8.242				6.098

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			
Report Title:	Designed by: MC	Checked by: RK	Approved By: DOB	
Rainfall Analysis Criteria	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Reduced
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Prefill Manhole Sumps	☐
Perform No Discharge Analysis	☐

Rainfall

100Yr	Type: FSR
Region	Scotland And Ireland
M5-60 (mm)	16.2
Ratio R	0.287
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Summary Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SMH 10.15	100Yr: 100 years: +30 %: 720 mins: Winter	78.50 0	77.00 0	78.211	1.211	168.0	1.733	0.000	49.6	3095.986	Surcharged
SMH 12.00	100Yr: 100 years: +30 %: 15 mins: Summer	81.90 0	80.25 0	81.425	1.175	85.5	1.681	0.000	64.5	53.728	Surcharged
SMH 12.02	100Yr: 100 years: +30 %: 15 mins: Summer	81.51 0	79.78 6	81.240	1.454	326.6	2.570	0.000	299.1	179.056	Surcharged
SMH 12.03	100Yr: 100 years: +30 %: 15 mins: Summer	81.20 0	79.55 1	80.694	1.143	424.0	2.020	0.000	389.2	232.414	Surcharged
SMH 10.12	100Yr: 100 years: +30 %: 30 mins: Summer	80.70 0	78.12 0	79.424	1.304	854.0	2.304	0.000	853.0	1124.646	Surcharged
SMH 14.03	100Yr: 100 years: +30 %: 960 mins: Summer	79.00 0	77.39 1	78.190	0.799	65.4	1.413	0.000	64.8	1196.019	Surcharged
SMH 10.16	100Yr: 100 years: +30 %: 240 mins: Summer	77.31 3	76.47 8	76.749	0.272	49.8	0.389	0.000	49.8	994.956	Surcharged
Catchment 2 Outfall	100Yr: 100 years: +30 %: 15 mins: Summer	77.19 7	76.47 0	76.695	0.225	41.2	0.000	0.000	41.2	39.516	OK
SMH 10.11	100Yr: 100 years: +30 %: 30 mins: Summer	80.97 6	78.18 9	79.564	1.375	504.7	2.430	0.000	507.5	786.827	Surcharged
SMH 10.09	100Yr: 100 years: +30 %: 30 mins: Summer	81.15 0	78.41 5	79.923	1.508	487.4	2.664	0.000	491.2	757.537	Surcharged
SMH 10.06	100Yr: 100 years: +30 %: 30 mins: Summer	82.53 4	80.46 3	80.988	0.525	192.3	0.928	0.000	189.5	341.384	Surcharged
SMH 10.05	100Yr: 100 years: +30 %: 30 mins: Summer	82.72 5	80.58 2	81.164	0.582	166.3	0.658	0.000	166.8	305.322	Surcharged
SMH 10.10	100Yr: 100 years: +30 %: 30 mins: Summer	81.01 4	78.28 9	79.737	1.448	498.1	2.558	0.000	500.9	777.042	Surcharged
SMH 15.01	100Yr: 100 years: +30 %: 960 mins: Summer	78.79 6	77.62 1	78.192	0.571	3.2	0.817	0.000	2.4	62.493	Surcharged
SMH 15.00	100Yr: 100 years: +30 %: 960 mins: Summer	78.74 8	77.72 3	78.193	0.470	3.5	0.531	0.000	3.2	56.113	Surcharged
SMH 14.00	100Yr: 100 years: +30 %: 960 mins: Summer	78.76 0	77.47 8	78.189	0.711	66.7	1.256	0.000	66.4	1232.552	Surcharged
SMH 15.02	100Yr: 100 years: +30 %: 720 mins: Winter	78.78 8	77.48 8	78.193	0.705	5.7	0.797	0.000	7.1	116.695	Surcharged

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2				Date: 07/02/2023							
Report Details: Type: Junctions Summary Storm Phase: Catchment 2 Final				Designed by: MC	Checked by: RK	Approved By: DOB					
				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare							

SMH 10.07	100Yr: 100 years: +30 %: 30 mins: Summer	82.52 0	80.20 6	80.780	0.574	239.7	0.649	0.000	237.6	383.620	Surcharged
SMH 13.01	100Yr: 100 years: +30 %: 15 mins: Summer	80.74 6	79.15 0	79.302	0.152	30.4	0.172	0.000	26.4	13.149	OK
SMH 10.13	100Yr: 100 years: +30 %: 30 mins: Summer	80.70 0	78.06 3	79.049	0.986	888.1	1.115	0.000	887.3	1152.449	Surcharged
SIC 12.02	100Yr: 100 years: +30 %: 120 mins: Summer	81.94 5	81.24 5	81.485	0.240	22.7	0.068	0.000	22.7	69.562	Surcharged
SIC 12.01	100Yr: 100 years: +30 %: 60 mins: Summer	81.95 2	81.32 0	81.569	0.249	14.0	0.070	0.000	14.0	32.492	Surcharged
SIC 12.00	100Yr: 100 years: +30 %: 60 mins: Summer	81.96 0	81.39 0	81.597	0.207	9.2	0.059	0.000	8.9	16.221	Surcharged
SMH 10.00	100Yr: 100 years: +30 %: 15 mins: Summer	84.25 0	83.01 7	83.559	0.542	71.7	0.613	0.000	63.4	32.919	Surcharged
SMH 10.01	100Yr: 100 years: +30 %: 15 mins: Summer	84.24 5	82.77 4	83.443	0.669	63.4	0.756	0.000	55.4	32.560	Surcharged
SMH 11.01	100Yr: 100 years: +30 %: 30 mins: Summer	83.09 5	81.91 5	82.678	0.763	53.2	0.862	0.000	53.9	92.788	Surcharged
SMH 11.00	100Yr: 100 years: +30 %: 30 mins: Summer	82.83 5	82.03 6	82.711	0.675	48.5	0.191	0.000	48.7	71.625	Surcharged
SMH 12.04	100Yr: 100 years: +30 %: 15 mins: Summer	81.06 5	79.43 1	80.130	0.699	389.2	1.234	0.000	349.3	231.770	Surcharged
SMH 10.02	100Yr: 100 years: +30 %: 30 mins: Summer	83.07 1	81.65 1	82.662	1.011	80.6	1.143	0.000	77.0	137.965	Surcharged
BIO 5 MAN	100Yr: 100 years: +30 %: 60 mins: Summer	82.00 0	81.00 0	81.638	0.638	8.7	0.181	0.000	8.5	13.391	OK
SMH 10.03	100Yr: 100 years: +30 %: 30 mins: Summer	82.59 6	80.96 6	81.900	0.934	74.1	1.056	0.000	74.7	137.868	Surcharged
SMH 10.04	100Yr: 100 years: +30 %: 30 mins: Summer	82.28 9	80.70 0	81.419	0.719	74.7	0.813	0.000	75.9	137.834	Surcharged
SMH 10.08	100Yr: 100 years: +30 %: 30 mins: Summer	81.52 6	80.011	80.470	0.459	241.4	0.519	0.000	239.3	385.786	Surcharged
SMH 14.01	100Yr: 100 years: +30 %: 960 mins: Summer	78.76 0	77.45 9	78.191	0.732	66.4	0.827	0.000	66.0	1201.354	Surcharged
SMH 14.02	100Yr: 100 years: +30 %: 960 mins: Summer	79.71 6	77.42 5	78.192	0.767	66.0	0.867	0.000	65.4	1196.932	Surcharged
SMH 10.14	100Yr: 100 years: +30 %: 30 mins: Summer	79.00 0	77.60 0	78.424	0.824	887.3	0.933	0.000	887.0	1152.109	Surcharged
SMH 12.01	100Yr: 100 years: +30 %: 15 mins: Summer	81.73 3	80.05 1	81.365	1.315	203.5	2.323	0.000	169.8	112.247	Surcharged
SMH 13.00	100Yr: 100 years: +30 %: 15 mins: Summer	80.77 3	79.34 8	79.348	0.000	0.0	0.000	0.000	0.0	0.000	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Summary Storm Phase: Catchment 2 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

SMH 10.02A	100Yr: 100 years: +30 %: 30 mins: Summer	82.93 7	81.24 7	82.407	1.160	77.0	1.312	0.000	74.1	137.916	Surcharged
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2				Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS	
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 2 Final				Designed by: MC	Checked by: RK	Approved By: DOB		
				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare				



Critical Storm Per Item: Rank By: Max. DS Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
PP5.3	100Yr: 100 years: +30 %: 180 mins: Summer	81.582	81.521	0.077	0.131	4.6	11.024	0.000	0.000	2.9	6.780	72.373	OK
Pond 5	100Yr: 100 years: +30 %: 960 mins: Summer	78.188	78.188	1.426	1.426	354.1	5023.666	0.000	0.000	195.0	4463.159	5.842	OK
SWC2-2	100Yr: 100 years: +30 %: 60 mins: Summer	81.677	81.679	0.105	0.629	151.7	70.013	0.000	0.000	92.3	225.172	49.072	OK
SWC2-1	100Yr: 100 years: +30 %: 30 mins: Summer	82.446	82.362	0.023	0.467	86.7	31.319	0.000	0.000	51.1	74.227	57.640	OK
SWC2-4	100Yr: 100 years: +30 %: 30 mins: Summer	80.048	80.046	0.083	0.606	307.8	72.696	0.000	0.000	264.7	344.934	52.636	OK
SWC2-3	100Yr: 100 years: +30 %: 30 mins: Summer	81.061	81.061	0.131	0.631	207.5	77.525	0.000	0.000	117.3	178.184	46.991	OK
SWC2-6	100Yr: 100 years: +30 %: 960 mins: Summer	78.189	78.189	0.416	0.644	94.6	142.950	0.000	0.000	61.6	1380.869	23.940	OK
SWC2-5	100Yr: 100 years: +30 %: 60 mins: Summer	78.817	78.817	0.332	0.582	217.6	93.550	0.000	0.000	136.4	271.767	36.034	OK
PP5.2	100Yr: 100 years: +30 %: 120 mins: Summer	81.609	81.583	0.124	0.193	12.1	15.012	0.000	0.000	6.9	18.802	54.445	OK
PP5.1	100Yr: 100 years: +30 %: 120 mins: Summer	81.628	81.562	0.137	0.172	14.8	16.167	0.000	0.000	8.6	24.007	53.973	OK
BL ROOF 5	100Yr: 100 years: +30 %: 2880 mins: Summer	81.676	81.676	0.160	0.160	7.4	204.475	0.000	0.000	1.6	293.430	20.000	OK
BIO 5.1	100Yr: 100 years: +30 %: 10080 mins: Summer	81.570	81.569	0.340	0.419	0.8	84.153	0.000	0.000	0.4	53.798	36.946	OK
BIO 5.2	100Yr: 100 years: +30 %: 60 mins: Summer	81.734	81.668	0.166	0.218	12.7	6.187	0.000	0.000	8.7	14.058	68.994	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 2				Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS		
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 2 Final				Designed by: MC	Checked by: RK	Approved By: DOB			
				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

SWC2-GA1	100Yr: 100 years: +30 %: 15 mins: Summer	84.191	83.844	0.017	0.194	32.8	1.442	0.000	0.000	28.4	14.187	82.500	OK
SWC2-GA2	100Yr: 100 years: +30 %: 15 mins: Summer	83.539	82.891	0.019	0.296	35.7	3.349	0.000	0.000	22.0	15.414	83.960	OK
SWC2-GA3	100Yr: 100 years: +30 %: 30 mins: Summer	82.765	82.768	0.162	0.568	83.0	46.856	0.000	0.000	48.5	71.636	49.160	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SMH 18.00	Manhole	686560.669	719584.844	80.885	0.650	80.235	Circular	1.200
SMH 18.01	Manhole	686357.329	719453.697	80.750	1.650	79.100	Circular	1.500
SMH 18.04	Manhole	686406.589	719355.492	80.732	1.914	78.818	Circular	1.500
SMH 18.03	Manhole	686373.149	719406.780	80.793	1.822	78.971	Circular	1.500
SMH 18.02	Manhole	686356.885	719432.592	80.822	1.775	79.047	Circular	1.500
SMH 19.00	Manhole	686520.538	719398.294	80.360	1.395	78.965	Circular	1.350
SMH 19.01	Manhole	686563.254	719382.432	80.000	1.187	78.813	Circular	1.350
SMH 16.10	Manhole	686536.970	719309.434	79.000	1.291	77.709	Circular	1.350
SMH 16.11	Manhole	686506.338	719311.073	79.000	1.444	77.556	Circular	1.350
Catchment 3 Outfall	Manhole	686448.149	719322.941	79.000	1.800	77.200	Circular	1.350
SMH 16.12	Manhole	686452.805	719333.757	79.000	1.735	77.265	Circular	1.500
SMH 18.06	Manhole	686503.496	719314.428	80.000	1.445	78.555	Circular	1.500
SMH 16.03	Manhole	686621.323	719590.605	82.000	1.116	80.884	Circular	1.200
SMH 16.04	Manhole	686612.968	719579.001	82.000	1.152	80.848	Circular	1.200
SMH 16.05	Manhole	686614.849	719528.177	81.850	1.873	79.977	Circular	1.200
SMH 16.08	Manhole	686622.572	719419.796	80.640	1.907	78.733	Circular	1.200
SMH 17.00	Manhole	686552.656	719703.428	82.800	1.232	81.568	Circular	1.200
SMH 17.01	Manhole	686563.780	719700.960	82.750	1.233	81.517	Circular	1.200
SMH 17.02	Manhole	686580.002	719674.484	82.600	1.221	81.379	Circular	1.200
SMH 17.03	Manhole	686576.982	719663.491	82.500	1.172	81.328	Circular	1.200
SMH 16.06	Manhole	686603.760	719512.580	81.520	2.308	79.211	Circular	1.200
SMH 16.00	Manhole	686724.391	719671.031	82.810	1.385	81.425	Circular	1.200
SMH 16.01	Manhole	686717.072	719648.885	82.750	1.418	81.332	Circular	1.200
SMH 16.02	Manhole	686669.218	719619.757	82.800	1.692	81.108	Circular	1.200
SIC 17.02	Manhole	686531.308	719778.740	83.750	1.641	82.109	Circular	1.200
SIC 17.01	Manhole	686527.751	719789.696	83.500	1.327	82.173	Circular	1.200
SIC 17.00	Manhole	686529.831	719803.480	82.750	0.500	82.250	Circular	1.200
SMH 16.07	Manhole	686619.092	719469.258	81.286	2.305	78.981	Circular	1.200
SMH 18.07	Manhole	686534.128	719312.789	80.000	1.522	78.478	Circular	1.500
SMH 16.09	Manhole	686616.063	719417.465	80.615	1.917	78.698	Circular	1.200
SIC 18.00	Manhole	686530.744	719537.809	81.850	0.700	81.150	Circular	1.200
SIC 18.01	Manhole	686539.742	719543.264	81.700	0.620	81.080	Circular	1.200
SIC 18.02	Manhole	686548.745	719548.888	81.625	0.616	81.009	Circular	1.200
SMH 18.05	Manhole	686447.557	719338.132	80.423	1.716	78.707	Circular	1.500
SMH 22.00	Manhole	686424.784	719359.128	80.840	1.237	79.603	Circular	1.200
SMH 22.01	Manhole	686474.838	719391.475	81.120	1.815	79.305	Circular	1.200
SMH 22.02	Manhole	686482.457	719379.684	81.000	1.765	79.235	Circular	1.200

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Name	Lock
SMH 18.00	All
SMH 18.01	All
SMH 18.04	All
SMH 18.03	All
SMH 18.02	All
SMH 19.00	None
SMH 19.01	None
SMH 16.10	None
SMH 16.11	None
Catchment 3 Outfall	None
SMH 16.12	None
SMH 18.06	None
SMH 16.03	None
SMH 16.04	None
SMH 16.05	None
SMH 16.08	None
SMH 17.00	None
SMH 17.01	None
SMH 17.02	None
SMH 17.03	None
SMH 16.06	None
SMH 16.00	None
SMH 16.01	None
SMH 16.02	None
SIC 17.02	None
SIC 17.01	None
SIC 17.00	None
SMH 16.07	None
SMH 18.07	None
SMH 16.09	None
SIC 18.00	None
SIC 18.01	None
SIC 18.02	None
SMH 18.05	None
SMH 22.00	None
SMH 22.01	None
SMH 22.02	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 18.01	Inlet (1)	Weir 3-12	(None)	No Restriction
SMH 18.04	Inlet (1)	Catchment Area (47) 18.005	(None)	No Restriction
	Inlet (2)	Catchment Area (52)	(None)	No Restriction
SMH 18.03	Inlet (1)	Catchment Area (51)	(None)	No Restriction
	Inlet (2)	Catchment Area (48)	(None)	No Restriction
	Inlet (3)	18.004	(None)	No Restriction
SMH 18.02	Inlet (1)	18.003	(None)	No Restriction
	Inlet (2)	Catchment Area (50)	(None)	No Restriction
	Inlet (3)	Catchment Area (49)	(None)	No Restriction
SMH 19.00	Inlet	Weir 3- 15	(None)	No Restriction
	Inlet (1)	Weir 3- 13	(None)	No Restriction
	Inlet	19.000	(None)	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SMH 19.01	Inlet (1)	Catchment Area (10)	(None)	No Restriction
SMH 16.10	Inlet	16.012	(None)	No Restriction
SMH 16.11	Inlet	16.013	(None)	No Restriction
Catchment 3 Outfall	Inlet	16.015	(None)	No Restriction
SMH 16.12	Inlet (1)	16.014	(None)	No Restriction
SMH 18.06	Inlet	18.007	(None)	No Restriction
SMH 16.03	Inlet	16.002	(None)	No Restriction
	Inlet (2)	Weir 3-8	(None)	No Restriction
SMH 16.04	Inlet	16.003	(None)	No Restriction
SMH 16.05	Inlet (1)	16.005	(None)	No Restriction
SMH 16.08	Inlet (2)	16.008	(None)	No Restriction
SMH 17.00	Inlet	Weir 3-6	(None)	No Restriction
SMH 17.01	Inlet	17.003	(None)	No Restriction
	Inlet (2)	Catchment Area (148)	(None)	No Restriction
SMH 17.02	Inlet	17.004	(None)	No Restriction
	Inlet (1)	Catchment Area (160)	(None)	No Restriction
SMH 17.03	Inlet	17.005	(None)	No Restriction
SMH 16.06	Inlet	16.006	(None)	No Restriction
	Inlet (1)	Catchment Area (41) (2) (1) (1)	(None)	No Restriction
SMH 16.00	Inlet	Weir 3-4	(None)	No Restriction
SMH 16.01	Inlet	Catchment Area (151)	(None)	No Restriction
	Inlet (1)	16.000	(None)	No Restriction
SMH 16.02	Inlet	16.001	(None)	No Restriction
SIC 17.02	Inlet	No Delay (7)	(None)	No Restriction
	Inlet (1)	17.001	(None)	No Restriction
SIC 17.01	Inlet	No Delay (6)	(None)	No Restriction
	Inlet (1)	17.000	(None)	No Restriction
SIC 17.00	Inlet	No Delay (5)	(None)	No Restriction
SMH 16.07	Inlet	16.007	(None)	No Restriction
	Inlet (1)	Catchment Area (1)	(None)	No Restriction
SMH 18.07	Inlet (1)	18.008	(None)	No Restriction
SMH 16.09	Inlet	16.009	(None)	No Restriction
SIC 18.00	Inlet	No Delay (8)	(None)	No Restriction
SIC 18.01	Inlet	No Delay (9)	(None)	No Restriction
	Inlet (1)	18.000	(None)	No Restriction
SIC 18.02	Inlet	No Delay (10)	(None)	No Restriction
	Inlet (1)	18.001	(None)	No Restriction
SMH 18.05	Inlet	Catchment Area (41) (2)	(None)	No Restriction
	Inlet	18.006	(None)	No Restriction
SMH 22.00	Inlet	Catchment Area (130)	(None)	No Restriction
	Inlet (1)	Catchment Area (121)	(None)	No Restriction
	Inlet (2)	Catchment Area (131)	(None)	No Restriction
SMH 22.01	Inlet	22.000	(None)	No Restriction
	Inlet (1)	Catchment Area (124)	(None)	No Restriction
SMH 22.02	Inlet	22.001	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 18.00	Outlet	No Delay (4)	Orifice
	Diameter (m)	0.225	
	Coefficient of Discharge	0.600	
	Invert Level (m)	80.235	

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
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Report Details: Type: Junctions Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 18.01	Outlet	18.003	Free Discharge
SMH 18.04	Outlet (1)	18.006	Free Discharge
SMH 18.03	Outlet	18.005	Free Discharge
SMH 18.02	Outlet	18.004	Free Discharge
SMH 19.00	Outlet	19.000	Free Discharge
SMH 19.01	Outlet	19.001	Free Discharge
SMH 16.10	Outlet	16.013	Free Discharge
SMH 16.11	Outlet	16.014	Free Discharge
SMH 16.12	Outlet	16.015	Hydro-Brake®
	Invert Level (m)	77.265	
	Design Depth (m)	1.370	
	Design Flow (L/s)	70.49	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0315-7049-1370-7049	
SMH 18.06	Outlet	18.008	Free Discharge
SMH 16.03	Outlet	16.003	Free Discharge
SMH 16.04	Outlet	16.004	Free Discharge
	Outlet	16.006	Hydro-Brake®

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Junction	Outlet Name	Outgoing Connection	Outlet Type
SMH 16.05	Invert Level (m)	79.977	
	Design Depth (m)	0.885	
	Design Flow (L/s)	22.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0199-2200-0885-2200	
SMH 16.08	Outlet	16.009	Free Discharge
SMH 17.00	Outlet	17.003	Free Discharge
SMH 17.01	Outlet	17.004	Free Discharge
SMH 17.02	Outlet	17.005	Free Discharge
SMH 17.03	Outlet	17.006	Free Discharge
SMH 16.06	Outlet	16.007	Free Discharge
SMH 16.00	Outlet	16.000	Free Discharge
SMH 16.01	Outlet	16.001	Free Discharge
SMH 16.02	Outlet	16.002	Free Discharge
SIC 17.02	Outlet	17.002	Free Discharge
SIC 17.01	Outlet	17.001	Free Discharge
SIC 17.00	Outlet	17.000	Free Discharge
SMH 16.07	Outlet	16.008	Free Discharge
SMH 18.07	Outlet	18.009	Free Discharge
SMH 16.09	Outlet	16.010	Free Discharge
SIC 18.00	Outlet	18.000	Free Discharge
SIC 18.01	Outlet	18.001	Free Discharge
SIC 18.02	Outlet	18.002	Free Discharge
SMH 18.05	Outlet	18.007	Free Discharge
SMH 22.00	Outlet	22.000	Free Discharge
SMH 22.01	Outlet	22.001	Free Discharge
SMH 22.02	Outlet	22.002	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



BL ROOF 6

Type : Tank

Dimensions

Exceedance Level (m)	80.585
Depth (m)	0.200
Base Level (m)	80.385
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	263.176

Depth (m)	Area (m²)	Volume (m³)
0.000	1315.880503	0.000
0.200	1315.880503	263.176

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (42)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (120)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL RF 6- Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	80.385

Advanced

Perimeter	Circular
Length (m)	93.950



Pond 6B

Type : Pond

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Dimensions

Exceedance Level (m)	79.185
Depth (m)	1.435
Base Level (m)	77.750
Freeboard (mm)	550
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.041
Total Volume (m³)	1292.296

Depth (m)	Area (m²)	Volume (m³)
0.000	1225.00	0.000
1.435	2050.00	2324.553

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	18.009
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	16.011
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	16.012
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	67.086
Friction Scheme	Manning's n
n	0.01

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Pond 4

Type : Pond

Dimensions

Exceedance Level (m)	81.850
Depth (m)	2.350
Base Level (m)	79.500
Freeboard (mm)	965
Initial Depth (m)	0.500
Porosity (%)	100
Average Slope (1:X)	3.169
Total Volume (m³)	3617.834

Depth (m)	Area (m²)	Volume (m³)
0.000	2225.00	0.000
2.350	3644.60	6828.528

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	16.004
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (167) Catchment Area (139)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	16.005
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	94.064
Friction Scheme	Manning's n
n	0.01

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Designed by: MC	Checked by: RK	Approved By: DOB	
Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare				



BL ROOF 4

Type : Tank

Dimensions

Exceedance Level (m)	83.285
Depth (m)	0.200
Base Level (m)	83.085
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m³)	263.230

Depth (m)	Area (m²)	Volume (m³)
0.000	1316.15	0.000
0.200	1316.15	263.230

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (158)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BL RF 4 - Outfall
Outlet Type	Orifice
Diameter (m)	0.047
Coefficient of Discharge	0.600
Invert Level (m)	83.085

Advanced

Perimeter	Circular
Length (m)	94.011



Pond 6A

Type : Pond

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Dimensions

Exceedance Level (m)	79.185
Depth (m)	1.435
Base Level (m)	77.750
Freeboard (mm)	525
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.82
Total Volume (m³)	1059.862

Depth (m)	Area (m²)	Volume (m³)
0.000	910.00	0.000
1.435	1800.00	1908.475

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (4)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (3)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (11)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	19.001
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Point Inflow
Incoming Item(s)	16.010
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	16.011
Outlet Type	Free Discharge

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Perimeter	Circular
Length (m)	70.389
Friction Scheme	Manning's n
n	0.01

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP6.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.625
Depth (m)	0.460
Base Level (m)	81.165
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	57.549
Long. Slope (1:X)	500.00
Width (m)	5.096
Total Volume (m³)	41.667

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (41)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (61) Catchment Area (41) (2) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (10)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP4.3

Type : Porous Paving

Dimensions

Exceedance Level (m)	82.750
Depth (m)	0.460
Base Level (m)	82.290
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	55.074
Long. Slope (1:X)	500.00
Width (m)	4.955
Total Volume (m³)	38.517

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	110
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (156) (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (5)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP4.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	83.500
Depth (m)	0.460
Base Level (m)	83.040
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.579
Long. Slope (1:X)	500.00
Width (m)	5.053
Total Volume (m³)	33.931

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	110
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (156) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (6)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP4.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	83.750
Depth (m)	0.460
Base Level (m)	83.290
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	51.817
Long. Slope (1:X)	500.00
Width (m)	5.180
Total Volume (m³)	37.873

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	110
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (156)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (7)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP6.2

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.700
Depth (m)	0.460
Base Level (m)	81.240
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	47.868
Long. Slope (1:X)	500.00
Width (m)	5.037
Total Volume (m³)	34.266

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (41) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (9)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



PP6.1

Type : Porous Paving

Dimensions

Exceedance Level (m)	81.850
Depth (m)	0.460
Base Level (m)	81.390
Paving Layer Depth (mm)	110
Membrane Percolation (m/hr)	500.0
Porosity (%)	40
Length (m)	50.710
Long. Slope (1:X)	500.00
Width (m)	5.037
Total Volume (m³)	36.301

Under Drain

Height Above Base (m)	0.050
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (41) (1) (1)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	No Delay (8)
Outlet Type	Under Drain

Advanced

Conductivity (m/hr)	500.0
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC3-9

Type : Swale

Swale

Exceedance Level (m)	80.798
Depth (m)	0.650
Base Level (m)	80.148
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	183.398

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	No Delay (4)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (29)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (60)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (19)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (23)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

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

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (40)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	18.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-9
Outlet Type	Weir
Width (m)	0.100
Coefficient of Discharge	0.544
Crest Level (m)	80.148

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC3-10

Type : Swale

Swale

Exceedance Level (m)	80.499
Depth (m)	0.650
Base Level (m)	79.849
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	183.397

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-9
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (30)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (20)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (24)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (34)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (39)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (43)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (9)

Inlet Type	Point Inflow
Incoming Item(s)	BL RF 6- Outfall
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-10
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	79.849

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



SWC3-11

Type : Swale

Swale

Exceedance Level (m)	80.199
Depth (m)	0.650
Base Level (m)	79.549
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	183.397

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-10
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (31)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (21)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (25)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (8)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (35)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (6)

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

Inlet (7)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (44)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-11
Outlet Type	Weir
Width (m)	0.350
Coefficient of Discharge	0.544
Crest Level (m)	79.549

Advanced

Swale

Porosity (%)	100
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SWC3-12

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	79.900
Depth (m)	0.650
Base Level (m)	79.250
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	57.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	183.398

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-11
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

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

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (22)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (26)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (36)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlet (6)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (37)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (7)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (46)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (8)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (45)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (9)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-12
Outlet Type	Weir
Width (m)	0.600
Coefficient of Discharge	0.544
Crest Level (m)	79.250

Advanced

Swale

Porosity (%)	100
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SWC3-14

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	79.935
Depth (m)	0.650
Base Level (m)	79.285
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	47.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	151.223

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (134)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (127)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Weir 3- 14
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	79.285

Advanced

Swale

Porosity (%)	100
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SWC3-15

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	79.650
Depth (m)	0.650
Base Level (m)	79.000
Top Width (m)	6.900
Side Slope (1:X)	3.00
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	55.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	176.963

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3- 14
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (133)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (128)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (126)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (123)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet (1)

Outgoing Connection	Weir 3- 15
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	79.000

Advanced

Swale

Porosity (%)	100
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SWC3-13

Type : Swale

Swale

Exceedance Level (m)	79.650
Depth (m)	0.650
Base Level (m)	79.000
Top Width (m)	7.200
Side Slope (1:X)	3.00
Base Width (m)	3.300
Freeboard (mm)	0
Length (m)	45.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	153.563

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (122)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (125)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (129)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (132)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	22.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Weir 3- 13
Outlet Type	Weir
Width (m)	0.100
Coefficient of Discharge	0.544
Crest Level (m)	79.000

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Swale

Porosity (%) 100



SWC3-1

Type : Swale

Swale

Exceedance Level (m)	82.832
Depth (m)	0.650
Base Level (m)	82.182
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	55.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	160.875

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	BL RF 4 - Outfall
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (143)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (155)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (166)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet

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

Outlets

Outlet (1)

Outgoing Connection	Weir 3-1
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	82.182

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced	
Swale	
Porosity (%)	100



SWC3-2

Type : Swale

Swale	
Exceedance Level (m)	82.544
Depth (m)	0.650
Base Level (m)	81.894
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	55.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	160.875

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-1
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (142)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (154)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (165)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Weir 3-2
Outlet Type	Weir
Width (m)	0.100
Coefficient of Discharge	0.544
Crest Level (m)	81.894

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Swale

Porosity (%) 100



SWC3-3

Type : Swale

Swale

Exceedance Level (m)	82.260
Depth (m)	0.650
Base Level (m)	81.610
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	55.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	160.875

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (141)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (153)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (164)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-2
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (14)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-3
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	81.610

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Advanced

Swale

Porosity (%) 100



SWC3-4

Type : Swale

Swale

Exceedance Level (m)	82.150
Depth (m)	0.650
Base Level (m)	81.500
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	20.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	58.500

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-3
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (140)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (152)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (163)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-4
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	81.500

Advanced

Swale

Porosity (%)	100
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SWC3-5

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	82.436
Depth (m)	0.650
Base Level (m)	81.786
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	38.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	111.150

Inlets

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (112)
	Catchment Area (111)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (109)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (146)
	Catchment Area (108)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	17.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir 3-5
Outlet Type	Weir
Width (m)	0.050
Coefficient of Discharge	0.544
Crest Level (m)	81.786

Advanced

Swale

Porosity (%)	100
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SWC3-6

Type : Swale

Swale

Exceedance Level (m)	82.235
Depth (m)	0.650
Base Level (m)	81.585
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	38.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	111.150

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-5
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (113)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (147)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (159)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-6
Outlet Type	Weir
Width (m)	0.100
Coefficient of Discharge	0.544
Crest Level (m)	81.585

Advanced

Swale

Porosity (%)	100
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SWC3-7

Type : Swale

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Swale

Exceedance Level (m)	81.754
Depth (m)	0.650
Base Level (m)	81.104
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	43.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	125.775

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	17.006
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (114)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (149)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (161)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Outlets

Outlet

Outgoing Connection	Weir 3-7
Outlet Type	Weir
Width (m)	0.200
Coefficient of Discharge	0.544
Crest Level (m)	81.104

Advanced

Swale

Porosity (%)	100
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SWC3-8

Type : Swale

Swale

Exceedance Level (m)	81.540
Depth (m)	0.650
Base Level (m)	80.890
Top Width (m)	6.000
Side Slope (1:X)	2.31
Base Width (m)	3.000
Freeboard (mm)	0
Length (m)	40.000
Long. Slope (1:X)	200.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.01
Total Volume (m³)	117.000

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inlets

Inlet (9)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (138)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Weir 3-7
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area (150)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (162)
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Weir 3-8
Outlet Type	Weir
Width (m)	1.000
Coefficient of Discharge	0.544
Crest Level (m)	80.890

Advanced

Swale

Porosity (%)	100
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Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	SWC3-1		Time of Concentration	0.141	30	0	30	0.042
Catchment Area (1)	SMH 16.07		Time of Concentration	0.052	80	0	80	0.041
Catchment Area (2)	Pond 6B		Time of Concentration	0.045	80	0	80	0.036
Catchment Area (3)	Pond 6A		Time of Concentration	0.038	80	0	80	0.030
Catchment Area (4)	Pond 6A		Time of Concentration	0.218	30	0	30	0.065
Catchment Area (5)	SWC3-2		Time of Concentration	0.335	30	0	30	0.100
Catchment Area (6)	SWC3-9		Time of Concentration	0.086	95	0	95	0.081
Catchment Area (7)	SWC3-10		Time of Concentration	0.218	95	0	95	0.207
Catchment Area (8)	SWC3-11		Time of Concentration	0.250	95	0	95	0.238
Catchment Area (9)	SWC3-12		Time of Concentration	0.179	95	0	95	0.170
Catchment Area (10)	SMH 19.01		Time of Concentration	0.175	90	0	90	0.158
Catchment Area (11)	Pond 6A		Time of Concentration	0.038	30	0	30	0.011
Catchment Area (12)	Pond 6B		Time of Concentration	0.202	90	0	90	0.182
Catchment Area (13)	Pond 6B		Time of Concentration	0.374	30	0	30	0.112
Catchment Area (14)	SWC3-3		Time of Concentration	0.412	30	0	30	0.124
Catchment Area (19)	SWC3-9		Time of Concentration	0.118	80	0	80	0.095
Catchment Area (20)	SWC3-10		Time of Concentration	0.046	80	0	80	0.036
Catchment Area (21)	SWC3-11		Time of Concentration	0.045	80	0	80	0.036
Catchment Area (22)	SWC3-12		Time of Concentration	0.060	80	0	80	0.048
Catchment Area (23)	SWC3-9		Time of Concentration	0.014	80	0	80	0.011
Catchment Area (24)	SWC3-10		Time of Concentration	0.028	80	0	80	0.022
Catchment Area (25)	SWC3-11		Time of Concentration	0.028	80	0	80	0.022
Catchment Area (26)	SWC3-12		Time of Concentration	0.023	80	0	80	0.018
Catchment Area (29)	SWC3-9		Time of Concentration	0.091	30	0	30	0.027
Catchment Area (30)	SWC3-10		Time of Concentration	0.088	30	0	30	0.026
Catchment Area (31)	SWC3-11		Time of Concentration	0.089	30	0	30	0.027
Catchment Area (32)	SWC3-12		Time of Concentration	0.129	30	0	30	0.039
Catchment Area (33)	SWC3-9		Time of Concentration	0.052	80	0	80	0.042
Catchment Area (34)	SWC3-10		Time of Concentration	0.044	80	0	80	0.035
Catchment Area (35)	SWC3-11		Time of Concentration	0.045	80	0	80	0.036

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Catchment Area (36)	SWC3-12		Time of Concentration	0.046	80	0	80	0.037
Catchment Area (37)	SWC3-12		Time of Concentration	0.034	80	0	80	0.027
Catchment Area (38)	SWC3-11		Time of Concentration	0.038	80	0	80	0.030
Catchment Area (39)	SWC3-10		Time of Concentration	0.036	80	0	80	0.029
Catchment Area (40)	SWC3-9		Time of Concentration	0.028	80	0	80	0.023
Catchment Area (41)	PP6.3		Time of Concentration	0.072	80	0	80	0.058
Catchment Area (41) (1)	PP6.2		Time of Concentration	0.079	80	0	80	0.063
Catchment Area (41) (1) (1)	PP6.1		Time of Concentration	0.059	80	0	80	0.047
Catchment Area (41) (2)	SIC 18.02		Time of Concentration	0.027	80	0	80	0.021
Catchment Area (41) (2) (1)	PP6.3		Time of Concentration	0.134	30	0	30	0.040
Catchment Area (41) (2) (1) (1)	SMH 16.06		Time of Concentration	0.104	80	0	80	0.083
Catchment Area (42)	BL ROOF 6		Time of Concentration	0.132	95	0	95	0.125
Catchment Area (43)	SWC3-10		Time of Concentration	0.161	95	0	95	0.153
Catchment Area (44)	SWC3-11		Time of Concentration	0.291	95	0	95	0.277
Catchment Area (45)	SWC3-12		Time of Concentration	0.095	95	0	95	0.090
Catchment Area (46)	SWC3-12		Time of Concentration	0.190	95	0	95	0.181
Catchment Area (47)	SMH 18.04		Time of Concentration	0.019	80	0	80	0.015
Catchment Area (48)	SMH 18.03		Time of Concentration	0.019	80	0	80	0.015
Catchment Area (49)	SMH 18.02		Time of Concentration	0.002	80	0	80	0.002
Catchment Area (50)	SMH 18.02		Time of Concentration	0.021	80	0	80	0.017
Catchment Area (51)	SMH 18.03		Time of Concentration	0.031	80	0	80	0.025
Catchment Area (52)	SMH 18.04		Time of Concentration	0.033	80	0	80	0.026
Catchment Area (60)	SWC3-9		Time of Concentration	0.079	80	0	80	0.063
Catchment Area (61)	PP6.3		Time of Concentration	0.047	30	0	30	0.014
Catchment Area (108)	SWC3-5		Time of Concentration	0.015	80	0	80	0.012
Catchment Area (109)	SWC3-5		Time of Concentration	0.025	80	0	80	0.020
Catchment Area (111)	SWC3-5		Time of Concentration	0.082	30	0	30	0.024
Catchment Area (112)	SWC3-5		Time of Concentration	0.092	30	0	30	0.028
Catchment Area (113)	SWC3-6		Time of Concentration	0.148	30	0	30	0.044
Catchment Area (114)	SWC3-7		Time of Concentration	0.376	30	0	30	0.113

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Inflow Summary Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Catchment Area (120)	BL ROOF 6	Time of Concentration	0.168	95	0	95	0.160
Catchment Area (121)	SMH 22.00	Time of Concentration	0.272	100	0	100	0.272
Catchment Area (122)	SWC3-13	Time of Concentration	0.177	95	0	95	0.168
Catchment Area (123)	SWC3-15	Time of Concentration	0.256	95	0	95	0.243
Catchment Area (124)	SMH 22.01	Time of Concentration	0.027	80	0	80	0.021
Catchment Area (125)	SWC3-13	Time of Concentration	0.017	80	0	80	0.014
Catchment Area (126)	SWC3-15	Time of Concentration	0.031	80	0	80	0.025
Catchment Area (127)	SWC3-14	Time of Concentration	0.113	80	0	80	0.090
Catchment Area (128)	SWC3-15	Time of Concentration	0.047	80	0	80	0.037
Catchment Area (129)	SWC3-13	Time of Concentration	0.027	80	0	80	0.022
Catchment Area (130)	SMH 22.00	Time of Concentration	0.063	80	0	80	0.051
Catchment Area (131)	SMH 22.00	Time of Concentration	0.071	30	0	30	0.021
Catchment Area (132)	SWC3-13	Time of Concentration	0.041	30	0	30	0.012
Catchment Area (133)	SWC3-15	Time of Concentration	0.070	30	0	30	0.021
Catchment Area (134)	SWC3-14	Time of Concentration	0.069	30	0	30	0.021
Catchment Area (138)	SWC3-8	Time of Concentration	0.168	30	0	30	0.050
Catchment Area (139)	Pond 4	Time of Concentration	0.207	30	0	30	0.062
Catchment Area (140)	SWC3-4	Time of Concentration	0.015	30	0	30	0.004
Catchment Area (141)	SWC3-3	Time of Concentration	0.043	30	0	30	0.013
Catchment Area (142)	SWC3-2	Time of Concentration	0.043	30	0	30	0.013
Catchment Area (143)	SWC3-1	Time of Concentration	0.074	30	0	30	0.022
Catchment Area (146)	SWC3-5	Time of Concentration	0.041	80	0	80	0.033
Catchment Area (147)	SWC3-6	Time of Concentration	0.056	80	0	80	0.045
Catchment Area (148)	SMH 17.01	Time of Concentration	0.048	80	0	80	0.039
Catchment Area (149)	SWC3-7	Time of Concentration	0.061	80	0	80	0.049
Catchment Area (150)	SWC3-8	Time of Concentration	0.056	80	0	80	0.045
Catchment Area (151)	SMH 16.01	Time of Concentration	0.149	80	0	80	0.119
Catchment Area (152)	SWC3-4	Time of Concentration	0.032	80	0	80	0.026
Catchment Area (153)	SWC3-3	Time of Concentration	0.073	80	0	80	0.059
Catchment Area (154)	SWC3-2	Time of Concentration	0.072	80	0	80	0.058
Catchment Area (155)	SWC3-1	Time of Concentration	0.189	80	0	80	0.151
Catchment Area (156)	PP4.1	Time of Concentration	0.075	80	0	80	0.060

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3			Date: 07/02/2023					
Report Details: Type: Inflow Summary Storm Phase: Catchment 3 Final			Designed by: MC	Checked by: RK	Approved By: DOB			
			Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare					

Catchment Area (156) (1)	PP4.2		Time of Concentration	0.102	80	0	80	0.082
Catchment Area (156) (2)	PP4.3		Time of Concentration	0.104	80	0	80	0.083
Catchment Area (158)	BL ROOF 4		Time of Concentration	0.236	95	0	95	0.225
Catchment Area (159)	SWC3-6		Time of Concentration	0.204	95	0	95	0.194
Catchment Area (160)	SMH 17.02		Time of Concentration	0.220	95	0	95	0.209
Catchment Area (161)	SWC3-7		Time of Concentration	0.175	95	0	95	0.166
Catchment Area (162)	SWC3-8		Time of Concentration	0.186	95	0	95	0.177
Catchment Area (163)	SWC3-4		Time of Concentration	0.170	95	0	95	0.162
Catchment Area (164)	SWC3-3		Time of Concentration	0.167	95	0	95	0.158
Catchment Area (165)	SWC3-2		Time of Concentration	0.198	95	0	95	0.188
Catchment Area (166)	SWC3-1		Time of Concentration	0.182	95	0	95	0.173
Catchment Area (167)	Pond 4		Time of Concentration	0.697	30	0	30	0.209
TOTAL		0.0		11.664				7.869

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Title: Rainfall Analysis Criteria	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Reduced
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall

100Yr

Type: FSR

Region	Scotland And Ireland
M5-60 (mm)	16.2
Ratio R	0.287
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	30.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Junctions Summary Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SMH 18.00	100Yr: 100 years: +30 %: 15 mins: Summer	80.88 5	80.23 5	80.235	0.000	0.0	0.000	0.000	0.0	0.000	OK
SMH 18.01	100Yr: 100 years: +30 %: 60 mins: Summer	80.75 0	79.10 0	79.681	0.581	312.0	1.027	0.000	311.5	907.447	OK
SMH 18.04	100Yr: 100 years: +30 %: 60 mins: Summer	80.73 2	78.81 8	79.362	0.544	324.9	0.962	0.000	324.2	942.727	OK
SMH 18.03	100Yr: 100 years: +30 %: 60 mins: Summer	80.79 3	78.97 1	79.516	0.545	319.7	0.963	0.000	318.9	928.275	OK
SMH 18.02	100Yr: 100 years: +30 %: 60 mins: Summer	80.82 2	79.04 7	79.609	0.562	314.3	0.993	0.000	313.8	913.877	OK
SMH 19.00	100Yr: 100 years: +30 %: 120 mins: Summer	80.36 0	78.96 5	79.283	0.318	67.7	0.455	0.000	67.8	500.469	Surcharged
SMH 19.01	100Yr: 100 years: +30 %: 30 mins: Summer	80.00 0	78.81 3	79.152	0.339	99.2	0.485	0.000	98.4	189.533	Surcharged
SMH 16.10	100Yr: 100 years: +30 %: 720 mins: Summer	79.00 0	77.70 9	78.617	0.908	69.3	1.299	0.000	69.1	4281.352	Surcharged
SMH 16.11	100Yr: 100 years: +30 %: 720 mins: Summer	79.00 0	77.55 6	78.579	1.024	69.1	1.465	0.000	68.7	4275.970	Surcharged
Catchment 3 Outfall	100Yr: 100 years: +30 %: 5760 mins: Summer	79.00 0	77.20 0	77.381	0.181	70.7	0.000	0.000	70.7	12301.229	OK
SMH 16.12	100Yr: 100 years: +30 %: 720 mins: Summer	79.00 0	77.26 5	78.517	1.252	68.7	2.212	0.000	68.3	4270.740	Surcharged
SMH 18.06	100Yr: 100 years: +30 %: 60 mins: Summer	80.00 0	78.55 5	79.057	0.502	323.0	0.887	0.000	321.8	937.967	OK
SMH 16.03	100Yr: 100 years: +30 %: 60 mins: Summer	82.00 0	80.88 4	81.466	0.583	252.9	0.659	0.000	252.7	945.651	Surcharged
SMH 16.04	100Yr: 100 years: +30 %: 60 mins: Summer	82.00 0	80.84 8	81.322	0.474	252.7	0.537	0.000	252.6	944.333	Surcharged
SMH 16.05	100Yr: 100 years: +30 %: 2160 mins: Summer	81.85 0	79.97 7	80.857	0.880	22.0	0.995	0.000	22.0	3655.621	Surcharged
SMH 16.08	100Yr: 100 years: +30 %: 15 mins: Summer	80.64 0	78.73 3	79.049	0.316	51.6	0.358	0.000	48.8	30.720	Surcharged
SMH 17.00	100Yr: 100 years: +30 %: 60 mins: Summer	82.80 0	81.56 8	82.171	0.603	40.5	0.682	0.000	40.9	169.769	Surcharged

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3				Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS			
Report Details: Type: Junctions Summary Storm Phase: Catchment 3 Final				Designed by: MC	Checked by: RK	Approved By: DOB				
				Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare						

SMH 17.01	100Yr: 100 years: +30 %: 15 mins: Summer	82.75 0	81.51 7	82.153	0.636	39.9	0.719	0.000	36.5	42.698	Surcharged
SMH 17.02	100Yr: 100 years: +30 %: 15 mins: Summer	82.60 0	81.37 9	82.204	0.825	112.4	0.933	0.000	90.2	82.719	Surcharged
SMH 17.03	100Yr: 100 years: +30 %: 60 mins: Summer	82.50 0	81.32 8	81.807	0.479	75.2	0.542	0.000	74.8	265.420	Surcharged
SMH 16.06	100Yr: 100 years: +30 %: 15 mins: Summer	81.52 0	79.211	79.846	0.634	44.7	0.718	0.000	36.2	21.713	Surcharged
SMH 16.00	100Yr: 100 years: +30 %: 60 mins: Summer	82.81 0	81.42 5	81.928	0.503	100.3	0.569	0.000	100.5	421.893	Surcharged
SMH 16.01	100Yr: 100 years: +30 %: 60 mins: Summer	82.75 0	81.33 2	81.858	0.527	117.6	0.596	0.000	116.0	469.545	Surcharged
SMH 16.02	100Yr: 100 years: +30 %: 60 mins: Summer	82.80 0	81.10 8	81.664	0.556	116.0	0.629	0.000	114.5	467.301	Surcharged
SIC 17.02	100Yr: 100 years: +30 %: 240 mins: Summer	83.75 0	82.10 9	82.450	0.341	16.8	0.385	0.000	16.6	125.238	Surcharged
SIC 17.01	100Yr: 100 years: +30 %: 240 mins: Summer	83.50 0	82.17 3	82.496	0.324	11.9	0.366	0.000	11.7	93.504	Surcharged
SIC 17.00	100Yr: 100 years: +30 %: 240 mins: Summer	82.75 0	82.25 0	82.506	0.256	5.8	0.290	0.000	5.4	47.006	Surcharged
SMH 16.07	100Yr: 100 years: +30 %: 15 mins: Summer	81.28 6	78.98 1	79.595	0.614	58.4	0.695	0.000	51.6	30.934	Surcharged
SMH 18.07	100Yr: 100 years: +30 %: 60 mins: Summer	80.00 0	78.47 8	78.924	0.446	321.8	0.789	0.000	321.2	936.588	OK
SMH 16.09	100Yr: 100 years: +30 %: 15 mins: Summer	80.61 5	78.69 8	78.952	0.254	48.8	0.288	0.000	46.4	30.587	Surcharged
SIC 18.00	100Yr: 100 years: +30 %: 120 mins: Summer	81.85 0	81.15 0	81.465	0.315	6.0	0.356	0.000	5.7	17.366	Surcharged
SIC 18.01	100Yr: 100 years: +30 %: 120 mins: Summer	81.70 0	81.08 0	81.451	0.371	11.4	0.419	0.000	11.2	42.963	Surcharged
SIC 18.02	100Yr: 100 years: +30 %: 120 mins: Summer	81.62 5	81.00 9	81.403	0.394	23.0	0.445	0.000	22.6	102.905	Surcharged
SMH 18.05	100Yr: 100 years: +30 %: 60 mins: Summer	80.42 3	78.70 7	79.230	0.523	324.2	0.925	0.000	323.0	940.295	OK
SMH 22.00	100Yr: 100 years: +30 %: 15 mins: Summer	80.84 0	79.60 3	80.201	0.598	48.1	0.676	0.000	37.3	31.160	Surcharged
SMH 22.01	100Yr: 100 years: +30 %: 15 mins: Summer	81.12 0	79.30 5	79.849	0.544	48.7	0.616	0.000	40.9	35.506	Surcharged
SMH 22.02	100Yr: 100 years: +30 %: 15 mins: Summer	81.00 0	79.23 5	79.731	0.496	40.9	0.561	0.000	35.6	35.118	Surcharged

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3	Date: 07/02/2023			DONNACHADH O'BRIEN & ASSOCIATES CONSULTING ENGINEERS
	Designed by: MC	Checked by: RK	Approved By: DOB	
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 3 Final	Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare			



Critical Storm Per Item: Rank By: Max. DS Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
SWC3-9	100Yr: 100 years: +30 %: 120 mins: Summer	80.683	80.683	0.250	0.535	105.9	95.129	0.000	0.000	52.2	279.055	48.130	OK
SWC3-10	100Yr: 100 years: +30 %: 60 mins: Summer	80.427	80.427	0.293	0.578	209.4	108.666	0.000	0.000	116.4	397.479	40.748	OK
SWC3-11	100Yr: 100 years: +30 %: 60 mins: Summer	80.170	80.170	0.336	0.621	322.2	122.850	0.000	0.000	226.1	662.930	33.014	OK
SWC3-12	100Yr: 100 years: +30 %: 60 mins: Summer	79.838	79.838	0.303	0.588	407.0	111.729	0.000	0.000	312.0	908.234	39.078	OK
PP6.3	100Yr: 100 years: +30 %: 120 mins: Summer	81.524	81.444	0.243	0.279	27.7	32.025	0.000	0.000	10.4	49.703	23.139	OK
BL ROOF 6	100Yr: 100 years: +30 %: 2880 mins: Summer	80.564	80.564	0.179	0.179	8.4	235.496	0.000	0.000	1.7	331.552	10.518	OK
SWC3-14	100Yr: 100 years: +30 %: 180 mins: Summer	79.607	79.607	0.087	0.322	21.9	35.719	0.000	0.000	6.2	65.067	76.380	OK
SWC3-15	100Yr: 100 years: +30 %: 180 mins: Summer	79.593	79.593	0.318	0.593	69.7	110.901	0.000	0.000	23.8	252.529	37.331	OK
SWC3-13	100Yr: 100 years: +30 %: 120 mins: Summer	79.529	79.529	0.304	0.529	90.4	86.150	0.000	0.000	43.9	300.274	43.899	OK
Pond 6B	100Yr: 100 years: +30 %: 720 mins: Summer	78.633	78.633	0.883	0.883	185.7	1288.182	0.000	0.000	69.3	4297.961	0.318	OK
SWC3-1	100Yr: 100 years: +30 %: 120 mins: Summer	82.816	82.816	0.359	0.634	96.5	114.472	0.000	0.000	28.6	203.780	28.844	OK
SWC3-2	100Yr: 100 years: +30 %: 120 mins: Summer	82.490	82.490	0.321	0.596	111.7	103.539	0.000	0.000	56.6	381.579	35.640	OK
SWC3-3	100Yr: 100 years: +30 %: 120 mins: Summer	82.203	82.203	0.318	0.593	135.8	102.751	0.000	0.000	84.9	559.152	36.130	OK

Herbata Data Centre: Halverstown, Naas Co. Kildare Surface Water Analysis- Catchment 3					Date: 07/02/2023							
Report Details: Type: Stormwater Controls Summary Storm Phase: Catchment 3 Final					Designed by: MC	Checked by: RK	Approved By: DOB					
					Donnachadh O'Brien & Associates: Unit 5C Elm House Millennium Park, Naas Co. Kildare							

SWC3-4	100Yr: 100 years: +30 %: 120 mins: Summer	82.096	82.096	0.496	0.596	113.1	46.635	0.000	0.000	101.9	654.530	20.283	OK
SWC3-5	100Yr: 100 years: +30 %: 240 mins: Summer	82.297	82.297	0.321	0.511	35.9	62.930	0.000	0.000	19.3	199.461	43.382	OK
SWC3-6	100Yr: 100 years: +30 %: 120 mins: Summer	82.208	82.208	0.433	0.623	75.9	85.012	0.000	0.000	39.1	284.610	23.516	OK
SWC3-7	100Yr: 100 years: +30 %: 60 mins: Summer	81.718	81.718	0.399	0.614	183.3	91.294	0.000	0.000	112.6	386.058	27.415	OK
SWC3-8	100Yr: 100 years: +30 %: 60 mins: Summer	81.473	81.473	0.383	0.583	194.1	80.018	0.000	0.000	141.5	481.766	31.608	OK
Pond 4	100Yr: 100 years: +30 %: 2160 mins: Summer	80.870	80.870	1.370	1.370	105.0	3571.9 92	0.000	0.000	22.0	3655.87 3	1.267	OK
PP4.3	100Yr: 100 years: +30 %: 240 mins: Summer	82.626	82.534	0.226	0.244	13.9	27.019	0.000	0.000	5.8	47.290	29.850	OK
BL ROOF 4	100Yr: 100 years: +30 %: 2880 mins: Summer	83.223	83.223	0.138	0.138	6.7	182.05 0	0.000	0.000	1.5	262.740	30.840	OK
PP4.2	100Yr: 100 years: +30 %: 60 mins: Summer	83.370	83.234	0.235	0.194	27.1	22.407	0.000	0.000	7.5	24.571	33.963	OK
PP4.1	100Yr: 100 years: +30 %: 120 mins: Summer	83.550	83.445	0.157	0.155	14.8	18.590	0.000	0.000	5.5	23.850	50.916	OK
Pond 6A	100Yr: 100 years: +30 %: 720 mins: Summer	78.658	78.658	0.908	0.908	102.2	1056.9 77	0.000	0.000	38.2	2176.14 4	0.272	OK
PP6.2	100Yr: 100 years: +30 %: 120 mins: Summer	81.487	81.464	0.151	0.224	15.5	18.458	0.000	0.000	6.8	26.145	46.133	OK
PP6.1	100Yr: 100 years: +30 %: 120 mins: Summer	81.604	81.533	0.113	0.143	11.6	13.859	0.000	0.000	6.0	17.788	61.823	OK