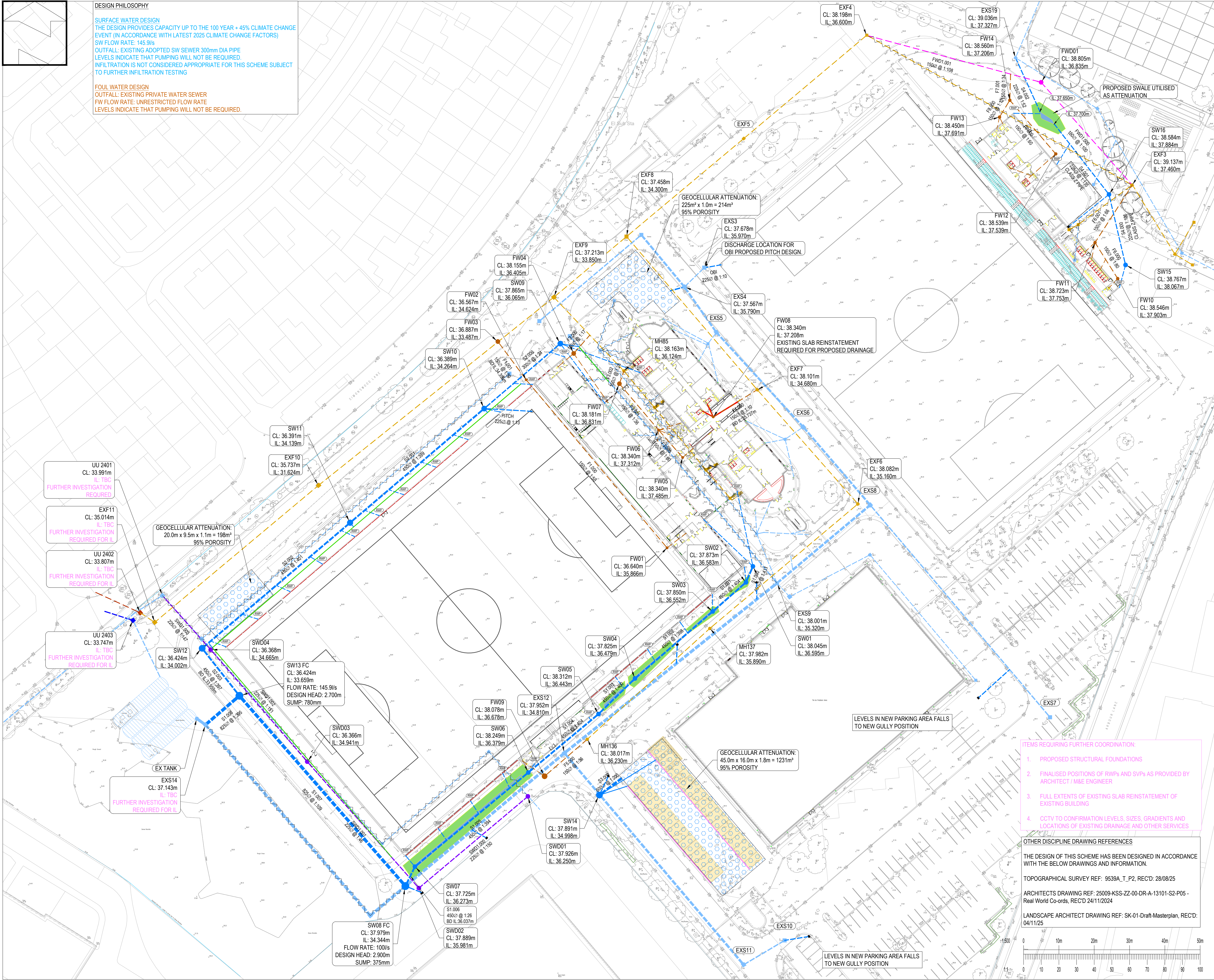


DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR + 45% CLIMATE CHANGE EVENT (IN ACCORDANCE WITH LATEST 2025 CLIMATE CHANGE FACTORS)
SW FLOW RATE: 145.9l/s
OUTFALL: EXISTING ADOPTED SW SEWER 300mm DIA PIPE
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.
INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME SUBJECT TO FURTHER INFILTRATION TESTING

FOUL WATER DESIGN
OUTFALL: EXISTING PRIVATE WATER SEWER
FW FLOW RATE: UNRESTRICTED FLOW RATE
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.



- GENERAL NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
 - FOR GENERAL NOTES REFER TO DRAWING.
- GENERAL NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN. ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
 - DO NOT SCALE THIS DRAWING. ALL DETAILS AND DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
 - ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
 - WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
 - ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
 - ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
 - OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

KEY

- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- EXISTING PRIVATE SURFACE WATER
- EXISTING PRIVATE FOUL WATER
- DIVERTED EXISTING PRIVATE SURFACE WATER
- DIVERTED EXISTING PRIVATE FOUL WATER
- EXISTING ADOPTED SURFACE WATER
- EXISTING ADOPTED FOUL WATER
- EXISTING DRAINAGE TO BE REMOVED
- PROPOSED SURFACE DRAINAGE CHANNEL
- PROPOSED SURFACE WATER ATTENUATION TANK
- PROPOSED PERMEABLE PAVING

DRAWING TO BE READ IN CONJUNCTION WITH PROPOSED DRAINAGE DETAILS

P02	STAGE 3 ISSUE	05/12/25	RIT	MB
P01	ISSUED FOR PLANNING (S2)	25/11/25	RIT	MB
Rev:	Description:	Date:	By:	Chkd:

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Civils & Structures - Transport Planning - Environmental - Infrastructure - Geotechnical - Conservation & Heritage - Principal Designer
Birmingham - Bristol - Cambridge - Cardiff - Douglas - Dublin - Edinburgh - Glasgow - Kendal - Leeds - Liverpool - London - Manchester - Nottingham

Status: STAGE 3

Project: **LIVERPOOL FC TRAINING CENTRE ACADEMY**

Dwg Title: **PROPOSED DRAINAGE**

Drawn By: RIT
Designed By: RIT
Checked By: JDB
Date: 25/11/2025
Scales @ A1: 1:500

Project No - Originator - Function - Spatial - Form - Discipline - Number
Revision

088269 - CUR - XX - XX - DR - C - 92000 P02

ITEMS REQUIRING FURTHER COORDINATION:

- PROPOSED STRUCTURAL FOUNDATIONS
- FINALISED POSITIONS OF RWP's AND SVP's AS PROVIDED BY ARCHITECT / M&E ENGINEER
- FULL EXTENTS OF EXISTING SLAB REINSTATEMENT OF EXISTING BUILDING
- CCTV TO CONFIRMATION LEVELS, SIZES, GRADIENTS AND LOCATIONS OF EXISTING DRAINAGE AND OTHER SERVICES

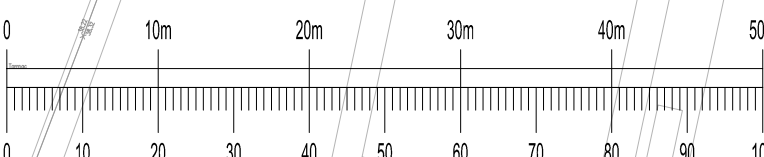
OTHER DISCIPLINE DRAWING REFERENCES

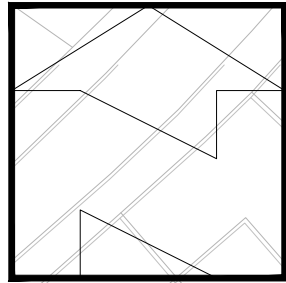
THE DESIGN OF THIS SCHEME HAS BEEN DESIGNED IN ACCORDANCE WITH THE BELOW DRAWINGS AND INFORMATION.

TOPOGRAPHICAL SURVEY REF: 9539A_T_P2, REC'D: 28/08/25

ARCHITECTS DRAWING REF: 25009-KSS-ZZ-00-DR-A-13101-S2-P05 - Real World Co-ords, REC'D 24/11/2024

LANDSCAPE ARCHITECT DRAWING REF: SK-01-Draft-Masterplan, REC'D: 04/11/25

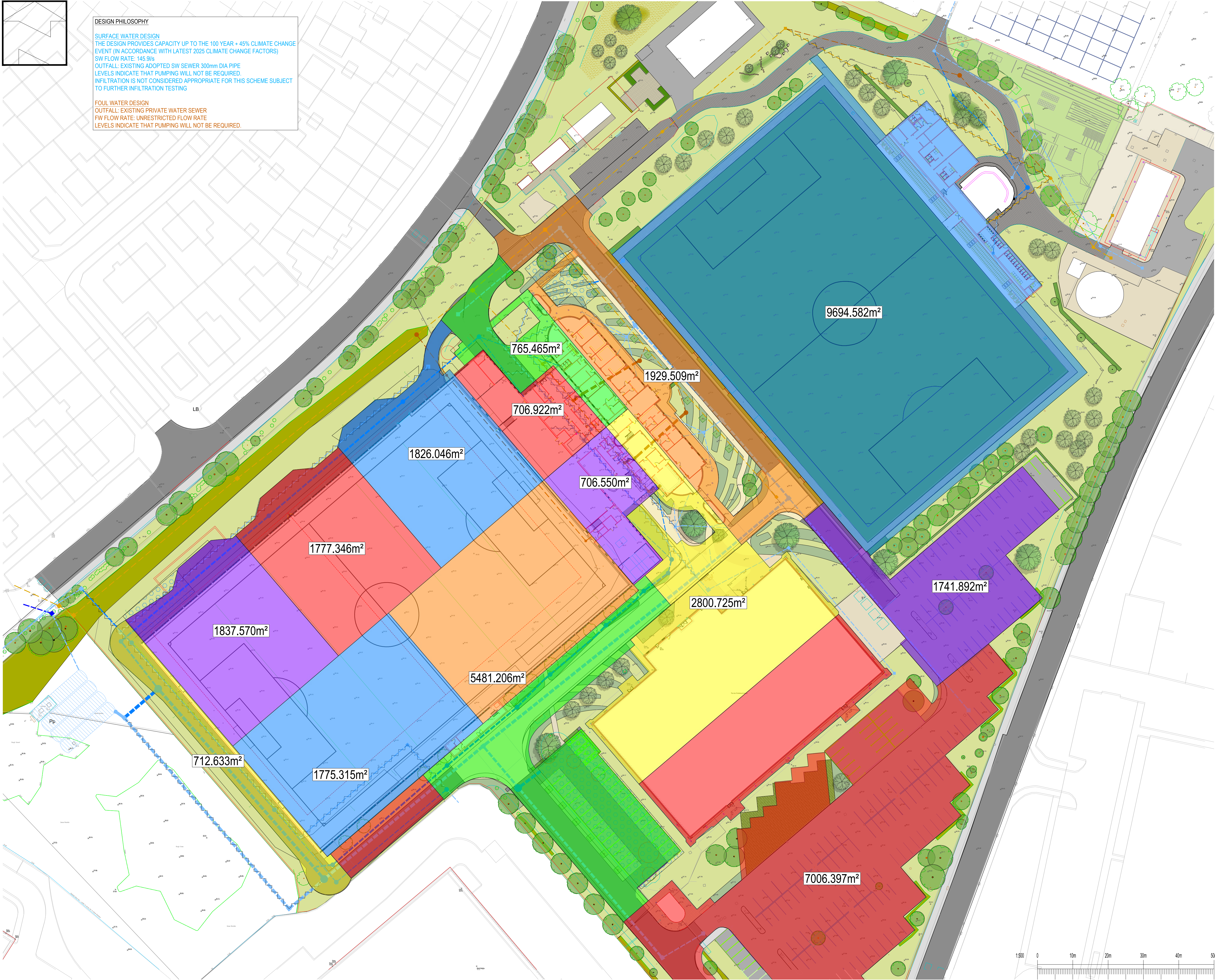




DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR + 45% CLIMATE CHANGE EVENT (IN ACCORDANCE WITH LATEST 2025 CLIMATE CHANGE FACTORS)
SW FLOW RATE: 145.9l/s
OUTFALL: EXISTING ADOPTED SW SEWER 300mm DIA PIPE
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.
INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME SUBJECT TO FURTHER INFILTRATION TESTING

FOUL WATER DESIGN
OUTFALL: EXISTING PRIVATE WATER SEWER
FW FLOW RATE: UNRESTRICTED FLOW RATE
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED.



GENERAL NOTES:

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KEY

- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- EXISTING PRIVATE SURFACE WATER
- EXISTING PRIVATE FOUL WATER
- EXISTING ADOPTED SURFACE WATER
- EXISTING ADOPTED FOUL WATER
- EXISTING DRAINAGE TO BE REMOVED
- PROPOSED SURFACE WATER ATTENUATION TANK

P01	ISSUED FOR PLANNING (S2)	25/11/25	RIT	MB
Rev:	Description:	Date:	By:	Chkd:



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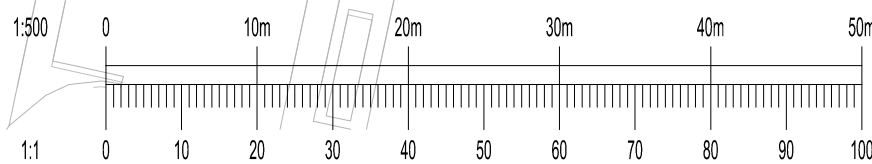
Status: **SUITABLE FOR INFORMATION** **S2**

Project: **LIVERPOOL FC TRAINING CENTRE ACADEMY**

Dig Title: **PROPOSED DRAINAGE CATCHMENTS**

Drawn By	Designed By	Checked By
RIT	RIT	JDB
Date	25/11/2025	Scales @ A1
1:500		
Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision	

088269 - CUR - XX - XX - DR - C - 92500 P01



Curtins		Curtins Consulting Ltd	Network: SW Veronika Olchowski-Mrozik 18/12/2025		Page 1		
Design Settings							
Rainfall Methodology FSR				Maximum Time of Concentration (mins) 30.00			
Return Period (years) 2				Maximum Rainfall (mm/hr) 50.0			
Additional Flow (%) 0				Minimum Velocity (m/s) 1.00			
FSR Region England and Wales				Connection Type Level Soffits			
M5-60 (mm) 20.000				Minimum Backdrop Height (m) 0.200			
Ratio-R 0.400				Preferred Cover Depth (m) 1.200			
CV 1.000				Include Intermediate Ground ✓			
Time of Entry (mins) 5.00				Enforce best practice design rules x			
Nodes							
Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1		5.00	37.249	1500	342310.909	398548.369	1.109
2			37.503	1500	342339.773	398572.796	1.703
3			37.567	1500	342351.985	398558.055	1.777
4			37.734	1500	342361.025	398545.186	2.024
5			37.901	1500	342385.596	398518.398	2.231
6	0.171	5.00	38.208	1500	342455.465	398436.212	1.868
7	0.193	5.00	38.095	1500	342404.570	398496.303	2.675
8	0.442	5.00	38.001	1500	342378.175	398474.195	2.681
9	0.664	5.00	37.490	1500	342368.731	398366.140	1.890
SW14	0.085	5.00	37.891	1500	342327.904	398414.195	2.893
11			37.952	1500	342317.996	398426.083	3.142
SW1	0.071	5.00	38.045	900	342371.361	398478.938	1.450
SW2	0.239	5.00	37.873	900	342369.390	398474.414	1.290
SW3			37.850	900	342359.967	398466.161	1.298
SW4			37.825	900	342337.969	398447.190	1.346
SW5			38.312	900	342327.652	398437.123	1.869
SW6			38.250	900	342307.781	398420.581	1.871
SW7	0.270	5.00	37.935	900	342275.406	398392.462	1.662
SW8			37.979	2100	342272.980	398388.421	3.635
SW9	0.071	5.00	37.865	1200	342316.838	398542.010	1.800
SW10	0.183	5.00	36.389	1200	342295.282	398523.609	2.125
SW11	0.178	5.00	36.391	1350	342257.324	398491.295	2.252
SW12	0.184	5.00	36.424	1500	342215.447	398455.737	2.422
SW13	0.071	5.00	36.424	1800	342225.998	398442.299	2.765
25			37.143	1500	342216.379	398434.079	4.167
26			37.067	1500	342213.950	398435.824	6.647
26_OUT			33.747	1200	342195.872	398463.649	1.487
SW15	0.082	5.00	38.584	900	342472.233	398584.181	0.697
SW16			38.400	900	342454.849	398606.348	0.750
28_OUT			39.036	1500	342445.724	398622.995	1.709
EXS3	0.924	5.00	37.680	1500	342357.587	398563.523	1.650
Flow+ v15.0 Copyright © 1988-2025 Causeway Technologies Ltd							

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	37.813	0.600	36.140	35.800	0.340	111.2	300	5.42	50.0
1.001	2	3	19.142	0.600	35.800	35.790	0.010	1914.2	525	6.06	50.0
1.003	3	4	10.746	0.600	35.790	35.710	0.080	134.3	525	6.15	50.0
1.004	4	5	36.350	0.600	35.710	35.670	0.040	908.8	525	6.98	50.0
1.005	5	7	29.124	0.600	35.670	35.420	0.250	116.5	525	7.21	50.0
2.000	6	7	78.748	0.600	36.340	35.420	0.920	85.6	300	5.77	50.0
2.001	7	8	34.431	0.600	35.420	35.320	0.100	344.3	600	7.97	50.0
1.006	8	11	77.047	0.600	35.320	34.810	0.510	151.1	750	8.53	50.0
4.000	9	SW14	63.057	0.600	35.600	34.998	0.602	104.7	600	5.44	50.0
4.001	SW14	11	15.476	0.600	34.998	34.960	0.038	407.3	600	5.66	50.0
1.007	11	SW8	58.693	0.600	34.810	34.419	0.391	150.0	750	8.96	50.0
5.000	SW1	SW2	4.935	0.600	36.595	36.583	0.012	400.0	450	5.08	50.0
5.001	SW2	SW3	12.526	0.600	36.583	36.552	0.031	400.0	450	5.29	50.0
5.002	SW3	SW4	29.048	0.600	36.552	36.479	0.073	400.0	450	5.77	50.0
5.003	SW4	SW5	14.415	0.600	36.479	36.443	0.036	400.4	450	6.01	50.0
5.004	SW5	SW6	25.855	0.600	36.443	36.379	0.064	404.0	450	6.43	50.0
5.005	SW6	SW7	42.881	0.600	36.379	36.273	0.106	404.5	450	7.15	50.0
5.006	SW7	SW8	4.713	0.600	36.273	36.037	0.236	20.0	450	7.16	50.0
1.008	SW8	SW13	71.485	0.600	34.344	33.688	0.656	109.0	825	9.38	50.0
6.000	SW9	SW10	28.342	0.600	36.065	34.889	1.176	24.1	300	5.15	50.0
6.001	SW10	SW11	49.850	0.600	34.264	34.139	0.125	400.0	525	5.89	50.0
6.002	SW11	SW12	54.937	0.600	34.139	34.002	0.137	400.0	525	6.72	50.0
6.003	SW12	SW13	17.085	0.600	34.002	33.959	0.043	400.0	525	6.97	50.0
1.009	SW13	25	12.653	0.600	33.659	33.627	0.032	400.0	825	9.52	50.0

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	1.490	105.3	0.0	0.809	1.403	0.000	0.0	0	0.000
1.001	0.503	108.8	0.0	1.178	1.252	0.000	0.0	0	0.000
1.003	1.931	417.9	0.0	1.252	1.499	0.000	0.0	0	0.000
1.004	0.735	159.0	0.0	1.499	1.706	0.000	0.0	0	0.000
1.005	2.074	449.0	0.0	1.706	2.150	0.000	0.0	0	0.000
2.000	1.700	120.2	30.9	1.568	2.375	0.171	0.0	103	1.432
2.001	1.306	369.4	232.7	2.075	2.081	1.288	0.0	346	1.377
1.006	2.274	1004.7	312.6	1.931	2.392	1.730	0.0	286	2.020
4.000	2.379	672.6	120.0	1.290	2.293	0.664	0.0	170	1.819
4.001	1.200	339.3	135.3	2.293	2.392	0.749	0.0	263	1.135
1.007	2.282	1008.3	448.0	2.392	2.810	2.479	0.0	350	2.218
5.000	1.010	160.7	12.8	1.000	0.840	0.071	0.0	85	0.611
5.001	1.010	160.7	56.0	0.840	0.848	0.310	0.0	183	0.923
5.002	1.010	160.7	56.0	0.848	0.896	0.310	0.0	183	0.923
5.003	1.010	160.6	56.0	0.896	1.419	0.310	0.0	183	0.923
5.004	1.005	159.8	56.0	1.419	1.421	0.310	0.0	183	0.919
5.005	1.004	159.7	56.0	1.421	1.212	0.310	0.0	183	0.918
5.006	4.561	725.5	104.8	1.212	1.492	0.580	0.0	115	3.289
1.008	2.843	1519.9	552.8	2.810	1.911	3.059	0.0	343	2.628
6.000	3.215	227.3	12.8	1.500	1.200	0.071	0.0	48	1.758
6.001	1.114	241.0	45.9	1.600	1.727	0.254	0.0	154	0.865
6.002	1.114	241.0	78.1	1.727	1.897	0.432	0.0	205	0.998
6.003	1.114	241.0	111.3	1.897	1.940	0.616	0.0	250	1.092
1.009	1.478	790.1	676.9	1.940	2.691	3.746	0.0	592	1.650

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)
1.010	25	26	2.991	0.600	32.976	30.420	2.556	1.2	750	9.52	50.0
1.011	26	26_OUT	33.182	0.600	32.591	32.260	0.331	100.2	300	9.87	50.0
7.000	SW15	SW16	28.171	0.600	37.887	37.700	0.187	150.6	225	5.44	50.0
7.001	SW16	28_OUT	18.984	0.600	37.650	37.327	0.323	58.8	225	5.63	50.0
2.000_1	EXS3	7	82.012	0.600	36.030	35.970	0.060	1366.9	450	7.53	50.0

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)
1.010	25.977	11476.1	676.9	3.417	5.897	3.746	0.0	121	14.590
1.011	1.570	111.0	676.9	4.176	1.187	3.746	0.0	300	1.590
7.000	1.063	42.3	14.8	0.472	0.475	0.082	0.0	92	0.971
7.001	1.709	67.9	14.8	0.525	1.484	0.082	0.0	71	1.370
2.000_1	0.541	86.0	167.0	1.200	1.675	0.924	0.0	450	0.548

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	37.813	111.2	300	Circular	37.249	36.140	0.809	37.503	35.800	1.403
1.001	19.142	1914.2	525	Circular	37.503	35.800	1.178	37.567	35.790	1.252
1.003	10.746	134.3	525	Circular	37.567	35.790	1.252	37.734	35.710	1.499
1.004	36.350	908.8	525	Circular	37.734	35.710	1.499	37.901	35.670	1.706
1.005	29.124	116.5	525	Circular	37.901	35.670	1.706	38.095	35.420	2.150
2.000	78.748	85.6	300	Circular	38.208	36.340	1.568	38.095	35.420	2.375
2.001	34.431	344.3	600	Circular	38.095	35.420	2.075	38.001	35.320	2.081
1.006	77.047	151.1	750	Circular	38.001	35.320	1.931	37.952	34.810	2.392
4.000	63.057	104.7	600	Circular	37.490	35.600	1.290	37.891	34.998	2.293
4.001	15.476	407.3	600	Circular	37.891	34.998	2.293	37.952	34.960	2.392
1.007	58.693	150.0	750	Circular	37.952	34.810	2.392	37.979	34.419	2.810
5.000	4.935	400.0	450	Circular	38.045	36.595	1.000	37.873	36.583	0.840
5.001	12.526	400.0	450	Circular	37.873	36.583	0.840	37.850	36.552	0.848
5.002	29.048	400.0	450	Circular	37.850	36.552	0.848	37.825	36.479	0.896
5.003	14.415	400.4	450	Circular	37.825	36.479	0.896	38.312	36.443	1.419

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1500	Manhole	Adoptable	2	1500	Manhole	Adoptable
1.001	2	1500	Manhole	Adoptable	3	1500	Manhole	Adoptable
1.003	3	1500	Manhole	Adoptable	4	1500	Manhole	Adoptable
1.004	4	1500	Manhole	Adoptable	5	1500	Manhole	Adoptable
1.005	5	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.000	6	1500	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.001	7	1500	Manhole	Adoptable	8	1500	Manhole	Adoptable
1.006	8	1500	Manhole	Adoptable	11	1500	Manhole	Adoptable
4.000	9	1500	Manhole	Adoptable	SW14	1500	Manhole	Adoptable
4.001	SW14	1500	Manhole	Adoptable	11	1500	Manhole	Adoptable
1.007	11	1500	Manhole	Adoptable	SW8	2100	Manhole	Adoptable
5.000	SW1	900	Manhole	Adoptable	SW2	900	Manhole	Adoptable
5.001	SW2	900	Manhole	Adoptable	SW3	900	Manhole	Adoptable
5.002	SW3	900	Manhole	Adoptable	SW4	900	Manhole	Adoptable
5.003	SW4	900	Manhole	Adoptable	SW5	900	Manhole	Adoptable

Node SW8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	34.344	Product Number	CTL-SHE-0369-1000-2900-1000
Design Depth (m)	2.900	Min Outlet Diameter (m)	0.450
Design Flow (l/s)	100.0	Min Node Diameter (mm)	0

Node SW13 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	33.659	Product Number	CTL-SHE-0440-1450-2700-1450
Design Depth (m)	2.700	Min Outlet Diameter (m)	0.500
Design Flow (l/s)	145.0	Min Node Diameter (mm)	0

Node SW14 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.998
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	160

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	720.0	720.0	1.800	720.0	891.2	1.801	0.0	891.2

Node EXS3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	36.030
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	15

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	225.0	225.0	1.000	225.0	278.2	1.001	0.0	278.2

Node SW12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	34.002
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	40

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	190.0	190.0	1.100	190.0	243.7	1.101	0.0	243.7

Node SW16 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	0

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	5.3	5.3	0.750	48.5	50.2	0.751	0.0	50.2

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2	1	35.800	0.000	0.0	0.0000	0.0000	OK
15 minute summer	3	1	35.790	0.000	0.0	0.0000	0.0000	OK
15 minute summer	4	1	35.710	0.000	0.0	0.0000	0.0000	OK
30 minute summer	5	20	35.672	0.002	0.0	0.0040	0.0000	OK
15 minute summer	6	10	36.456	0.116	39.5	0.4159	0.0000	OK
30 minute summer	7	19	35.671	0.251	126.8	0.8048	0.0000	OK
15 minute summer	8	10	35.545	0.225	210.1	1.1389	0.0000	OK
15 minute summer	9	9	35.861	0.261	153.4	2.2948	0.0000	OK
60 minute summer	SW14	49	35.251	0.253	268.8	173.4304	0.0000	OK
15 minute summer	11	13	35.370	0.560	242.8	0.9897	0.0000	OK
15 minute summer	SW1	11	36.818	0.223	16.4	0.3599	0.0000	OK
15 minute summer	SW2	11	36.817	0.234	71.2	1.0147	0.0000	OK
15 minute summer	SW3	11	36.775	0.223	69.8	0.1421	0.0000	OK
15 minute summer	SW4	11	36.710	0.231	69.7	0.1469	0.0000	OK
15 minute summer	SW5	11	36.664	0.221	69.5	0.1403	0.0000	OK
15 minute summer	SW6	11	36.587	0.208	68.8	0.1321	0.0000	OK
15 minute summer	SW7	11	36.438	0.165	127.0	0.6422	0.0000	OK
30 minute summer	SW8	19	35.395	1.051	179.9	3.6409	0.0000	SURCHARGED
15 minute summer	SW9	10	36.120	0.055	16.4	0.1060	0.0000	OK
15 minute summer	SW10	10	34.439	0.175	58.5	0.4986	0.0000	OK
15 minute summer	SW11	11	34.367	0.228	98.3	0.6880	0.0000	OK
60 minute summer	SW12	42	34.318	0.316	93.8	58.1631	0.0000	OK
60 minute summer	SW13	42	34.317	0.658	132.2	2.0131	0.0000	OK
60 minute summer	25	43	33.060	0.084	130.2	0.1475	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	0.0	0.000	0.000	0.0000	
15 minute summer	2	1.001	3	0.0	0.000	0.000	0.0000	
15 minute summer	3	1.003	4	0.0	0.000	0.000	0.0000	
15 minute summer	4	1.004	5	0.0	0.000	0.000	0.0001	
30 minute summer	5	1.005	7	0.0	-0.001	0.000	1.4815	
15 minute summer	6	2.000	7	38.5	0.982	0.320	3.3919	
30 minute summer	7	2.001	8	127.8	1.279	0.346	3.5668	
15 minute summer	8	1.006	11	207.3	1.699	0.206	17.4658	
15 minute summer	9	4.000	SW14	159.5	2.946	0.237	3.8753	
60 minute summer	SW14	4.001	11	-165.8	-1.597	-0.489	1.9213	
15 minute summer	11	1.007	SW8	146.1	0.654	0.145	23.2673	
15 minute summer	SW1	5.000	SW2	15.9	0.198	0.099	0.3983	
15 minute summer	SW2	5.001	SW3	69.8	0.872	0.435	1.0125	
15 minute summer	SW3	5.002	SW4	69.7	0.881	0.434	2.3305	
15 minute summer	SW4	5.003	SW5	69.5	0.874	0.433	1.1472	
15 minute summer	SW5	5.004	SW6	68.8	0.932	0.430	1.9223	
15 minute summer	SW6	5.005	SW7	70.6	1.204	0.442	2.6633	
15 minute summer	SW7	5.006	SW8	125.8	2.850	0.173	0.2088	
30 minute summer	SW8	1.008	SW13	99.9	0.606	0.066	17.2707	
15 minute summer	SW9	6.000	SW10	16.2	1.857	0.071	0.2476	
15 minute summer	SW10	6.001	SW11	57.5	0.755	0.238	3.8017	
15 minute summer	SW11	6.002	SW12	98.4	1.590	0.408	4.4370	
60 minute summer	SW12	6.003	SW13	34.9	0.698	0.145	2.5029	
60 minute summer	SW13	1.009	25	130.2	1.110	0.165	1.4858	
60 minute summer	25	1.010	26	130.1	0.974	0.011	0.6980	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	26	43	33.061	2.641	130.1	4.6665	0.0000	SURCHARGED
60 minute summer	26_OUT	43	32.531	0.271	130.1	0.0000	0.0000	OK
15 minute summer	SW15	10	37.995	0.108	19.0	0.3222	0.0000	OK
15 minute summer	SW16	11	37.734	0.084	18.5	0.6995	0.0000	OK
15 minute summer	28_OUT	11	37.407	0.080	18.5	0.0000	0.0000	OK
60 minute summer	EXS3	38	36.328	0.298	141.2	67.5751	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)
60 minute summer	26	1.011	26_OUT	130.1	1.849	1.173	2.2797	574.5
15 minute summer	SW15	7.000	SW16	18.5	1.016	0.438	0.5133	
15 minute summer	SW16	7.001	28_OUT	18.5	1.420	0.272	0.2470	8.2
60 minute summer	EXS3	2.000_1	7	76.5	0.870	0.890	7.1992	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
15 minute summer	2	15	35.811	0.011	0.4	0.0194	0.0000	OK
15 minute summer	3	13	35.833	0.043	4.1	0.0758	0.0000	OK
15 minute summer	4	13	35.836	0.126	12.2	0.2222	0.0000	OK
15 minute summer	5	12	35.824	0.154	17.3	0.2729	0.0000	OK
15 minute summer	6	10	36.508	0.168	75.0	0.6035	0.0000	OK
15 minute summer	7	12	35.822	0.402	267.1	1.2898	0.0000	OK
60 minute summer	8	60	35.727	0.407	357.4	2.0599	0.0000	OK
15 minute summer	9	9	35.945	0.345	291.2	3.0376	0.0000	OK
60 minute summer	SW14	61	35.727	0.729	620.2	500.5250	0.0000	SURCHARGED
60 minute summer	11	61	35.726	0.916	425.8	1.6194	0.0000	SURCHARGED
15 minute summer	SW1	11	36.952	0.357	31.2	0.5771	0.0000	OK
15 minute summer	SW2	11	36.951	0.368	135.1	1.5974	0.0000	OK
15 minute summer	SW3	11	36.904	0.352	132.3	0.2240	0.0000	OK
15 minute summer	SW4	11	36.833	0.354	130.6	0.2252	0.0000	OK
15 minute summer	SW5	11	36.778	0.335	130.2	0.2128	0.0000	OK
15 minute summer	SW6	11	36.691	0.312	129.7	0.1983	0.0000	OK
15 minute summer	SW7	11	36.525	0.252	240.9	0.9776	0.0000	OK
60 minute summer	SW8	61	35.723	1.379	164.2	4.7763	0.0000	SURCHARGED
15 minute summer	SW9	10	36.142	0.077	31.2	0.1475	0.0000	OK
60 minute summer	SW10	43	34.563	0.299	73.8	0.8525	0.0000	OK
60 minute summer	SW11	44	34.563	0.424	124.8	1.2773	0.0000	OK
60 minute summer	SW12	44	34.562	0.560	168.9	103.0006	0.0000	SURCHARGED
60 minute summer	SW13	43	34.561	0.902	158.4	2.7585	0.0000	SURCHARGED
60 minute summer	25	51	33.215	0.239	143.2	0.4231	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	0.0	0.000	0.000	0.0151	
15 minute summer	2	1.001	3	-0.4	-0.133	-0.004	0.0802	
15 minute summer	3	1.003	4	-4.1	-0.183	-0.010	0.2574	
15 minute summer	4	1.004	5	-12.2	0.391	-0.077	1.5358	
15 minute summer	5	1.005	7	21.0	0.248	0.047	3.3532	
15 minute summer	6	2.000	7	73.7	1.179	0.613	4.3676	
15 minute summer	7	2.001	8	263.5	1.624	0.713	6.5036	
60 minute summer	8	1.006	11	355.7	1.452	0.354	26.3479	
15 minute summer	9	4.000	SW14	301.8	3.241	0.449	8.1034	
60 minute summer	SW14	4.001	11	-409.3	-2.006	-1.206	4.3592	
60 minute summer	11	1.007	SW8	99.0	0.653	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	30.2	0.224	0.188	0.6754	
15 minute summer	SW2	5.001	SW3	132.3	1.003	0.823	1.7024	
15 minute summer	SW3	5.002	SW4	130.6	1.002	0.813	3.8767	
15 minute summer	SW4	5.003	SW5	130.2	1.004	0.811	1.8758	
15 minute summer	SW5	5.004	SW6	129.7	1.064	0.811	3.1495	
15 minute summer	SW6	5.005	SW7	130.8	1.383	0.819	4.4672	
15 minute summer	SW7	5.006	SW8	239.9	3.241	0.331	0.3493	
60 minute summer	SW8	1.008	SW13	100.6	0.606	0.066	23.0720	
15 minute summer	SW9	6.000	SW10	30.9	2.226	0.136	0.3933	
60 minute summer	SW10	6.001	SW11	73.1	0.753	0.303	7.8202	
60 minute summer	SW11	6.002	SW12	115.4	1.050	0.479	11.0679	
60 minute summer	SW12	6.003	SW13	51.4	0.689	0.213	3.6909	
60 minute summer	SW13	1.009	25	143.2	1.138	0.181	1.5947	
60 minute summer	25	1.010	26	259.6	1.128	0.023	0.8396	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	26	49	33.240	2.820	238.5	4.9834	0.0000	SURCHARGED
60 minute summer	26_OUT	44	32.539	0.279	144.2	0.0000	0.0000	OK
15 minute summer	SW15	10	38.052	0.165	36.0	0.4940	0.0000	OK
15 minute summer	SW16	11	37.772	0.122	35.1	1.1590	0.0000	OK
15 minute summer	28_OUT	11	37.441	0.114	35.0	0.0000	0.0000	OK
30 minute summer	EXS3	21	36.537	0.507	362.1	114.9866	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	26	1.011	26_OUT	143.9	2.044	1.297	2.3006	1114.1
15 minute summer	SW15	7.000	SW16	35.1	1.166	0.831	0.8475	
15 minute summer	SW16	7.001	28_OUT	35.0	1.660	0.515	0.4003	15.5
30 minute summer	EXS3	2.000_1	7	169.8	1.157	1.973	10.9269	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	114	36.197	0.057	0.8	0.1004	0.0000	OK
120 minute winter	2	116	36.197	0.397	7.5	0.7008	0.0000	OK
120 minute winter	3	116	36.196	0.406	10.2	0.7177	0.0000	OK
120 minute summer	4	106	36.196	0.486	16.7	0.8596	0.0000	OK
120 minute winter	5	114	36.196	0.526	22.5	0.9299	0.0000	SURCHARGED
15 minute summer	6	11	36.571	0.231	105.0	0.8299	0.0000	OK
120 minute winter	7	114	36.196	0.776	206.8	2.4917	0.0000	SURCHARGED
120 minute winter	8	114	36.194	0.874	277.6	4.4275	0.0000	SURCHARGED
120 minute winter	9	116	36.194	0.594	119.8	5.2195	0.0000	OK
120 minute winter	SW14	116	36.193	1.195	394.1	820.4692	0.0000	SURCHARGED
120 minute winter	11	116	36.193	1.383	277.6	2.4432	0.0000	SURCHARGED
15 minute summer	SW1	11	37.179	0.584	43.6	0.9435	0.0000	SURCHARGED
15 minute summer	SW2	11	37.177	0.594	187.1	2.5776	0.0000	SURCHARGED
15 minute summer	SW3	11	37.103	0.551	182.0	0.3504	0.0000	SURCHARGED
15 minute summer	SW4	11	36.976	0.497	182.0	0.3162	0.0000	SURCHARGED
15 minute summer	SW5	11	36.898	0.455	182.0	0.2894	0.0000	SURCHARGED
15 minute summer	SW6	11	36.791	0.412	181.8	0.2619	0.0000	OK
15 minute summer	SW7	11	36.594	0.321	339.1	1.2480	0.0000	OK
240 minute summer	SW8	208	36.220	1.876	154.3	6.4977	0.0000	SURCHARGED
15 minute summer	SW9	10	36.157	0.092	43.6	0.1763	0.0000	OK
60 minute summer	SW10	46	34.837	0.573	103.4	1.6340	0.0000	SURCHARGED
60 minute summer	SW11	46	34.836	0.697	164.5	2.1008	0.0000	SURCHARGED
60 minute summer	SW12	47	34.835	0.833	217.3	153.0723	0.0000	SURCHARGED
60 minute summer	SW13	47	34.833	1.174	165.4	3.5894	0.0000	SURCHARGED
120 minute summer	25	82	33.243	0.267	145.0	0.4712	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)
120 minute winter	1	1.000	2	-0.8	-0.019	-0.008	1.5064	
120 minute winter	2	1.001	3	-7.5	-0.301	-0.069	3.3914	
120 minute winter	3	1.003	4	-10.2	-0.208	-0.024	2.0851	
120 minute summer	4	1.004	5	-16.7	-0.193	-0.105	7.7206	
120 minute winter	5	1.005	7	-22.5	-0.129	-0.050	6.2897	
15 minute summer	6	2.000	7	101.5	1.515	0.844	5.0617	
120 minute winter	7	2.001	8	197.9	1.465	0.536	9.6984	
120 minute winter	8	1.006	11	269.0	1.326	0.268	33.9100	
120 minute winter	9	4.000	SW14	119.8	1.806	0.178	17.7471	
120 minute winter	SW14	4.001	11	-259.0	-1.118	-0.763	4.3592	
120 minute winter	11	1.007	SW8	99.0	0.654	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	41.7	0.263	0.259	0.7819	
15 minute summer	SW2	5.001	SW3	182.0	1.149	1.133	1.9847	
15 minute summer	SW3	5.002	SW4	182.0	1.149	1.133	4.6025	
15 minute summer	SW4	5.003	SW5	182.0	1.149	1.133	2.2839	
15 minute summer	SW5	5.004	SW6	181.8	1.161	1.137	4.0133	
15 minute summer	SW6	5.005	SW7	180.8	1.455	1.132	5.8552	
15 minute summer	SW7	5.006	SW8	338.5	3.459	0.467	0.4586	
240 minute summer	SW8	1.008	SW13	100.0	0.559	0.066	26.2628	
15 minute summer	SW9	6.000	SW10	43.2	2.439	0.190	0.5022	
60 minute summer	SW10	6.001	SW11	92.1	0.750	0.382	10.7692	
60 minute summer	SW11	6.002	SW12	142.5	1.147	0.591	11.8682	
60 minute summer	SW12	6.003	SW13	69.2	0.698	0.287	3.6909	
60 minute summer	SW13	1.009	25	145.0	1.142	0.184	1.6082	
120 minute summer	25	1.010	26	248.2	0.766	0.022	0.8685	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	26	27	33.259	2.839	257.6	5.0172	0.0000	SURCHARGED
180 minute summer	26_OUT	112	32.539	0.279	146.0	0.0000	0.0000	OK
15 minute summer	SW15	11	38.157	0.270	50.4	0.8074	0.0000	SURCHARGED
15 minute summer	SW16	11	37.801	0.151	48.6	1.5560	0.0000	OK
15 minute summer	28_OUT	11	37.465	0.138	47.6	0.0000	0.0000	OK
30 minute summer	EXS3	22	36.738	0.708	506.9	160.4462	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	26	1.011	26_OUT	145.7	2.070	1.313	2.3021	1247.9
15 minute summer	SW15	7.000	SW16	48.6	1.241	1.151	1.0491	
15 minute summer	SW16	7.001	28_OUT	47.6	1.773	0.700	0.5105	21.8
30 minute summer	EXS3	2.000_1	7	225.0	1.473	2.615	11.6837	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	1	36.140	0.000	0.0	0.0000	0.0000	OK
120 minute summer	2	106	36.089	0.289	4.3	0.5100	0.0000	OK
120 minute summer	3	106	36.089	0.299	7.6	0.5277	0.0000	OK
120 minute summer	4	106	36.089	0.379	12.5	0.6690	0.0000	OK
120 minute summer	5	106	36.088	0.418	17.8	0.7394	0.0000	OK
15 minute summer	6	10	36.540	0.200	97.3	0.7178	0.0000	OK
120 minute summer	7	106	36.088	0.668	249.0	2.1456	0.0000	SURCHARGED
120 minute summer	8	106	36.086	0.766	344.7	3.8804	0.0000	SURCHARGED
120 minute summer	9	106	36.085	0.485	163.2	4.2673	0.0000	OK
120 minute summer	SW14	106	36.085	1.087	557.9	746.0036	0.0000	SURCHARGED
120 minute summer	11	106	36.085	1.275	369.5	2.2521	0.0000	SURCHARGED
15 minute summer	SW1	11	37.092	0.497	40.4	0.8032	0.0000	SURCHARGED
15 minute summer	SW2	11	37.090	0.507	174.2	2.2023	0.0000	SURCHARGED
15 minute summer	SW3	11	37.028	0.476	168.6	0.3026	0.0000	SURCHARGED
15 minute summer	SW4	11	36.923	0.444	168.3	0.2827	0.0000	OK
15 minute summer	SW5	11	36.858	0.415	168.0	0.2642	0.0000	OK
15 minute summer	SW6	11	36.760	0.381	167.0	0.2422	0.0000	OK
15 minute summer	SW7	11	36.575	0.302	312.5	1.1747	0.0000	OK
120 minute summer	SW8	106	36.081	1.737	141.8	6.0183	0.0000	SURCHARGED
15 minute summer	SW9	10	36.153	0.088	40.4	0.1692	0.0000	OK
60 minute summer	SW10	46	34.772	0.508	97.0	1.4501	0.0000	OK
60 minute summer	SW11	45	34.772	0.633	156.2	1.9067	0.0000	SURCHARGED
60 minute summer	SW12	46	34.771	0.769	207.3	141.2643	0.0000	SURCHARGED
60 minute summer	SW13	45	34.768	1.109	163.6	3.3918	0.0000	SURCHARGED
60 minute summer	25	35	33.240	0.264	145.0	0.4669	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	0.0	0.000	0.000	1.0234	
120 minute summer	2	1.001	3	-4.3	-0.280	-0.040	2.3770	
120 minute summer	3	1.003	4	-7.6	-0.167	-0.018	1.5770	
120 minute summer	4	1.004	5	-12.5	-0.173	-0.079	6.3845	
120 minute summer	5	1.005	7	-17.8	-0.111	-0.040	5.8334	
15 minute summer	6	2.000	7	95.7	1.455	0.797	4.7316	
120 minute summer	7	2.001	8	238.3	1.525	0.645	9.6984	
120 minute summer	8	1.006	11	336.2	1.323	0.335	33.9100	
120 minute summer	9	4.000	SW14	163.2	1.712	0.243	16.5793	
120 minute summer	SW14	4.001	11	-373.8	-1.377	-1.102	4.3592	
120 minute summer	11	1.007	SW8	99.0	0.654	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	38.5	0.243	0.240	0.7819	
15 minute summer	SW2	5.001	SW3	168.6	1.068	1.049	1.9847	
15 minute summer	SW3	5.002	SW4	168.3	1.062	1.047	4.5974	
15 minute summer	SW4	5.003	SW5	168.0	1.077	1.046	2.2417	
15 minute summer	SW5	5.004	SW6	167.0	1.126	1.045	3.8262	
15 minute summer	SW6	5.005	SW7	166.9	1.431	1.045	5.4953	
15 minute summer	SW7	5.006	SW8	311.8	3.407	0.430	0.4299	
120 minute summer	SW8	1.008	SW13	100.0	0.564	0.066	28.2634	
15 minute summer	SW9	6.000	SW10	40.0	2.390	0.176	0.4750	
60 minute summer	SW10	6.001	SW11	88.3	0.752	0.366	10.7184	
60 minute summer	SW11	6.002	SW12	137.1	1.127	0.569	11.8682	
60 minute summer	SW12	6.003	SW13	67.1	0.695	0.278	3.6909	
60 minute summer	SW13	1.009	25	145.0	1.142	0.184	1.6082	
60 minute summer	25	1.010	26	235.5	0.919	0.021	0.8658	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	26	43	33.258	2.838	235.5	5.0147	0.0000	SURCHARGED
60 minute winter	26_OUT	57	32.539	0.279	145.9	0.0000	0.0000	OK
15 minute summer	SW15	11	38.116	0.229	46.7	0.6856	0.0000	SURCHARGED
15 minute summer	SW16	11	37.793	0.143	44.6	1.4370	0.0000	OK
15 minute summer	28_OUT	11	37.458	0.131	44.1	0.0000	0.0000	OK
30 minute summer	EXS3	22	36.691	0.661	473.9	149.7760	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	26	1.011	26_OUT	145.8	2.071	1.314	2.3022	1467.0
15 minute summer	SW15	7.000	SW16	44.6	1.217	1.055	1.0312	
15 minute summer	SW16	7.001	28_OUT	44.1	1.747	0.649	0.4798	20.2
30 minute summer	EXS3	2.000_1	7	213.0	1.405	2.475	11.5329	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	116	36.745	0.605	11.9	1.0695	0.0000	SURCHARGED
15 minute summer	2	12	36.765	0.965	77.6	1.7054	0.0000	SURCHARGED
15 minute summer	3	12	36.778	0.988	123.0	1.7457	0.0000	SURCHARGED
15 minute summer	4	12	36.747	1.037	227.7	1.8331	0.0000	SURCHARGED
120 minute winter	5	116	36.745	1.075	58.6	1.9001	0.0000	SURCHARGED
15 minute summer	6	12	37.593	1.253	141.1	4.5085	0.0000	SURCHARGED
120 minute winter	7	116	36.745	1.325	275.4	4.2545	0.0000	SURCHARGED
120 minute winter	8	116	36.743	1.423	348.7	7.2077	0.0000	SURCHARGED
120 minute winter	9	116	36.742	1.142	163.0	10.0464	0.0000	SURCHARGED
120 minute winter	SW14	118	36.743	1.745	526.0	1197.4150	0.0000	SURCHARGED
120 minute winter	11	118	36.742	1.932	374.4	3.4133	0.0000	SURCHARGED
15 minute summer	SW1	11	37.696	1.101	58.6	1.7779	0.0000	SURCHARGED
15 minute summer	SW2	11	37.691	1.108	250.0	4.8119	0.0000	FLOOD RISK
15 minute summer	SW3	11	37.559	1.007	242.8	0.6408	0.0000	FLOOD RISK
15 minute summer	SW4	11	37.333	0.854	242.5	0.5430	0.0000	SURCHARGED
15 minute summer	SW5	11	37.190	0.747	242.3	0.4752	0.0000	SURCHARGED
15 minute summer	SW6	11	36.982	0.603	242.1	0.3833	0.0000	SURCHARGED
120 minute winter	SW7	116	36.739	0.466	142.2	1.8093	0.0000	SURCHARGED
120 minute winter	SW8	116	36.738	2.394	142.2	8.2934	0.0000	SURCHARGED
120 minute winter	SW9	88	36.310	0.245	17.4	0.4695	0.0000	OK
120 minute winter	SW10	88	36.308	2.044	62.3	5.8306	0.0000	FLOOD RISK
120 minute winter	SW11	86	36.310	2.171	103.7	6.5405	0.0000	FLOOD RISK
120 minute winter	SW12	86	36.308	2.306	147.1	206.2205	0.0000	FLOOD RISK
120 minute winter	SW13	84	36.308	2.649	180.3	8.1020	0.0000	FLOOD RISK
60 minute summer	25	34	33.240	0.264	145.0	0.4672	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)
120 minute winter	1	1.000	2	-11.9	-0.231	-0.113	2.6628	
15 minute summer	2	1.001	3	-77.6	-0.359	-0.713	4.1353	
15 minute summer	3	1.003	4	-123.0	-0.996	-0.294	2.3215	
15 minute summer	4	1.004	5	-227.7	-1.102	-1.432	7.8528	
120 minute winter	5	1.005	7	-58.6	-0.276	-0.131	6.2917	
15 minute summer	6	2.000	7	124.6	1.769	1.037	5.5454	
120 minute winter	7	2.001	8	252.5	1.490	0.684	9.6984	
120 minute winter	8	1.006	11	344.7	1.318	0.343	33.9100	
120 minute winter	9	4.000	SW14	162.5	1.944	0.242	17.7617	
120 minute winter	SW14	4.001	11	-372.8	-1.324	-1.099	4.3592	
120 minute winter	11	1.007	SW8	99.0	0.626	0.098	25.8320	
15 minute summer	SW1	5.000	SW2	55.5	0.350	0.346	0.7819	
15 minute summer	SW2	5.001	SW3	242.8	1.533	1.511	1.9847	
15 minute summer	SW3	5.002	SW4	242.5	1.531	1.510	4.6025	
15 minute summer	SW4	5.003	SW5	242.3	1.529	1.509	2.2840	
15 minute summer	SW5	5.004	SW6	242.1	1.528	1.515	4.0966	
15 minute summer	SW6	5.005	SW7	242.0	1.528	1.515	6.6577	
120 minute winter	SW7	5.006	SW8	142.2	2.924	0.196	0.7467	
120 minute winter	SW8	1.008	SW13	117.7	0.597	0.077	38.1110	
120 minute winter	SW9	6.000	SW10	17.4	1.897	0.077	1.8693	
120 minute winter	SW10	6.001	SW11	60.0	0.600	0.249	10.7692	
120 minute winter	SW11	6.002	SW12	101.9	1.057	0.423	11.8682	
120 minute winter	SW12	6.003	SW13	80.8	0.441	0.335	3.6909	
120 minute winter	SW13	1.009	25	145.0	1.142	0.184	1.6082	
60 minute summer	25	1.010	26	258.9	0.785	0.023	0.8657	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	26	144	33.298	2.878	241.5	5.0855	0.0000	SURCHARGED
240 minute summer	26_OUT	192	32.539	0.279	146.0	0.0000	0.0000	OK
15 minute summer	SW15	11	38.400	0.513	67.7	1.5322	0.0000	FLOOD RISK
15 minute summer	SW16	12	37.842	0.192	64.8	2.2051	0.0000	OK
15 minute summer	28_OUT	12	37.496	0.169	62.8	0.0000	0.0000	OK
30 minute summer	EXS3	22	37.510	1.480	687.2	233.0456	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	26	1.011	26_OUT	145.9	2.072	1.315	2.3022	2638.8
15 minute summer	SW15	7.000	SW16	64.8	1.630	1.534	1.0950	
15 minute summer	SW16	7.001	28_OUT	62.8	1.841	0.925	0.6462	29.2
30 minute summer	EXS3	2.000_1	7	308.4	1.947	3.584	12.9943	

LFC Academy

Drainage Maintenance Report

Curtins Ref: 088269-CUR-XX-XX-T-C-00004

Revision: P01

Issue Date: 5-Dec-25

Client Name: Liverpool Football Club

Client Address: Anfield, Anfield Road, Liverpool, L4 0TH

Site Address: The Liverpool Way, Liverpool L33 7ED

Rev	Description	Issued by	Checked	Date
P01	Issued for Stage 3	MB	MB	05/12/2025

This specification has been prepared for the sole benefit, use, and information for the client. The liability of Curtins Consulting Limited with respect to the information contained in the specification will not extend to any third party.

Author	Signature	Date
Marc Barlow Senior Engineer		05/12/2025

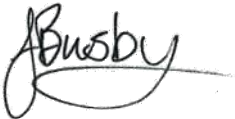
Reviewed	Signature	Date
Jake Busby Principal Engineer		05/12/2025

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1.0 Maintenance Requirements

This report is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

A management and maintenance plan for the lifetime of the development shall include the arrangements for a maintenance/management contract where required to secure the operation of the sustainable urban drainage scheme throughout its lifetime.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

The following items are proposed for the drainage scheme:

- Pipes;
- Manholes;
- Linear Drains;
- Bio retention areas / filter drains;
- Permeable Paving;
- Detention Basin;
- Flow Controls.

It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event. During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

1.1.1 Pipes

Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.

Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

Access for maintenance is provided through access chambers and manholes.

Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.

Maintenance Schedule	Required Action	Frequency
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

1.1.2 Manholes

Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

1.1.3 Linear Drainage

Channels should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned using a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be always kept clear to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including channel outlet boxes.	Half yearly and after large storms.
	Litter and debris removal	Monthly or as required.

Maintenance Schedule	Required Action	Frequency
Regular maintenance\ inspection	Check and remove large vegetation growth near channel runs.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Remedial Action	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.

1.1.4 Bioretention Areas

Bioretention Areas will require regular maintenance to ensure continuing operation to design performance standards. Adequate access should be provided for all bioretention areas for inspection and maintenance including for the appropriate equipment and vehicles.

Sediments excavated from pre-treatment devices that received runoff from residential or standard road and roof areas are generally not toxic or hazardous materials and can therefore be safely disposed of either by land application or landfilling. However, consultation should take place with the environmental regulator to confirm appropriate protocols.

Maintenance Schedule	Required Action	Frequency
Regular inspection	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary.	Quarterly
	Check operation of underdrains by inspection of flows after rain.	Annually
	Assess plants for disease infection, poor growth, invasive species etc. and replace as necessary.	Quarterly
	Inspect inlets and outlets for blockage.	Quarterly
Regular Maintenance	Remove litter and surface debris and weeds.	Quarterly
	Replace any plants to maintain planting density.	As required
	Remove sediment, litter and debris build up from around inlets or from forebays.	Quarterly or biannually
Occasional Maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required.	As required

Maintenance Schedule	Required Action	Frequency
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch.	As required
Remedial Action	Remove and replace filter medium and vegetation above.	As required but likely to be >20 years.

1.1.5 Permeable Paving

The permeable pavements have been designed in accordance with CIRIA C697 and BS7533-13.

The permeable pavements are intended to be water quality features. These features are intended to be dry except during rainfall events.

The surface has been designed to be porous or to contain gaps where rain can flow through the upper construction layers into the voided stone which makes up the subbase.

Access for maintenance is provided as this is a surface feature only.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect feature surface to identify evidence of erosion, compaction, ponding, and contamination. Record areas where water is ponding for >48 hours.	Every three months and after large storms.

Maintenance Schedule	Required Action	Frequency
	Check features surface for even gradients	Half yearly.
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly.
	Inspect silt accumulation rates and establish appropriate removal frequencies.	Half yearly.
Regular Maintenance\ inspection	Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	Annually.
	Litter ad debris removal	Monthly or as required
	Removal of weed	Monthly (at start, then as required).
	Brushing and vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging.

Maintenance Schedule	Required Action	Frequency
Remedial Actions	Re-level uneven surfaces and reinstate design levels. This may be required as part of sediment removal.	As required.

1.1.6 Detention Basin

Detention basins are designed to provide temporary storage for surface water runoff, allowing for controlled discharge and sediment settlement. Proper maintenance ensures long-term hydraulic performance, structural integrity, and water quality benefits.

Vegetation (if present) plays a key role in pollutant removal and should be maintained for optimal function. Inlets, outlets, and overflow structures should be routinely inspected to prevent blockages and erosion.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial inspection of inlets, outlets, and basin area. Check for signs of erosion, sedimentation, or poor drainage.	Half-yearly and after major storm events
Regular maintenance\ inspection	Litter and debris removal (especially at inlets, outlets, and overflow structures).	Monthly or as required
	Grass cutting (during growing season) to maintain design levels and prevent weed growth.	Monthly during growing season
	Inspection of vegetated areas for health and signs of invasive species.	Quarterly
	Check for standing water or evidence of blockages.	Monthly or after heavy rainfall

Maintenance Schedule	Required Action	Frequency
	Visual check for erosion at inlet/outlet locations and general basin condition.	Quarterly
Occasional maintenance	Remove sediment build-up from forebay or low points.	Annually or as required
	Weed control and removal of unwanted vegetation.	Bi-annually or as required
	Replanting or restoration of vegetated areas, if necessary	Annually or as required
	Structural inspection of inlets, outlets, and overflow structures	Annually
Remedial Actions	Repair erosion or scouring at inlets, outlets, or embankments.	As required
	Remove and dispose of excessive sediment if affecting storage capacity	As required
	Reinstate or improve vegetation in bare or eroded areas.	As required

1.1.1 Flow Control Units

The flow control units are intended for flood control and flow restriction.

The flow controls are specified as Hydro-brake or similar approved and are proprietary products; therefore, manufacturer's recommendations should also be taken in to consideration.

Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

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