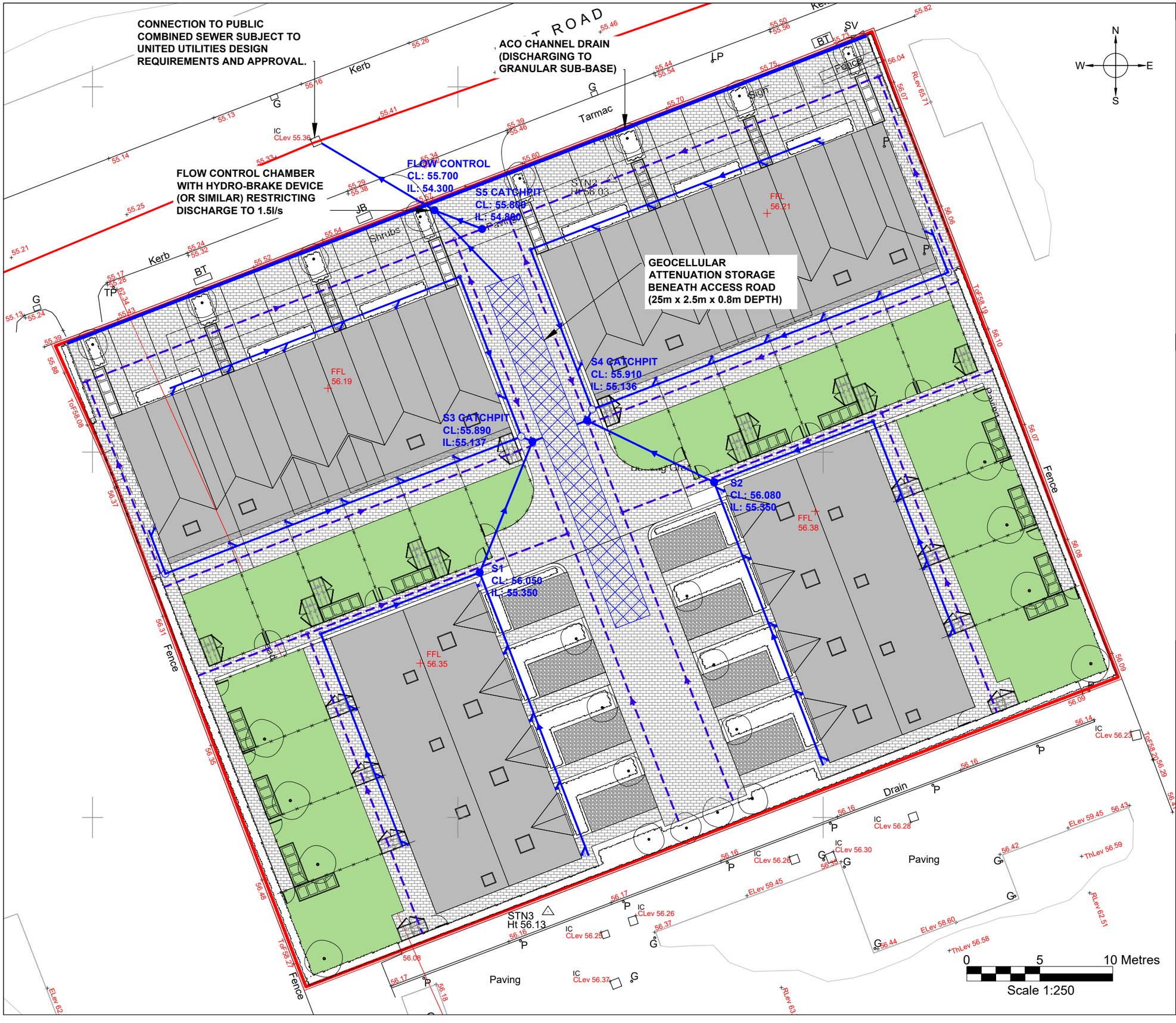


NOTES

1. RAINWATER BUTT TO BE INSTALLED VIA A DOWNPIPE DIVERTER AT REAR OF EACH PROPERTY.
2. ALL ELEVATIONS IN mAOD AND ALL DIMENSIONS IN mm UNLESS OTHERWISE STATED.
3. CONTROLLED OUTFLOW FROM THE DRAINAGE SYSTEM (PEAK DISCHARGE RATE: 1.5L/S) SHALL DISCHARGE TO PUBLIC SEWER , SUBJECT TO SURVEY AND UNITIED UTILITIES DESIGN REQUIREMENTS AND APPROVAL.
4. DRAINAGE COVER LEVELS AND INVERT LEVELS TO BE REVIEWED BY CONTRACTR WHEN FINAL SITE LEVELS & PUBLIC SEWER LEVEL CONFIRMED.
5. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BRITISH STANDARDS CODES OF PRACTICE BUILDING REGULATIONS AND WITH SEWERAGE SECTOR GUIDANCE.
6. CONCRETE PROTECTION SHALL BE PROVIDED TO ALL PIPES WITH LESS THAN 300MM COVER IN PEDESTRIAN AREAS, TO ALL PIPES WITH LESS THAN 600MM COVER IN PRIVATE DRIVEWAYS NOT USED BY COMMERCIAL VEHICLES, AND TO ALL PIPES WITH LESS THAN 1200MM COVER IN ROADS OR PRIVATE DRIVEWAYS USED BY COMMERCIAL VEHICLES.

REFERENCES:
- OLLIER SMURTHWAITE ARCHITECTS, A795_P_200-PROPOSED SITE PLAN, AUGUST 2024.
- UNITED UTILITIES , SEWER RECORDS, NS_0128_64_LONGSITE DRAINAGE_APPENDIX C, 01.08.24.

LEGEND

- APPLICATION SITE BOUNDARY
- PROPOSED SURFACE WATER DRAINAGE
- PERFORATED PIPES WITHIN PERMEABLE PAVING SUB-BASE
- EXISTING PUBLIC COMBINED SEWER (UNITED UTILITIES)

PROPOSED EXTERNAL SURFACES

- ROOF
- GARDENS
- PERMEABLE PAVING 500MM THICKNESS (MINIMUM) GRANULAR SUB-BASE WITH 150MM DIAMETER PERFORATED PIPEWORK
- PERMEABLE PLASTIC GRID BOUND GRAVEL 500MM THICKNESS (MINIMUM) GRANULAR SUB-BASE WITH 150MM DIAMETER PERFORATED PIPEWORK

EARTH ENVIRONMENTAL & GEOTECHNICAL LTD.

SITE
Longsight Bowling Club, Manchester (Ref: NS_0128_64)

PROJECT
Surface Water Drainage Strategy

DRAWING TITLE
Surface Water Drainage Layout Plan

DRAWING NUMBER	REVISION
001	0
SCALE 1:250 @ A3	DATE 11.09.2024

Nicola Sugg
Consultant Hydrogeologist & Hydrologist
T: 07866 374158 www.nsugg.co.uk



NOTES

References:
OLLIER SMURTHWAITE ARCHITECTS,
A795_P_200-PROPOSED SITE PLAN, AUGUST 2024.

LEGEND

APPLICATION SITE BOUNDARY

PROPOSED EXTERNAL SURFACES

ROOF

GARDENS

PERMEABLE PAVING

PERMEABLE PLASTIC GRID BOUND GRAVEL

N
W E
S

EARTH ENVIRONMENTAL & GEOTECHNICAL LTD.

SITE
Longsight Bowling Club, Manchester (Ref: NS_0128_64)

PROJECT
Surface Water Drainage Strategy

DRAWING TITLE
Area Contributing to Drainage System

DRAWING NUMBER	REVISION
002	0
SCALE 1:250 @ A3	DATE 05.09.2024

Nicola Sugg
Consultant Hydrogeologist & Hydrologist
T: 07866 374158 www.nsugg.co.uk

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Nicola Sugg
Site name:	Longsight Bowling Club
Site location:	East Road, Manchester

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.45405° N
Longitude:	2.19064° W
Reference:	2197300629
Date:	Sep 09 2024 09:39

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.2362

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	886	886
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	1.5	1.5
1 in 1 year (l/s):	1.31	1.31
1 in 30 years (l/s):	2.55	2.55
1 in 100 year (l/s):	3.12	3.12
1 in 200 years (l/s):	3.56	3.56

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	60.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.022	5.00	56.050	450	426.500	266.750	0.700
S2	0.022	5.00	56.080	450	442.540	272.960	0.730
S3 CATCHPIT	0.078	10.00	55.890	450	429.320	276.030	0.753
S4 CATCHPIT	0.078	10.00	55.910	450	434.190	277.930	0.774
ATTENUATION	0.000		55.850		429.110	284.120	1.300
S5 CATCHPIT	0.038	10.00	55.800	450	426.700	290.300	1.000
FLOW CONTROL	0.000		55.700	1200	423.440	291.500	1.400
PUBLIC SEWER	0.000		55.360	600	415.300	296.260	1.360

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S3 CATCHPIT	9.699	0.600	55.350	55.137	0.213	45.5	150	5.11	60.0
1.001	S3 CATCHPIT	ATTENUATION	8.093	0.600	55.137	54.976	0.161	50.3	150	10.09	60.0
2.000	S2	S4 CATCHPIT	9.717	0.600	55.350	55.136	0.214	45.4	150	5.11	60.0
2.001	S4 CATCHPIT	ATTENUATION	8.008	0.600	55.136	54.950	0.186	43.1	150	10.09	60.0
3.000	ATTENUATION	FLOW CONTROL	9.307	0.600	54.550	54.300	0.250	37.2	225	10.17	60.0
3.001	FLOW CONTROL	PUBLIC SEWER	9.430	0.600	54.300	54.000	0.300	31.4	225	10.23	60.0
4.000	S5 CATCHPIT	FLOW CONTROL	3.474	0.600	54.800	54.300	0.500	6.9	100	10.02	60.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.495	26.4	3.6	0.550	0.603	0.022	0.0	37	1.047
1.001	1.422	25.1	16.3	0.603	0.724	0.100	0.0	88	1.512
2.000	1.497	26.5	3.6	0.580	0.624	0.022	0.0	37	1.048
2.001	1.538	27.2	16.3	0.624	0.750	0.100	0.0	83	1.604
3.000	2.151	85.5	32.5	1.075	1.175	0.200	0.0	96	2.009
3.001	2.342	93.1	38.7	1.175	1.135	0.238	0.0	101	2.232
4.000	2.952	23.2	6.2	0.900	1.300	0.038	0.0	36	2.511

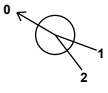
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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	9.699	45.5	150	Circular	56.050	55.350	0.550	55.890	55.137	0.603
1.001	8.093	50.3	150	Circular	55.890	55.137	0.603	55.850	54.976	0.724
2.000	9.717	45.4	150	Circular	56.080	55.350	0.580	55.910	55.136	0.624
2.001	8.008	43.1	150	Circular	55.910	55.136	0.624	55.850	54.950	0.750
3.000	9.307	37.2	225	Circular	55.850	54.550	1.075	55.700	54.300	1.175
3.001	9.430	31.4	225	Circular	55.700	54.300	1.175	55.360	54.000	1.135
4.000	3.474	6.9	100	Circular	55.800	54.800	0.900	55.700	54.300	1.300

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	450	Manhole	Adoptable	S3 CATCHPIT	450	Manhole	Adoptable
1.001	S3 CATCHPIT	450	Manhole	Adoptable	ATTENUATION		Junction	
2.000	S2	450	Manhole	Adoptable	S4 CATCHPIT	450	Manhole	Adoptable
2.001	S4 CATCHPIT	450	Manhole	Adoptable	ATTENUATION		Junction	
3.000	ATTENUATION		Junction		FLOW CONTROL	1200	Manhole	Adoptable
3.001	FLOW CONTROL	1200	Manhole	Adoptable	PUBLIC SEWER	600	Manhole	Adoptable
4.000	S5 CATCHPIT	450	Manhole	Adoptable	FLOW CONTROL	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	426.500	266.750	56.050	0.700	450				
						0	1.000	55.350	150
S2	442.540	272.960	56.080	0.730	450				
						0	2.000	55.350	150
S3 CATCHPIT	429.320	276.030	55.890	0.753	450		1	1.000	55.137	150
							0	1.001	55.137	150
S4 CATCHPIT	434.190	277.930	55.910	0.774	450		1	2.000	55.136	150
							0	2.001	55.136	150
ATTENUATION	429.110	284.120	55.850	1.300			1	2.001	54.950	150
							2	1.001	54.976	150
							0	3.000	54.550	225
S5 CATCHPIT	426.700	290.300	55.800	1.000	450				
						0	4.000	54.800	100
FLOW CONTROL	423.440	291.500	55.700	1.400	1200		1	4.000	54.300	100
							2	3.000	54.300	225
							0	3.001	54.300	225

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
PUBLIC SEWER	415.300	296.260	55.360	1.360	600	1	3.001	54.000	225



Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	0.0		

Storm Durations

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

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

Node FLOW CONTROL Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	54.300	Product Number	CTL-SHE-0053-1500-1400-1500
Design Depth (m)	1.400	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.5	Min Node Diameter (mm)	1200

Node S3 CATCHPIT Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.260	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	7.950	Inf Depth (m)	
Porosity	0.30	Length (m)	60.000		

Node S4 CATCHPIT Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.280	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	7.950	Inf Depth (m)	
Porosity	0.30	Length (m)	60.000		

Node S5 CATCHPIT Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	55.170	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	6.900	Inf Depth (m)	
Porosity	0.30	Length (m)	55.000		

Node ATTENUATION Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	54.550
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	62.5	0.0	0.800	62.5	0.0	0.801	0.0	0.0

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.13%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	S1	915	55.649	0.299	1.0	0.0476	0.0000	SURCHARGED
960 minute winter	S2	915	55.649	0.299	1.0	0.0476	0.0000	SURCHARGED
960 minute winter	S3 CATCHPIT	915	55.649	0.512	4.4	34.3530	0.0000	FLOOD RISK
960 minute winter	S4 CATCHPIT	915	55.649	0.513	4.4	31.4910	0.0000	FLOOD RISK
960 minute winter	ATTENUATION	915	55.649	1.099	6.4	47.5297	0.0000	FLOOD RISK
960 minute winter	S5 CATCHPIT	915	55.649	0.849	4.3	48.4432	0.0000	FLOOD RISK
960 minute winter	FLOW CONTROL	915	55.649	1.349	4.5	1.5259	0.0000	FLOOD RISK
15 minute summer	PUBLIC SEWER	1	54.000	0.000	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	S1	1.000	S3 CATCHPIT	1.0	0.328	0.036	0.1707	
960 minute winter	S2	2.000	S4 CATCHPIT	1.0	0.340	0.036	0.1711	
960 minute winter	S3 CATCHPIT	1.001	ATTENUATION	3.2	0.879	0.127	0.1425	
960 minute winter	S4 CATCHPIT	2.001	ATTENUATION	3.3	0.904	0.120	0.1410	
960 minute winter	ATTENUATION	3.000	FLOW CONTROL	4.2	0.157	0.049	0.3701	
960 minute winter	S5 CATCHPIT	4.000	FLOW CONTROL	-2.7	-0.351	-0.118	0.0272	
960 minute winter	FLOW CONTROL	Hydro-Brake®	PUBLIC SEWER	1.5				92.7

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