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The Arup Campus Blyth Gate Solihull B90 8AE		
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Area Summary for Storm 26-05-22 Planning

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
3.012	-	-	100	0.000	0.000	0.000
3.013	-	-	100	0.000	0.000	0.000
1.018	Classification	ROAD	100	0.032	0.032	0.032
	Classification	ROAD	100	0.039	0.039	0.072
1.019	Classification	ROAD	100	0.076	0.076	0.076
1.020	-	-	100	0.000	0.000	0.000
1.021	-	-	100	0.000	0.000	0.000
1.022	-	-	100	0.000	0.000	0.000
1.023	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.049	0.049	0.049
4.001	Classification	ROAD	100	0.028	0.028	0.028
1.024	Classification	Roof	100	0.348	0.348	0.348
1.025	-	-	100	0.000	0.000	0.000
1.026	-	-	100	0.000	0.000	0.000
1.027	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				2.051	2.051	2.051

Free Flowing Outfall Details for Storm 26-05-22 Planning

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
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S1.027	S	28.660	26.860	26.860	0	0
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Simulation Criteria for Storm 26-05-22 Planning

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.400		

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<u>Online Controls for Storm 26-05-22 Planning</u> <u>Complex Manhole: S24, DS/PN: S1.025, Volume (m³): 3.6</u> <u>Hydro-Brake® Optimum</u> <table><tr><td>Unit Reference</td><td>MD-SHE-0120-7500-1500-7500</td></tr><tr><td>Design Head (m)</td><td>1.500</td></tr><tr><td>Design Flow (l/s)</td><td>7.5</td></tr><tr><td>Flush-Flo™</td><td>Calculated</td></tr><tr><td>Objective</td><td>Minimise upstream storage</td></tr><tr><td>Application</td><td>Surface</td></tr><tr><td>Sump Available</td><td>Yes</td></tr><tr><td>Diameter (mm)</td><td>120</td></tr><tr><td>Invert Level (m)</td><td>27.010</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td>150</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td>1200</td></tr></table> <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.500</td><td>7.5</td></tr><tr><td>Flush-Flo™</td><td>0.445</td><td>7.5</td></tr><tr><td>Kick-Flo®</td><td>0.926</td><td>6.0</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>6.6</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>4.3</td><td>1.200</td><td>6.8</td><td>3.000</td><td>10.4</td><td>7.000</td><td>15.6</td></tr><tr><td>0.200</td><td>6.7</td><td>1.400</td><td>7.3</td><td>3.500</td><td>11.2</td><td>7.500</td><td>16.1</td></tr><tr><td>0.300</td><td>7.3</td><td>1.600</td><td>7.7</td><td>4.000</td><td>11.9</td><td>8.000</td><td>16.6</td></tr><tr><td>0.400</td><td>7.5</td><td>1.800</td><td>8.2</td><td>4.500</td><td>12.6</td><td>8.500</td><td>17.1</td></tr><tr><td>0.500</td><td>7.5</td><td>2.000</td><td>8.6</td><td>5.000</td><td>13.2</td><td>9.000</td><td>17.5</td></tr><tr><td>0.600</td><td>7.4</td><td>2.200</td><td>9.0</td><td>5.500</td><td>13.9</td><td>9.500</td><td>18.0</td></tr><tr><td>0.800</td><td>6.8</td><td>2.400</td><td>9.3</td><td>6.000</td><td>14.4</td><td></td><td></td></tr><tr><td>1.000</td><td>6.2</td><td>2.600</td><td>9.7</td><td>6.500</td><td>15.0</td><td></td><td></td></tr></table> <u>Orifice</u> Diameter (m) 0.090 Discharge Coefficient 0.600 Invert Level (m) 27.915			Unit Reference	MD-SHE-0120-7500-1500-7500	Design Head (m)	1.500	Design Flow (l/s)	7.5	Flush-Flo™	Calculated	Objective	Minimise upstream storage	Application	Surface	Sump Available	Yes	Diameter (mm)	120	Invert Level (m)	27.010	Minimum Outlet Pipe Diameter (mm)	150	Suggested Manhole Diameter (mm)	1200	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.500	7.5	Flush-Flo™	0.445	7.5	Kick-Flo®	0.926	6.0	Mean Flow over Head Range	-	6.6	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	4.3	1.200	6.8	3.000	10.4	7.000	15.6	0.200	6.7	1.400	7.3	3.500	11.2	7.500	16.1	0.300	7.3	1.600	7.7	4.000	11.9	8.000	16.6	0.400	7.5	1.800	8.2	4.500	12.6	8.500	17.1	0.500	7.5	2.000	8.6	5.000	13.2	9.000	17.5	0.600	7.4	2.200	9.0	5.500	13.9	9.500	18.0	0.800	6.8	2.400	9.3	6.000	14.4			1.000	6.2	2.600	9.7	6.500	15.0		
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<u>Storage Structures for Storm 26-05-22 Planning</u> <u>Tank or Pond Manhole: S16, DS/PN: S3.007</u> Invert Level (m) 27.317 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>221.1</td><td>1.280</td><td>221.1</td><td>1.281</td><td>0.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	221.1	1.280	221.1	1.281	0.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)									
0.000	221.1	1.280	221.1	1.281	0.0									
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm 26-05-22 Planning

PN	US/MH Name	Water		Surcharged		Flooded		Half Drain		Pipe	
		Level	Depth	Volume	Flow /	Overflow	Time	Flow	Status		
		(m)	(m)	(m³)	Cap.	(l/s)	(mins)	(l/s)			
S1.000		S1 27.740	-0.098	0.000	0.60			15.2	OK		
S1.001	STANK 1 US	27.733	-0.700	0.000	0.01			22.4	OK*		
S1.002	STANK 1 DS	27.732	-0.086	0.000	0.56			16.9	OK*		
S1.003	S2 27.730		-0.080	0.000	0.67			20.6	OK		
S1.004	S3 27.708		-0.055	0.000	0.88			27.2	OK		
S1.005	S4 27.666		-0.119	0.000	0.67			34.4	OK		
S1.006	STANK 2 US	27.639	-0.872	0.000	0.00			34.2	OK*		
S1.007	STANK 2 DS	27.637	-0.123	0.000	0.57			35.0	OK*		
S1.008	S5 27.625		-0.108	0.000	0.73			44.7	OK		
S2.000	S6 27.694		-0.118	0.000	0.45			14.3	OK		
S2.001	STANK 3 US	27.587	-0.351	0.000	0.01			12.7	OK*		
S2.002	STANK 3 DS	27.586	-0.231	0.000	0.12			7.4	OK*		
S2.003	S7 27.583		-0.225	0.000	0.12			6.8	OK		
S2.004	STANK 4 US	27.582	-0.337	0.000	0.01			6.6	OK*		
S2.005	STANK 4 ND	27.582	-0.336	0.000	0.01			4.6	OK*		
S2.006	STANK 4 DS	27.582	-0.216	0.000	0.09			5.3	OK*		
S2.007	S8 27.582		-0.206	0.000	0.09			6.6	OK		

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

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1 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	30 Summer	1	+0%	30/30 Summer		
S1.010	STANK 5 US	360 Winter	1	+0%			
S1.011	STANK 5 DS	360 Winter	1	+0%	30/30 Summer		
S1.012	S11	360 Winter	1	+0%	30/30 Summer		
S1.013	STANK 6 US	360 Winter	1	+0%			
S1.014	STANK 6 DS	360 Winter	1	+0%	30/30 Summer		
S1.015	S12	360 Winter	1	+0%	30/30 Summer		
S1.016	STANK 7 US	360 Winter	1	+0%			
S1.017	STANK 7 DS	360 Winter	1	+0%	30/30 Summer		
S3.000	S13	15 Summer	1	+0%	100/15 Summer		
S3.001	S14	15 Summer	1	+0%	30/15 Summer		
S3.002	STANK 8 US	15 Summer	1	+0%			
S3.003	STANK 8 ND1	15 Summer	1	+0%			
S3.004	STANK 8 DS	15 Summer	1	+0%	30/15 Summer		
S3.005	S14A	15 Summer	1	+0%	30/15 Summer		
S3.006	S15	360 Winter	1	+0%	30/15 Summer		
S3.007	S16	360 Winter	1	+0%	30/30 Summer		
S3.008	STANK 9 US	360 Winter	1	+0%			
S3.009	STANK 9 DS	360 Winter	1	+0%	30/30 Summer		
S3.010	S17	360 Winter	1	+0%	30/30 Summer		
S3.011	STANK 11 US	360 Winter	1	+0%			
S3.012	STANK 11 DS	360 Winter	1	+0%	30/30 Summer		
S3.013	S18	360 Winter	1	+0%	30/30 Summer		
S1.018	S19	360 Winter	1	+0%	30/60 Summer		
S1.019	S20	360 Winter	1	+0%	30/60 Summer		
S1.020	STANK 12 US	360 Winter	1	+0%			
S1.021	STANK 12 ND 1	360 Winter	1	+0%			
S1.022	STANK 12 DS	360 Winter	1	+0%	30/30 Summer		
S1.023	S21	240 Winter	1	+0%	30/30 Summer		
S4.000	SPPCP01	15 Summer	1	+0%	1/15 Summer	100/15 Summer	
S4.001	S22	360 Winter	1	+0%	1/15 Summer		
S1.024	S23	360 Winter	1	+0%	30/15 Summer		
S1.025	S24	240 Winter	1	+0%	1/15 Summer		
S1.026	SInt	30 Summer	1	+0%			
S1.027	S25	15 Winter	1	+0%			

PN	US/MH Name	Overflow Act.	Water			Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
			Level (m)	Depth (m)	Volume (m³)				
S1.009	S10		27.578	-0.170	0.000	0.55			51.3
S1.010	STANK 5 US		27.569	-0.601	0.000	0.00			15.4
S1.011	STANK 5 DS		27.569	-0.136	0.000	0.11			12.0
S1.012	S11		27.569	-0.126	0.000	0.22			18.3
S1.013	STANK 6 US		27.568	-0.576	0.000	0.00			18.2
S1.014	STANK 6 DS		27.568	-0.110	0.000	0.14			14.7
S1.015	S12		27.567	-0.066	0.000	0.22			18.1

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.016	STANK 7 US		27.566	-0.727	0.000	0.00		18.0
S1.017	STANK 7 DS		27.566	-0.051	0.000	0.12		13.4
S3.000	S13		28.343	-0.118	0.000	0.10		2.8
S3.001	S14		27.656	-0.073	0.000	0.78		20.9
S3.002	STANK 8 US		27.600	-0.929	0.000	0.01		20.5
S3.003	STANK 8 ND1		27.600	-0.929	0.000	0.00		17.5
S3.004	STANK 8 DS		27.600	-0.104	0.000	0.56		16.7
S3.005	S14A		27.580	-0.110	0.000	0.51		16.7
S3.006	S15		27.568	-0.045	0.000	0.15		4.8
S3.007	S16		27.567	-0.048	0.000	0.06		3.6
S3.008	STANK 9 US		27.567	-1.001	0.000	0.00		3.5
S3.009	STANK 9 DS		27.567	-0.040	0.000	0.05		3.0
S3.010	S17		27.567	-0.033	0.000	0.07		3.8
S3.011	STANK 11 US		27.566	-0.987	0.000	0.00		4.3
S3.012	STANK 11 DS		27.566	-0.026	0.000	0.05		3.1
S3.013	S18		27.566	-0.072	0.000	0.03		3.1
S1.018	S19		27.565	-0.137	0.000	0.08		17.3
S1.019	S20		27.564	-0.106	0.000	0.09		18.2
S1.020	STANK 12 US		27.563	-0.382	0.000	0.01		17.8
S1.021	STANK 12 ND 1		27.562	-0.382	0.000	0.00		11.4
S1.022	STANK 12 DS		27.561	-0.068	0.000	0.06		16.1
S1.023	S21		27.568	-0.051	0.000	0.05		11.1
S4.000	SPPCP01		27.561	0.186	0.000	0.47		8.0
S4.001	S22		27.559	0.264	0.000	0.11		1.9
S1.024	S23		27.558	-0.007	0.000	0.06		11.8
S1.025	S24		27.554	0.244	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	OK	
S1.010	STANK 5 US	OK*	
S1.011	STANK 5 DS	OK*	
S1.012	S11	OK	
S1.013	STANK 6 US	OK*	
S1.014	STANK 6 DS	OK*	
S1.015	S12	OK	
S1.016	STANK 7 US	OK*	
S1.017	STANK 7 DS	OK*	
S3.000	S13	OK	
S3.001	S14	OK	
S3.002	STANK 8 US	OK*	
S3.003	STANK 8 ND1	OK*	
S3.004	STANK 8 DS	OK*	

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
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S3.005	S14A	OK	
S3.006	S15	OK	
S3.007	S16	OK	
S3.008	STANK 9 US	OK*	
S3.009	STANK 9 DS	OK*	
S3.010	S17	OK	
S3.011	STANK 11 US	OK*	
S3.012	STANK 11 DS	OK*	
S3.013	S18	OK	
S1.018	S19	OK	
S1.019	S20	OK	
S1.020	STANK 12 US	OK*	
S1.021	STANK 12 ND 1	OK*	
S1.022	STANK 12 DS	OK*	
S1.023	S21	OK	
S4.000	SPPCP01	SURCHARGED	3
S4.001	S22	SURCHARGED	
S1.024	S23	OK	
S1.025	S24	SURCHARGED	
S1.026	SInt	OK*	
S1.027	S25	OK	