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LEGEND:

- APPLICATION BOUNDARY
- EXISTING TREE AND ROOT PROTECTION AREA

PRIVATE DRAINAGE:
(SURVEYED BY MALCOLM HUGHES 2022)

- FWSCO — FOUL SEWER AND MANHOLE
- SWSCO — SURFACE WATER SEWER AND MANHOLE
- CWSCO — COMBINED WATER SEWER AND MANHOLE

PUBLIC DRAINAGE:
(ANGLIAN WATER ASSET RECORDS 2024)

- FS FWS — FOUL SEWER AND MANHOLE
- SS SWS — SURFACE WATER SEWER AND MANHOLE

Rev	Date	Description	By	Chk
P01	16.07.24	FIRST ISSUE	GJ	CP

Amendments

Project
PROJECT OTTER

Title
EXISTING DRAINAGE LAYOUT

Client
RAILPEN LTD

waterman

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+44 207 928 7888
mail@watermangroup.com www.watermangroup.com

Work Stage: STAGE 3 Spatial coordination — RIBA
Suitability: COORDINATION — S1

Designed By	GJ	Director	AS	Waterman Ref	WIE17469
Drawn By	GJ	Date	16.07.24	Scales @ A1	1:500

Project | Originator | Functional | Spatial | Form | Discipline | Number: EPBP-WAT-ZZ-XX-DR-C-920505
Revision: P01

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240522 - Asset Records (Anglian Water), 240522 - Topographic Survey (Greenhatch), 240522 - Utilities Survey - JUST DRAINAGE (Malcolm Hughes), A1-Wat-ISO-S-2023, OS, WIE17469-100_SA_77_Tree_Survey

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LEGEND:

- APPLICATION BOUNDARY
- PROPOSED NORTHERN CATCHMENT (TO OUTFALL TO COLDHARBOUR LANE SEWER)
- PROPOSED SOUTHERN CATCHMENT (TO OUTFALL TO YORK STREET SEWER)
- PROPOSED PERMEABLE LANDSCAPING AREAS
- EXISTING HIGHWAY AREA TO REMAIN (EXCL. FROM HYDRAULIC MODELLING)
- EXISTING PERMEABLE VEGETATION (EXCL. FROM HYDRULIC MODELLING

CATCHMENT SUMMARY	AREA (msq)	AREA (Ha)
APPLICATION BOUNDARY	78,500	7.85
NORTHERN CATCHMENT	22,420	2.24
SOUTHERN CATCHMENT	30,747	3.07
PROPOSED PERMEABLE AREAS	10,886	1.09
EXISTING HIGHWAY AREAS	7,250	0.73
EXISTING VEGETATION AREAS	7,181	0.72

Rev	Date	Description	By	Chk
P01	16.07.24	FIRST ISSUE	GJ	CP

Amendments

Project
PROJECT OTTER

Title
PROPOSED SURFACE WATER CATCHMENT LAYOUT

Client
RAILPEN LTD

waterman

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mail@watermangroup.com www.watermangroup.com

Work Stage: STAGE 3 Spatial coordination — RIBA
Suitability: COORDINATION — S1

Designed By	Director	Waterman Ref	
GJ	CP	WIE17469-110	
Drawn By	Date	Scales @ A1	
GJ	16.07.24	1:1000	

Project	Originator	Functional	Spatial	Form	Discipline	Number	Revision
17469	WAT	OTT	XX	DR	C	920509	P01

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A1-Wat-ISO-S-2023, OS

SuDS Feature	DESIGN VOLUMES (m^3)		
	Northern Catchment	Southern Catchment	Total Attenuation
Blue Roof	284	870	1,154
Rain Gardens	3,423	3,675	7,098
Below Ground Attenuation Tanks	891	1,188	2,079
Permeable Paving	874	1,632	2,506
Detention Basin	626	–	626
	6,098	7,365	13,463

TABLE NOTES:

1. BLUE ROOF ASSUMED TO HAVE CRATED SYSTEM WITH 95% VOID RATIO.
2. RAIN GARDENS UTILISE PONDING STORAGE AND GRAVEL ATTENUATION LAYER. REFER TO INFODRAINAGE MODELLING FOR DEPTHS USED.
3. BELOW GROUND ATTENUATION TANKS ASSUMED TO HAVE CRATED SYSTEM WITH 95% VOID RATIO WITH MINIMUM 1m COVER TO GROUND LEVEL.
4. PERMEABLE PAVING ASSUMED TO HAVE 30% VOID RATIO GRAVEL AND DESIGNED TO BE NON-INFILTRATING (LINED WITH IMPERMEABLE MEMBRANE).
5. FOR FULL EXTENTS OF SURFACE FINISHES AND SOFT LANDSCAPING REFER TO LDA-D LANDSCAPE MASTERPLAN.
6. DESIGN VOLUMES SUBJECT TO REVIEW AT DETAILED DESIGN FOLLOWING DEVELOPMENT OF FINAL SURFACE LEVELS.

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DRAINAGE NOTES:

1. REFER TO WATERMAN FLOOD RISK AND DRAINAGE STRATEGY REPORT FOR FULL DETAILS OF DRAINAGE RATIONALE AND DESIGN PARAMETERS SUMMARY.
2. EXISTING DRAINAGE AND UTILITIES WITHIN SITE BOUNDARY NOT SHOWN. TO BE ABANDONED AND DIVERTED BY OTHERS.
3. SUSTAINABLE URBAN DRAINAGE FEATURES DESIGNED USING AUTODESK INFODRAINAGE 2024.
4. DESIGN RAINFALL EVENTS ANALYSED INCL. 1-1 YEAR, 1-30 YEAR WITH 35% CLIMATE CHANGE AND 1-100 YEAR WITH 40% CLIMATE CHANGE. USING FEH 2022 RAINFALL DATA.
5. PROPOSED DISCHARGE RATES AT SITE OUTFALLS BASED ON GREENFIELD QBAR RATE OF 1.35 L/s/Ha
6. FOR PROPOSED SURFACE WATER CATCHMENT LAYOUT REFER TO 17469-WAT-OTT-XX-DR-C-920509.
7. FULL DRAINAGE NETWORK DESIGN (ROAD GULLYS, PERFORATED PIPES, INSPECTION CHAMBERS AND RODDING POINTS) SUBJECT TO DETAILED DESIGN.
8. FINAL LEVELS SUBJECT TO DETAILED DESIGN.
9. CONNECTION POINTS TO ANGLIAN WATER NETWORK SUBJECT TO PREDEVELOPMENT ENQUIRY APPROVAL AND SECTION 106 AGREEMENT BY CONTRACTOR.
10. ALL BLOCKS WITH BLUE ROOF TO BE RESTRICTED AS SHOWN ON PLAN. BEFORE DISCHARGING INTO SITEWIDE NETWORK. BLOCKS WITH NO BLUE ROOF TO HAVE FREE DISCHARGE INTO SITEWIDE DRAINAGE NETWORK.

LEGEND:

- APPLICATION BOUNDARY

EXISTING DRAINAGE (ANGLIAN WATER):

- EX. IWS — SURFACE WATER SEWER
- EX. IWS — FOUL SEWER

PROPOSED DRAINAGE:

- SW — SURFACE WATER SEWER AND MANHOLE
- FLOW CONTROL MANHOLE
- BLUE ROOF (100mm DEPTH OF STORAGE 95% VOID RATIO)
- RAIN GARDEN / BIORETENTION AREAS
- PERMEABLE PAVING
- BELOW GROUND GEOCELLULAR TANK
- DETENTION BASIN

Rev	Date	Description	By	Chk
P02	16.07.24	UPDATED FOLLOWING FINAL MASTERPLAN	GJ	CP
P01	20.06.24	FIRST ISSUE	GJ	CP

Amendments

Project
PROJECT OTTER

Title
PROPOSED DRAINAGE LAYOUT

Client
RAILPEN LTD

waterman

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mail@watermangroup.com www.watermangroup.com

Work Stage: STAGE 3 (Spatial coordination) — RIBA
Suitability: COORDINATION — S1

Designed By	GJ	Director	CP	Waterman Ref	WIE17469-110
Drawn By	GJ	Date	20.06.2024	Scales @ A1	1:1000

Project	Originator	Functional	Spatial	Form	Discipline	Number	Revision
17469-WAT-OTT-XX-DR-C-920510							P02

File Path: N:\Projects\WIE17469\06 Project Other\7_CAD\02_Drawings\

240522 - Asset Records (Anglian Water), 240626 - Proposed SuDS Layout, 240710 - Landscape GA (LDA-D), A1-Wat-ISO-S-2023, OS (Cropped by LDA)

G. Proposed Drainage Modelling Summary

Proposed Development Runoff Calculations

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 546583 258531 TL 46583 58531
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	35.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
Project Otter Beehive Centre Cambridge	26/06/2024		
	Designed by:	Checked by:	Approved By:
	GJ	CP	CP
Report Details:	Company Address:		
Type: Inflow Summary Storm Phase: Phase	Waterman Group Pickfords Wharf, Clink Street, London SE1 9DG		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Block 1 Public Realm	Block 1 PP		Time of Concentration	0.048	100	0	100	0.048
Block 1 Roof	Block 1 RG		Time of Concentration	0.119	100	0	100	0.119
Block 2 Public Realm	Block 2 PP		Time of Concentration	0.109	100	0	100	0.109
Block 2 Public Realm (1)	Block 2 RG		Time of Concentration	0.043	100	0	100	0.043
Block 2 Roof	Block 2 RG		Time of Concentration	0.358	100	0	100	0.358
Block 3 & 4 Highway	Block 4 Tank		Time of Concentration	0.166	100	0	100	0.166
Block 3 Public Realm	Block 3 RG		Time of Concentration	0.138	100	0	100	0.138
Block 3 Roof	Block 3 Tank		Time of Concentration	0.476	100	0	100	0.476
Block 4 Public Realm	Block 4 PP		Time of Concentration	0.046	100	0	100	0.046
Block 4 Roof	Block 4 RG		Time of Concentration	0.203	100	0	100	0.203
Block 10 Public Realm	Block 10 RG		Time of Concentration	0.012	100	0	100	0.012
Block 10 Public Realm (1)	Highways RG (1)		Time of Concentration	0.005	100	0	100	0.005
Block 10 Roof	Block 10 RG		Time of Concentration	0.182	100	0	100	0.182
Northern Highway	Highways RG (2)		Time of Concentration	0.207	100	0	100	0.207
Northern Highway (1)	Block 10 RG		Time of Concentration	0.121	100	0	100	0.121
Northern Highway (2)	Bioretention (10)		Time of Concentration	0.010	100	0	100	0.010
TOTAL		**0.0**		**2.244**				**2.244**

Project:	Date:		
Project Otter Beehive Centre Cambridge	26/06/2024		
	Designed by:	Checked by:	Approved By:
	GJ	CP	CP
Report Details: Type: Junctions Storm Phase: Phase	Company Address: Waterman Group Pickfords Wharf, Clink Street, London SE1 9DG		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
MH5	Outlet	SW1.005	Hydro-Brake®
	Invert Level (m)	8.240	
	Design Depth (m)	1.000	
	Design Flow (L/s)	3.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☑	
	Unit Reference	SHE-0082-3000-1000-3000	
MH1	Outlet	SW1.001	Free Discharge
MH2	Outlet	SW1.003	Free Discharge
MH3	Outlet	SW6.003	Free Discharge
MH4	Outlet	SW6.004	Free Discharge

Block 3 RG

Type : Bioretention

Ponding Area

Exceedance Level (m)	11.071
Depth (m)	0.300
Base Level (m)	10.771
Top Area (m²)	149.02
Side Slope (1:X)	0.00
Base Area (m²)	149.02
Freeboard (mm)	100
Porosity (%)	100
Length (m)	38.408
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	128.571

Filter Area

Base Level (m)	8.771

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1000	35	50.0	Soil Type
	Storage	1000	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 3 Public Realm
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	SW1.001
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW1.002
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	84.577
Top Perimeter (m)	84.577

Block 2 RG.1 Type : Bioretention

Ponding Area

Exceedance Level (m)	10.000
Depth (m)	0.200
Base Level (m)	9.800
Top Area (m²)	174.001
Side Slope (1:X)	0.00
Base Area (m²)	174.001
Freeboard (mm)	100
Porosity (%)	100
Length (m)	40.674
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	103.368

Filter Area

Base Level (m)	8.350

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	950	35	50.0	Soil Type
	Storage	500	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	SW4.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW4.003
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	89.904
Top Perimeter (m)	89.904

Block 2 RG Type : Bioretention

Ponding Area

Exceedance Level (m)	10.400
Depth (m)	0.200
Base Level (m)	10.200
Top Area (m²)	467.17
Side Slope (1:X)	0.00
Base Area (m²)	467.17
Freeboard (mm)	100
Porosity (%)	100
Length (m)	109.384
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	341.776

Filter Area

Base Level (m)	8.300

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1000	35	50.0	Soil Type
	Storage	900	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 2 Public Realm (1)
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Block 2 Roof
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW5.000
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	227.311
Top Perimeter (m)	227.311

Highways RG (1)

Type : Bioretention

Ponding Area

Exceedance Level (m)	11.162
Depth (m)	0.200
Base Level (m)	10.962
Top Area (m²)	80.07
Side Slope (1:X)	0.00
Base Area (m²)	80.07
Freeboard (mm)	100
Porosity (%)	100
Length (m)	17.683
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	72.134

Filter Area

Base Level (m)	8.562

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1400	35	35.0	Soil Type
	Storage	1000	30	30.0	

Inlets

Inlet

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

Outlets

Outlet

Outgoing Connection	SW7.000
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	44.421
Top Perimeter (m)	44.421

Ponding Area

Exceedance Level (m)	11.562
Depth (m)	0.300
Base Level (m)	11.262
Top Area (m²)	668.72
Side Slope (1:X)	0.00
Base Area (m²)	668.72
Freeboard (mm)	100
Porosity (%)	100
Length (m)	67.751
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	618.579

Filter Area

Base Level (m)	9.062

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1200	35	50.0	Soil Type
	Storage	1000	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 10 Public Realm
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Block 10 Roof
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	SW6.000
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Inlet (2)

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

Outlets

Outlet

Outgoing Connection	SW6.001
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	155.242
Top Perimeter (m)	155.242

Highways RG Type : Bioretention

Ponding Area

Exceedance Level (m)	11.423
Depth (m)	0.400
Base Level (m)	11.023
Top Area (m²)	176.74
Side Slope (1:X)	0.00
Base Area (m²)	176.74
Freeboard (mm)	100
Porosity (%)	100
Length (m)	53.249
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	165.234

Filter Area

Base Level (m)	9.123

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1000	35	50.0	Soil Type
	Storage	900	30	500.0	

Inlets

Outlets

Outlet

Outgoing Connection	SW6.000
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	113.137
Top Perimeter (m)	113.137

Block 1 RG Type : Bioretention

Ponding Area

Exceedance Level (m)	10.500
Depth (m)	0.300
Base Level (m)	10.200
Top Area (m²)	321.23
Side Slope (1:X)	0.00
Base Area (m²)	321.23
Freeboard (mm)	100
Porosity (%)	100
Length (m)	65.078
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	245.752

Filter Area

Base Level (m)	8.500

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	900	35	50.0	Soil Type
	Storage	800	30	500.0	

Inlets

Inlet (1)

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

Outlets

Outlet

Outgoing Connection	SW3.000
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	140.029
Top Perimeter (m)	140.029

Bioretention (10)

Type : Bioretention

Ponding Area

Exceedance Level (m)	10.361
Depth (m)	0.100
Base Level (m)	10.261
Top Area (m²)	246.15
Side Slope (1:X)	0.00
Base Area (m²)	246.15
Freeboard (mm)	100
Porosity (%)	100
Length (m)	48.242
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	156.231

Filter Area

Base Level (m)	8.361

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1100	35	50.0	Soil Type
	Storage	800	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Northern Highway (2)
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	SW6.004
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW6.005
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	106.688
Top Perimeter (m)	106.688

Block 4 RG Type : Bioretention

Ponding Area

Exceedance Level (m)	11.135
Depth (m)	0.200
Base Level (m)	10.935
Top Area (m²)	445.25
Side Slope (1:X)	0.00
Base Area (m²)	445.25
Freeboard (mm)	100
Porosity (%)	100
Length (m)	80.023
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	342.350

Filter Area

Base Level (m)	8.935

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
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	1200	35	50.0	Soil Type
	Storage	800	30	500.0	

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Block 4 Roof
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW1.000
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	171.175
Top Perimeter (m)	171.175

Highways RG (2)

Type : Bioretention

Ponding Area

Exceedance Level (m)	10.000
Depth (m)	0.255
Base Level (m)	9.745
Top Area (m²)	1869.13
Side Slope (1:X)	0.00
Base Area (m²)	1869.13
Freeboard (mm)	100
Porosity (%)	100
Length (m)	136.150
Long. Slope (1:X)	500.00
Filtration Rate (m/hr)	50.0
Friction Scheme	Manning's n
n	0.03
Total Volume (m³)	1250.679

Filter Area

Base Level (m)	8.245

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
No. of Barrels	4
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	1000	35	50.0	Soil Type
	Storage	500	30	500.0	

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Northern Highway
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	SW1.003
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	SW3.001
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	SW4.003
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	SW5.000
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	SW6.005
Bypass Destination	(None)
Inlet Destination	Subsurface Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW1.004
Outlet Type	Free Discharge

Advanced

Ponding Area

Base Perimeter (m)	299.756
Top Perimeter (m)	299.756

Site Pond

Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	1.250
Base Level (m)	8.750
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.612
Total Volume (m³)	431.881

Depth (m)	Area (m²)	Volume (m³)
0.000	300.00	0.000
1.000	650.00	463.863

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	SW6.001
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW6.002
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	42.935
Friction Scheme	Manning's n
n	0.03

Block 1 PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	9.900
Depth (m)	1.500
Base Level (m)	8.400
Paving Layer Depth (mm)	400
Membrane Percolation (m/hr)	30.0
Porosity (%)	30
Length (m)	36.945
Long. Slope (1:X)	200.00
Width (m)	12.811
Total Volume (m³)	158.015

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 1 Public Realm
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	SW3.000
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW3.001
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	30.0

Block 4 PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	11.307
Depth (m)	1.800
Base Level (m)	9.507
Paving Layer Depth (mm)	300
Membrane Percolation (m/hr)	30.0
Porosity (%)	30
Length (m)	75.692
Long. Slope (1:X)	200.00
Width (m)	6.821
Total Volume (m³)	236.095

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
No. of Barrels	1
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 4 Public Realm
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW2.000
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	30.0

Block 2 PP

Type : Porous Paving

Dimensions

Exceedance Level (m)	10.100
Depth (m)	1.700
Base Level (m)	8.400
Paving Layer Depth (mm)	400
Membrane Percolation (m/hr)	30.0
Porosity (%)	30
Length (m)	122.649
Long. Slope (1:X)	500.00
Width (m)	9.524
Total Volume (m³)	479.851

Under Drain

Height Above Base (m)	0.000
Diameter (mm)	300
No. of Barrels	4
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Block 2 Public Realm
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	SW4.000
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW4.001
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	50.0

Block 3 Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.600
Base Level (m)	8.450
Number of Crates Long	63
Number of Crates Wide	48
Number of Crates High	1
Porosity (%)	100
Crate Length (m)	0.4
Crate Width (m)	0.4
Crate Height (m)	0.6
Total Volume (m^3)	291.254

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Block 3 Roof
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW4.000
Outlet Type	Free Discharge

Block 4 Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	11.000
Depth (m)	1.000
Base Level (m)	8.900
Number of Crates Long	60
Number of Crates Wide	35
Number of Crates High	2
Porosity (%)	100
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.5
Total Volume (m^3)	526.100

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	SW2.000 Block 3 & 4 Highway
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW2.001
Outlet Type	Free Discharge

Block 2 Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.600
Base Level (m)	8.380
Number of Crates Long	22
Number of Crates Wide	22
Number of Crates High	1
Porosity (%)	100
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.6
Total Volume (m^3)	73.620

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	SW4.001
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	SW4.002
Outlet Type	Free Discharge

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH6	FEH: 2 years: +0 %: 960 mins: Summer	9.810	8.200	8.226	0.026	3.0	0.000	0.000	3.0	179.445	OK
MH5	FEH: 2 years: +0 %: 960 mins: Summer	9.860	8.240	8.505	0.265	3.0	0.469	0.000	3.0	179.455	OK
MH1	FEH: 2 years: +0 %: 1440 mins: Summer	10.521	8.800	9.413	0.613	2.3	1.083	0.000	0.0	201.006	Surcharged
MH2	FEH: 2 years: +0 %: 120 mins: Summer	11.076	8.700	9.022	0.322	13.1	0.568	0.000	13.1	15.885	OK
MH3	FEH: 2 years: +0 %: 1440 mins: Summer	12.487	8.600	8.984	0.384	2.7	0.679	0.000	2.3	27.474	Surcharged
MH4	FEH: 2 years: +0 %: 1440 mins: Summer	11.298	8.400	8.984	0.584	2.3	1.033	0.000	0.0	22.272	Surcharged

FEH: 30 years: Increase Rainfall (%): +35: 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
MH6	FEH: 30 years: +35 %: 15 mins: Summer	9.810	8.200	8.226	0.026	3.0	0.000	0.000	3.0	1.932	OK
MH5	FEH: 30 years: +35 %: 360 mins: Summer	9.860	8.240	8.745	0.505	3.4	0.892	0.000	3.0	98.274	Surcharged
MH1	FEH: 30 years: +35 %: 1440 mins: Summer	10.521	8.800	9.735	0.935	5.6	1.652	0.000	0.0	260.282	Surcharged
MH2	FEH: 30 years: +35 %: 30 mins: Summer	11.076	8.700	9.142	0.442	55.7	0.780	0.000	55.5	43.479	Surcharged
MH3	FEH: 30 years: +35 %: 960 mins: Summer	12.487	8.600	9.257	0.657	2.9	1.162	0.000	2.7	63.620	Surcharged
MH4	FEH: 30 years: +35 %: 960 mins: Summer	11.298	8.400	9.257	0.857	2.8	1.515	0.000	2.8	57.944	Surcharged