30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	20.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	30 Summer	30	+0%	30/15 Summer			
S1.001	STANK 1 US	30 Summer	30	+0%				
S1.002	STANK 1 DS	30 Summer	30	+0%	30/15 Summer			
S1.003	S2	30 Summer	30	+0%	30/15 Summer			
S1.004	S3	30 Summer	30	+0%	30/15 Summer			
S1.005	S4	60 Summer	30	+0%	30/15 Summer			
S1.006	STANK 2 US	720 Winter	30	+0%				
S1.007	STANK 2 DS	720 Winter	30	+0%	30/15 Summer			
S1.008	S5	720 Winter	30	+0%	30/15 Summer			
S2.000	S6	720 Winter	30	+0%	30/15 Summer			
S2.001	STANK 3 US	720 Winter	30	+0%				
S2.002	STANK 3 DS	720 Winter	30	+0%	30/120 Summer			
S2.003	S7	720 Winter	30	+0%	30/120 Summer			
S2.004	STANK 4 US	720 Winter	30	+0%				
S2.005	STANK 4 ND	720 Winter	30	+0%				
S2.006	STANK 4 DS	720 Winter	30	+0%	30/120 Summer			
S2.007	S8	720 Winter	30	+0%	30/120 Summer			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	28.015	0.177	0.000	1.28			32.4	SURCHARGED
S1.001	STANK 1 US	27.996	-0.437	0.000	0.01			56.8	OK*
S1.002	STANK 1 DS	27.993	0.175	0.000	0.60			18.0	SURCHARGED*
S1.003	S2	27.991	0.181	0.000	0.60			18.4	SURCHARGED
S1.004	S3	27.980	0.217	0.000	0.92			28.4	SURCHARGED
S1.005	S4	27.938	0.153	0.000	0.98			50.0	SURCHARGED
S1.006	STANK 2 US	27.907	-0.604	0.000	0.00			10.0	OK*
S1.007	STANK 2 DS	27.907	0.147	0.000	0.14			8.7	SURCHARGED*
S1.008	S5	27.906	0.173	0.000	0.19			11.8	SURCHARGED
S2.000	S6	27.906	0.094	0.000	0.08			2.6	SURCHARGED
S2.001	STANK 3 US	27.906	-0.032	0.000	0.00			2.5	OK*
S2.002	STANK 3 DS	27.906	0.089	0.000	0.03			1.9	SURCHARGED*
S2.003	S7	27.906	0.098	0.000	0.03			1.9	SURCHARGED
S2.004	STANK 4 US	27.906	-0.013	0.000	0.00			1.9	OK*
S2.005	STANK 4 ND	27.906	-0.012	0.000	0.00			1.5	OK*
S2.006	STANK 4 DS	27.906	0.108	0.000	0.02			1.3	SURCHARGED*
S2.007	S8	27.906	0.118	0.000	0.03			2.4	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	S1	
S1.001	STANK 1 US	
S1.002	STANK 1 DS	
S1.003	S2	
S1.004	S3	
S1.005	S4	
S1.006	STANK 2 US	
S1.007	STANK 2 DS	
S1.008	S5	
S2.000	S6	
S2.001	STANK 3 US	
S2.002	STANK 3 DS	
S2.003	S7	
S2.004	STANK 4 US	
S2.005	STANK 4 ND	
S2.006	STANK 4 DS	
S2.007	S8	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.009	S10	720 Winter	30	+0%	30/30 Summer		
S1.010	STANk 5 US	720 Winter	30	+0%			
S1.011	STANk 5 DS	720 Winter	30	+0%	30/30 Summer		
S1.012	S11	720 Winter	30	+0%	30/30 Summer		
S1.013	STANK 6 US	720 Winter	30	+0%			
S1.014	STANK 6 DS	720 Winter	30	+0%	30/30 Summer		
S1.015	S12	720 Winter	30	+0%	30/30 Summer		
S1.016	STANK 7 US	720 Winter	30	+0%			
S1.017	STANK 7 DS	720 Winter	30	+0%	30/30 Summer		
S3.000	S13	15 Summer	30	+0%	100/15 Summer		
S3.001	S14	15 Summer	30	+0%	30/15 Summer		
S3.002	STANK 8 US	720 Winter	30	+0%			
S3.003	STANK 8 ND1	720 Winter	30	+0%			
S3.004	STANK 8 DS	720 Winter	30	+0%	30/15 Summer		
S3.005	S14A	720 Winter	30	+0%	30/15 Summer		
S3.006	S15	720 Winter	30	+0%	30/15 Summer		
S3.007	S16	720 Winter	30	+0%	30/30 Summer		
S3.008	STANK 9 US	720 Winter	30	+0%			
S3.009	STANK 9 DS	720 Winter	30	+0%	30/30 Summer		
S3.010	S17	720 Winter	30	+0%	30/30 Summer		
S3.011	STANK 11 US	720 Winter	30	+0%			
S3.012	STANK 11 DS	720 Winter	30	+0%	30/30 Summer		
S3.013	S18	720 Winter	30	+0%	30/30 Summer		
S1.018	S19	720 Winter	30	+0%	30/60 Summer		
S1.019	S20	720 Winter	30	+0%	30/60 Summer		
S1.020	STANK 12 US	720 Winter	30	+0%			
S1.021	STANK 12 ND 1	720 Winter	30	+0%			
S1.022	STANK 12 DS	720 Winter	30	+0%	30/30 Summer		
S1.023	S21	720 Winter	30	+0%	30/30 Summer		
S4.000	SPPCP01	15 Summer	30	+0%	1/15 Summer	100/15 Summer	
S4.001	S22	15 Summer	30	+0%	1/15 Summer		
S1.024	S23	720 Winter	30	+0%	30/15 Summer		
S1.025	S24	720 Winter	30	+0%	1/15 Summer		
S1.026	SInt	2880 Summer	30	+0%			
S1.027	S25	1440 Winter	30	+0%			

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.009	S10		27.906	0.158	0.000	0.15			14.0
S1.010	STANk 5 US		27.905	-0.265	0.000	0.00			13.8
S1.011	STANk 5 DS		27.905	0.200	0.000	0.07			8.0
S1.012	S11		27.904	0.209	0.000	0.17			14.5
S1.013	STANK 6 US		27.904	-0.240	0.000	0.00			14.4
S1.014	STANK 6 DS		27.904	0.226	0.000	0.09			9.7
S1.015	S12		27.903	0.270	0.000	0.17			14.6

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.016	STANK 7 US		27.902	-0.391	0.000	0.00			14.6
S1.017	STANK 7 DS		27.902	0.285	0.000	0.10			10.2
S3.000	S13		28.363	-0.098	0.000	0.25			6.9
S3.001	S14		27.931	0.202	0.000	2.44			65.5
S3.002	STANK 8 US		27.905	-0.624	0.000	0.00			4.4
S3.003	STANK 8 ND1		27.905	-0.624	0.000	0.00			3.8
S3.004	STANK 8 DS		27.905	0.201	0.000	0.12			3.5
S3.005	S14A		27.905	0.215	0.000	0.11			3.5
S3.006	S15		27.904	0.291	0.000	0.15			5.0
S3.007	S16		27.903	0.288	0.000	0.04			2.5
S3.008	STANK 9 US		27.903	-0.665	0.000	0.00			2.4
S3.009	STANK 9 DS		27.903	0.296	0.000	0.04			2.2
S3.010	S17		27.903	0.303	0.000	0.05			2.6
S3.011	STANK 11 US		27.902	-0.651	0.000	0.00			2.9
S3.012	STANK 11 DS		27.902	0.310	0.000	0.04			2.5
S3.013	S18		27.902	0.264	0.000	0.02			2.5
S1.018	S19		27.902	0.200	0.000	0.05			10.6
S1.019	S20		27.901	0.231	0.000	0.05			11.1
S1.020	STANK 12 US		27.900	-0.045	0.000	0.00			11.0
S1.021	STANK 12 ND 1		27.896	-0.048	0.000	0.00			8.5
S1.022	STANK 12 DS		27.894	0.265	0.000	0.04			9.2
S1.023	S21		27.900	0.281	0.000	0.04			8.8
S4.000	SPPCP01		28.145	0.770	0.000	1.27			21.5
S4.001	S22		28.039	0.744	0.000	1.85			32.7
S1.024	S23		27.908	0.343	0.000	0.05			10.0
S1.025	S24		27.908	0.598	0.000	0.14			7.5
S1.026	SInt		27.012	-0.231	0.000	0.12			7.5
S1.027	S25		26.959	-0.224	0.000	0.15			7.5

PN	US/MH Name	Status	Level Exceeded
S1.009	S10	SURCHARGED	
S1.010	STANk 5 US	OK*	
S1.011	STANk 5 DS	SURCHARGED*	
S1.012	S11	SURCHARGED	
S1.013	STANK 6 US	OK*	
S1.014	STANK 6 DS	SURCHARGED*	
S1.015	S12	SURCHARGED	
S1.016	STANK 7 US	OK*	
S1.017	STANK 7 DS	SURCHARGED*	
S3.000	S13	OK	
S3.001	S14	SURCHARGED	
S3.002	STANK 8 US	OK*	
S3.003	STANK 8 ND1	OK*	
S3.004	STANK 8 DS	SURCHARGED*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Status	Level Exceeded
S3.005	S14A	SURCHARGED	
S3.006	S15	SURCHARGED	
S3.007	S16	SURCHARGED	
S3.008	STANK 9 US	OK*	
S3.009	STANK 9 DS	SURCHARGED*	
S3.010	S17	SURCHARGED	
S3.011	STANK 11 US	OK*	
S3.012	STANK 11 DS	SURCHARGED*	
S3.013	S18	SURCHARGED	
S1.018	S19	SURCHARGED	
S1.019	S20	SURCHARGED	
S1.020	STANK 12 US	OK*	
S1.021	STANK 12 ND 1	OK*	
S1.022	STANK 12 DS	SURCHARGED*	
S1.023	S21	SURCHARGED	
S4.000	SPPCP01	SURCHARGED	3
S4.001	S22	SURCHARGED	
S1.024	S23	SURCHARGED	
S1.025	S24	SURCHARGED	
S1.026	SInt	OK*	
S1.027	S25	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 1
Number of Online Controls 1 Number of Time/Area Diagrams 0
Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
Region England and Wales Cv (Summer) 1.000
M5-60 (mm) 20.000 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	600 Winter	100	+40%	30/15 Summer			
S1.001	STANK 1 US	1440 Winter	100	+40%				
S1.002	STANK 1 DS	1440 Winter	100	+40%	30/15 Summer			
S1.003	S2	600 Winter	100	+40%	30/15 Summer			
S1.004	S3	600 Winter	100	+40%	30/15 Summer			
S1.005	S4	600 Winter	100	+40%	30/15 Summer			
S1.006	STANK 2 US	600 Winter	100	+40%				
S1.007	STANK 2 DS	600 Winter	100	+40%	30/15 Summer			
S1.008	S5	600 Winter	100	+40%	30/15 Summer			
S2.000	S6	600 Winter	100	+40%	30/15 Summer			
S2.001	STANK 3 US	10080 Summer	100	+40%				
S2.002	STANK 3 DS	10080 Summer	100	+40%	30/120 Summer			
S2.003	S7	600 Winter	100	+40%	30/120 Summer			
S2.004	STANK 4 US	10080 Summer	100	+40%				
S2.005	STANK 4 ND	10080 Summer	100	+40%				
S2.006	STANK 4 DS	10080 Summer	100	+40%	30/120 Summer			
S2.007	S8	600 Winter	100	+40%	30/120 Summer			

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	28.527	0.689	0.000	0.23			5.7	SURCHARGED
S1.001	STANK 1 US	28.433	0.000	0.000	0.00			5.0	SURCHARGED*
S1.002	STANK 1 DS	28.433	0.615	0.000	0.10			3.0	SURCHARGED*
S1.003	S2	28.527	0.717	0.000	0.25			7.6	SURCHARGED
S1.004	S3	28.526	0.763	0.000	0.39			12.0	SURCHARGED
S1.005	S4	28.525	0.740	0.000	0.31			15.8	SURCHARGED
S1.006	STANK 2 US	28.511	0.000	0.000	0.00			15.7	SURCHARGED*
S1.007	STANK 2 DS	28.510	0.750	0.000	0.22			13.7	SURCHARGED*
S1.008	S5	28.524	0.791	0.000	0.32			19.5	SURCHARGED
S2.000	S6	28.528	0.716	0.000	0.17			5.6	SURCHARGED
S2.001	STANK 3 US	27.938	0.000	0.000	0.00			0.9	SURCHARGED*
S2.002	STANK 3 DS	27.938	0.121	0.000	0.01			0.8	SURCHARGED*
S2.003	S7	28.526	0.718	0.000	0.08			4.6	SURCHARGED
S2.004	STANK 4 US	27.919	0.000	0.000	0.00			0.7	SURCHARGED*
S2.005	STANK 4 ND	27.918	0.000	0.000	0.00			0.9	SURCHARGED*
S2.006	STANK 4 DS	27.918	0.120	0.000	0.02			1.0	SURCHARGED*
S2.007	S8	28.526	0.738	0.000	0.10			7.4	SURCHARGED

PN	US/MH Name	Level Exceeded
S1.000	S1	
S1.001	STANK 1 US	
S1.002	STANK 1 DS	
S1.003	S2	
S1.004	S3	
S1.005	S4	
S1.006	STANK 2 US	
S1.007	STANK 2 DS	
S1.008	S5	
S2.000	S6	
S2.001	STANK 3 US	
S2.002	STANK 3 DS	
S2.003	S7	
S2.004	STANK 4 US	
S2.005	STANK 4 ND	
S2.006	STANK 4 DS	
S2.007	S8	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S1.009	S10	600 Winter	100	+40%	30/30 Summer		
S1.010	STANK 5 US	4320 Summer	100	+40%			
S1.011	STANK 5 DS	4320 Summer	100	+40%	30/30 Summer		
S1.012	S11	600 Winter	100	+40%	30/30 Summer		
S1.013	STANK 6 US	4320 Summer	100	+40%			
S1.014	STANK 6 DS	4320 Summer	100	+40%	30/30 Summer		
S1.015	S12	600 Winter	100	+40%	30/30 Summer		
S1.016	STANK 7 US	720 Winter	100	+40%			
S1.017	STANK 7 DS	720 Winter	100	+40%	30/30 Summer		
S3.000	S13	15 Summer	100	+40%	100/15 Summer		
S3.001	S14	15 Summer	100	+40%	30/15 Summer		
S3.002	STANK 8 US	600 Winter	100	+40%			
S3.003	STANK 8 ND1	600 Winter	100	+40%			
S3.004	STANK 8 DS	600 Winter	100	+40%	30/15 Summer		
S3.005	S14A	600 Winter	100	+40%	30/15 Summer		
S3.006	S15	600 Winter	100	+40%	30/15 Summer		
S3.007	S16	600 Winter	100	+40%	30/30 Summer		
S3.008	STANK 9 US	600 Winter	100	+40%			
S3.009	STANK 9 DS	600 Winter	100	+40%	30/30 Summer		
S3.010	S17	600 Winter	100	+40%	30/30 Summer		
S3.011	STANK 11 US	600 Winter	100	+40%			
S3.012	STANK 11 DS	600 Winter	100	+40%	30/30 Summer		
S3.013	S18	600 Winter	100	+40%	30/30 Summer		
S1.018	S19	600 Winter	100	+40%	30/60 Summer		
S1.019	S20	600 Winter	100	+40%	30/60 Summer		
S1.020	STANK 12 US	10080 Summer	100	+40%			
S1.021	STANK 12 ND 1	10080 Summer	100	+40%			
S1.022	STANK 12 DS	10080 Summer	100	+40%	30/30 Summer		
S1.023	S21	600 Winter	100	+40%	30/30 Summer		
S4.000	SPPCP01	15 Summer	100	+40%	1/15 Summer	100/15 Summer	
S4.001	S22	15 Summer	100	+40%	1/15 Summer		
S1.024	S23	600 Winter	100	+40%	30/15 Summer		
S1.025	S24	600 Winter	100	+40%	1/15 Summer		
S1.026	SInt	600 Winter	100	+40%			
S1.027	S25	600 Winter	100	+40%			

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.009	S10		28.526	0.778	0.000	0.27			25.6
S1.010	STANk 5 US		28.170	0.000	0.000	0.00			6.8
S1.011	STANk 5 DS		28.169	0.464	0.000	0.11			12.2
S1.012	S11		28.529	0.834	0.000	0.43			35.7
S1.013	STANK 6 US		28.144	0.000	0.000	0.00			14.1
S1.014	STANK 6 DS		28.143	0.465	0.000	0.13			14.3
S1.015	S12		28.528	0.895	0.000	0.34			28.5

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.016	STANK 7 US		28.293	0.000	0.000	0.00			26.1
S1.017	STANK 7 DS		28.292	0.675	0.000	0.22			23.4
S3.000	S13		28.613	0.152	0.000	0.54			14.7
S3.001	S14		28.517	0.788	0.000	4.17			112.0
S3.002	STANK 8 US		28.509	-0.020	0.000	0.00			9.1
S3.003	STANK 8 ND1		28.509	-0.020	0.000	0.00			6.2
S3.004	STANK 8 DS		28.509	0.805	0.000	0.15			4.5
S3.005	S14A		28.508	0.818	0.000	0.14			4.4
S3.006	S15		28.507	0.894	0.000	0.23			7.5
S3.007	S16		28.504	0.889	0.000	0.14			7.7
S3.008	STANK 9 US		28.504	-0.064	0.000	0.00			7.6
S3.009	STANK 9 DS		28.504	0.897	0.000	0.17			10.4
S3.010	S17		28.504	0.904	0.000	0.19			10.5
S3.011	STANK 11 US		28.505	-0.048	0.000	0.00			10.4
S3.012	STANK 11 DS		28.505	0.913	0.000	0.32			19.4
S3.013	S18		28.512	0.874	0.000	0.18			19.3
S1.018	S19		28.526	0.824	0.000	0.14			29.0
S1.019	S20		28.529	0.859	0.000	0.14			28.7
S1.020	STANK 12 US		27.945	0.000	0.000	0.00			8.0
S1.021	STANK 12 ND 1		27.944	0.000	0.000	0.00			8.0
S1.022	STANK 12 DS		27.944	0.315	0.000	0.05			12.1
S1.023	S21		28.531	0.912	0.000	0.11			24.7
S4.000	SPPCP01		28.648	1.273	3.163	1.98			33.5
S4.001	S22		28.620	1.325	0.000	2.45			43.3
S1.024	S23		28.529	0.964	0.000	0.10			20.4
S1.025	S24		28.528	1.218	0.000	0.36			19.5
S1.026	SInt		27.059	-0.184	0.000	0.32			19.5
S1.027	S25		27.011	-0.172	0.000	0.38			19.5

PN	US/MH Name	Status	Level Exceeded
S1.009	S10	SURCHARGED	
S1.010	STANk 5 US	SURCHARGED*	
S1.011	STANk 5 DS	SURCHARGED*	
S1.012	S11	SURCHARGED	
S1.013	STANK 6 US	SURCHARGED*	
S1.014	STANK 6 DS	SURCHARGED*	
S1.015	S12	SURCHARGED	
S1.016	STANK 7 US	SURCHARGED*	
S1.017	STANK 7 DS	SURCHARGED*	
S3.000	S13	SURCHARGED	
S3.001	S14	SURCHARGED	
S3.002	STANK 8 US	OK*	
S3.003	STANK 8 ND1	OK*	
S3.004	STANK 8 DS	SURCHARGED*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm 26-05-22 Planning

PN	US/MH Name	Status	Level Exceeded
S3.005	S14A	SURCHARGED	
S3.006	S15	SURCHARGED	
S3.007	S16	SURCHARGED	
S3.008	STANK 9 US	OK*	
S3.009	STANK 9 DS	SURCHARGED*	
S3.010	S17	SURCHARGED	
S3.011	STANK 11 US	OK*	
S3.012	STANK 11 DS	SURCHARGED*	
S3.013	S18	SURCHARGED	
S1.018	S19	SURCHARGED	
S1.019	S20	SURCHARGED	
S1.020	STANK 12 US	SURCHARGED*	
S1.021	STANK 12 ND 1	SURCHARGED*	
S1.022	STANK 12 DS	SURCHARGED*	
S1.023	S21	SURCHARGED	
S4.000	SPPCP01	FLOOD	3
S4.001	S22	FLOOD RISK	
S1.024	S23	SURCHARGED	
S1.025	S24	SURCHARGED	
S1.026	SInt	OK*	
S1.027	S25	OK	

Appendix I

Water Cycle Strategy

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Client	Colt DCS
Project No.	P20114
Date	08/102021
Revision	00
Reference	BW-E-P200114-U-REP-700006-0

London 4, Hayes

Water Cycle Strategy

08/10/2021

REVISIONS

Document prepared by:	
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Document checked by:	
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Signature	SW
Date	08/10/2021

Revision:

Revision No.	**Date**	**Revision Details**	**Approved by**
0	08/10/2021	First Issue	SW

CONTENTS

1.0 INTRODUCTION

This report has been produced to detailed the water reduction strategy at the proposed London 4, Hayes Date Centre development in the London Borough of Hillingdon.

1.1 Site Context

The eastern part of the site is occupied by a Data Centre, a co-location facility operated by Optimum Data Centres. The data centre itself was constructed in the 1980s as a warehouse with an element of office space constructed subsequently, before planning permission was granted in 2001 for the change of use to a data centre. It comprises a two storey traditional steel framed warehouse unit with connected two story brick built office extension to the south and plant equipment located across and adjacent to the two buildings.

To the west of the Data Centre (and forming the central element of the site) are the Tudor Works, a terrace of 16 industrial units with two storey office extensions on both the northern and southern ends. The units are of a steel framed construction with profiled. The units are occupied for a range of storage and manufacturing operations.

To the west of the Tudor Works (and forming the very western part of the site) is the Veetec Motor Group facility which comprises a three storey office building at the front of the site, an open yard used for car storage to its rear, and an industrial unit to the rear. The site is used for the receipt, repair, storage, and maintenance of vehicles.

1.2 Site Description

London 4, Hayes is the redevelopment of the site to deliver data centre campus including: two data centre buildings; associated energy and electricity infrastructure, buildings, and plant; security gatehouse, systems and enclosures; works to the highway, car parking and cycle parking; hard and soft landscaping; as well as associated infrastructure, ancillary office use, and associated external works

1.3 Assessment methodology

As the building will be assessed under BREEAM Data Centres, the BREEAM WAT 01 calculator tool will be used to assess the improvements made from water consumption reduction strategies.

2.0 Strategy

2.1 Domestic Water Consumption

As the data centre is using air cooled chillers rather than evaporative cooling, it will have a low water demand compared to other building types. The water demand will come from the occupants of the building, in particular from the occupants of the office areas.

The development will target all BREEAM Credits under Issue WAT01 Water consumption. To achieve this, sanitary ware will be specified with the following minimum performance values:

Fixture Type	Proposed Performance	BREEAM Baseline
WCs	Dual Flush ≤ 6/4 l/flush	Single Flush 6 l/flush
Showers	≤ 9 l/minute	12 l/minute
Wash-hand basin taps	≤ 4 l/minute	10 l/minute
Kitchen Taps	≤ 6 l/minute	10 l/minute
Urinals	1.5 l/bowl/hour	7.5 l/bowl/hour

As the development is a data centre, it will be assessed under BREEAM Data Centres 2010. However, the performance values listed above would enable achievement of BREEAM excellent under BREEAM New Construction 2018.

2.2 Water Recycling

Rain water harvesting will be incorporated to provide water for flushing of toilets to provide at least 50% of toilet flushing demand. The rainwater will be collected from the roof of building one, to then be stored and used as required. This will also provide a degree of attenuation, reducing the strain on the drainage system.

2.3 Minimisation of water loss

A leak detection system will be installed capable of detecting major leaks on the water supply.

Solenoid valves will be fitted to the cold water supply to each toilet area in the building. The valves will be linked to occupancy sensors to automatically turn off the water supply to the area when there are no occupants present.

2.4 Metering and Monitoring

A meter will be specified on the mains water supply to each building, the water meters will be connected to the BMS system for the monitoring of water consumption.

2.5 Irrigation

While the landscaping strategy is still to be fully developed the development is targeting BREEAM credit – WAT 6 – Irrigation Systems. As a result, the irrigation strategy will incorporate at least one of the following strategies:

- Drip feed subsurface irrigation that incorporates soil moisture sensors. The irrigation control should be zoned to permit variable irrigation to different planting assemblages.
- Reclaimed water from a rainwater or greywater system.
- External landscaping and planting that relies solely on precipitation, during all seasons of the year.
- The only planting specified is restricted to species that thrive in hot and dry conditions.
- Where no dedicated, mains-supplied irrigation systems (including pop-up sprinklers and hoses) are specified, and planting will rely solely on manual watering by building occupier or landlord.

2.6 Calculations

Water consumption has been calculated using the BREEAM New Construction WAT 01 calculator. The results are as follows:

	Proposed Performance (l/person/day)	BREEAM Baseline (l/person/day)	Improvement (%)
Predicted Consumption (excludes fixed uses)	21.61	32.60	33.7%
Water Demand met by Rainwater	13.64	0.00	N/A
Net Water Consumption (excludes fixed uses)	7.97	32.60	75.5%
Net Water Consumption (includes fixed uses)	9.55	34.18	72.1%

Fixed water uses includes water uses not included in sanitaryware- this includes items such as drinking water fountains and cleaning in kitchens. Due to the nature of the building and the cooling strategy employed, this number is predicted to be very low.

Significant reductions in water consumption are expected when compared to the BREEAM baseline. This largely due to the rainwater harvesting. Having a large roof for a catchment area for a relatively low occupancy building means that large proportion of the water demand (63%) can be met by the rainwater.

2.7 Drainage

Full detail of the drainage strategy can be found in the Drainage Strategy report produced by ARUP. The summary, extracted from the Arup report, is shown below:

It is proposed that the London 4 development discharges via one of the sites' existing connections to Thames Water (TW) storm water sewer, which outfalls to the Yeading Brook within the south of the site.

SuDS features have been incorporated into the development where possible. External surfaces will drain by a combination of permeable paving and green roofs. Traditional systems will however be required in some locations due the operational requirements of the site. A full retention class one interceptor is proposed at the downstream extent of the site.

Storm water storage will need to be provided in the form of geocellular tanks which will be distributed around the site to suit utility coordination.

An allowance of 40% increased rainfall intensity has been incorporated into the design to account for potential climate change.

It is proposed that foul water from the site discharges to one of the existing connections to the TW foul water sewer. TW have confirmed that this is acceptable based on their own assessment of potential flows from the site

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