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Unit 4 Millbank House Riverside Business Park Wilmslow Cheshire SK9 1BJ	Aldi Store Straight Mile Llay,	
Date 01/10/2019 09:50	Designed by PSS	
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Innovyze	Network 2019.1	

Existing Network Details for Existing

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
1.000	14.479	0.335	43.2	0.047	3.00	0.0	0.600		o	150	Pipe/Conduit
2.000	23.085	0.395	58.4	0.040	3.00	0.0	0.600		o	150	Pipe/Conduit
1.001	8.099	-1.735	-4.7	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit
1.002	25.530	0.150	170.2	0.037	0.00	0.0	0.600		o	225	Pipe/Conduit
1.003	37.780	0.150	251.9	0.086	0.00	0.0		0.075 → ↓ →			Porous Car Park
1.004	36.194	0.150	241.3	0.096	0.00	0.0		0.075 → ↓ →			Porous Car Park
1.005	11.407	0.050	228.1	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit
3.000	38.827	0.200	194.1	0.058	3.00	0.0		0.075 → ↓ →			Porous Car Park
3.001	25.867	0.340	76.1	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit
4.000	44.289	0.220	201.3	0.073	3.00	0.0		0.075 → ↓ →			Porous Car Park
3.002	50.672	0.260	194.9	0.123	0.00	0.0		0.075 → ↓ →			Porous Car Park
1.006	6.295	0.050	125.9	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit
5.000	90.000	0.265	339.6	0.208	3.00	0.0	0.600		o	300	Pipe/Conduit
1.007	5.689	0.025	227.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	84.050	0.047	0.0	1.53	27.1
2.000	84.110	0.040	0.0	1.32	23.3
1.001	83.715	0.087	0.0	0.00	0.0
1.002	85.450	0.124	0.0	1.00	39.7
1.003	85.250	0.210	0.0	0.24	1801.2
1.004	85.050	0.306	0.0	0.29	2701.9
1.005	84.850	0.306	0.0	1.04	73.3
3.000	86.300	0.058	0.0	0.24	777.5
3.001	86.050	0.058	0.0	1.15	20.4
4.000	85.930	0.073	0.0	0.23	998.9
3.002	85.660	0.254	0.0	0.28	2160.6
1.006	84.800	0.560	0.0	1.61	178.2
5.000	85.015	0.208	0.0	0.85	59.9
1.007	84.725	0.768	0.0	1.20	132.2

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Manhole Schedules for Existing

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SWMH 01	85.350	1.300	Open Manhole	1200	1.000	84.050	150				
ACO	85.410	1.300	Open Manhole	1200	2.000	84.110	150				
PPS	85.800	2.085	Open Manhole	1200	1.001	83.715	150	1.000	83.715	150	
								2.000	83.715	150	
SWMH 02	86.075	0.625	Open Manhole	1200	1.002	85.450	225	1.001	85.450	150	
SWMH 03	86.500	1.250	Open Manhole	1200	1.003	85.250		1.002	85.300	225	
SWMH 04	86.600	1.550	Open Manhole	1200	1.004	85.050		1.003	85.100		
SWMH 05	86.600	1.750	Open Manhole	1200	1.005	84.850	300	1.004	84.900		1150
SWMH 06	87.350	1.050	Open Manhole	1200	3.000	86.300					
SWMH 07	87.350	1.300	Open Manhole	1200	3.001	86.050	150	3.000	86.100		750
SWMH 08	86.930	1.000	Open Manhole	1200	4.000	85.930					
SWMH 09	86.950	1.290	Open Manhole	1200	3.002	85.660		3.001	85.710	150	
								4.000	85.710		
SWMH 10	86.900	2.100	Open Manhole	1350	1.006	84.800	375	1.005	84.800	300	
								3.002	85.400		1315
SWMH 11	86.440	1.425	Open Manhole	1200	5.000	85.015	300				
SWMH 12	87.200	2.475	Open Manhole	1350	1.007	84.725	375	1.006	84.750	375	25
								5.000	84.750	300	
EXTG S1	87.353	2.653	Open Manhole	1200		OUTFALL		1.007	84.700	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SWMH 01	333437.109	356257.586	333437.109	356257.586	Required	
ACO	333441.333	356241.040	333441.333	356241.040	Required	
PPS	333422.879	356254.910	333422.879	356254.910	Required	
SWMH 02	333415.672	356258.604	333415.672	356258.604	Required	
SWMH 03	333403.913	356281.265	333403.913	356281.265	Required	
SWMH 04	333386.511	356314.798	333386.511	356314.798	Required	
SWMH 05	333418.637	356331.469	333418.637	356331.469	Required	
SWMH 06	333361.630	356291.601	333361.630	356291.601	Required	

Aldi Store
Straight Mile
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MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SWMH 07	333343.746	356326.064	333343.746	356326.064	Required	
SWMH 08	333387.639	356278.359	333387.639	356278.359	Required	
SWMH 09	333368.406	356318.254	333368.406	356318.254	Required	
SWMH 10	333413.383	356341.594	333413.383	356341.594	Required	
SWMH 11	333457.018	356267.658	333457.018	356267.658	Required	
SWMH 12	333415.515	356347.517	333415.515	356347.517	Required	
EXTG S1	333417.531	356352.837			No Entry	

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PIPELINE SCHEDULES for Existing

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SWMH 01	85.350	84.050	1.150	Open Manhole	1200
2.000	o	150	ACO	85.410	84.110	1.150	Open Manhole	1200
1.001	o	150	PPS	85.800	83.715	1.935	Open Manhole	1200
1.002	o	225	SWMH 02	86.075	85.450	0.400	Open Manhole	1200
1.003	→ ↓ →		SWMH 03	86.500	85.250	0.150	Open Manhole	1200
1.004	→ ↓ →		SWMH 04	86.600	85.050	0.150	Open Manhole	1200
1.005	o	300	SWMH 05	86.600	84.850	1.450	Open Manhole	1200
3.000	→ ↓ →		SWMH 06	87.350	86.300	0.200	Open Manhole	1200
3.001	o	150	SWMH 07	87.350	86.050	1.150	Open Manhole	1200
4.000	→ ↓ →		SWMH 08	86.930	85.930	0.150	Open Manhole	1200
3.002	→ ↓ →		SWMH 09	86.950	85.660	0.200	Open Manhole	1200
1.006	o	375	SWMH 10	86.900	84.800	1.725	Open Manhole	1350
5.000	o	300	SWMH 11	86.440	85.015	1.125	Open Manhole	1200
1.007	o	375	SWMH 12	87.200	84.725	2.100	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	14.479	43.2	PPS	85.800	83.715	1.935	Open Manhole	1200
2.000	23.085	58.4	PPS	85.800	83.715	1.935	Open Manhole	1200
1.001	8.099	-4.7	SWMH 02	86.075	85.450	0.475	Open Manhole	1200
1.002	25.530	170.2	SWMH 03	86.500	85.300	0.975	Open Manhole	1200
1.003	37.780	251.9	SWMH 04	86.600	85.100	0.400	Open Manhole	1200
1.004	36.194	241.3	SWMH 05	86.600	84.900	0.300	Open Manhole	1200
1.005	11.407	228.1	SWMH 10	86.900	84.800	1.800	Open Manhole	1350
3.000	38.827	194.1	SWMH 07	87.350	86.100	0.400	Open Manhole	1200
3.001	25.867	76.1	SWMH 09	86.950	85.710	1.090	Open Manhole	1200
4.000	44.289	201.3	SWMH 09	86.950	85.710	0.390	Open Manhole	1200
3.002	50.672	194.9	SWMH 10	86.900	85.400	0.410	Open Manhole	1350
1.006	6.295	125.9	SWMH 12	87.200	84.750	2.075	Open Manhole	1350
5.000	90.000	339.6	SWMH 12	87.200	84.750	2.150	Open Manhole	1350
1.007	5.689	227.6	EXTG S1	87.353	84.700	2.278	Open Manhole	1200

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Area Summary for Existing

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.047	0.047	0.047
2.000	-	-	100	0.040	0.040	0.040
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.037	0.037	0.037
1.003	-	-	100	0.086	0.086	0.086
1.004	-	-	100	0.096	0.096	0.096
1.005	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.058	0.058	0.058
3.001	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.073	0.073	0.073
3.002	-	-	100	0.123	0.123	0.123
1.006	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.208	0.208	0.208
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.768	0.768	0.768

Free Flowing Outfall Details for Existing

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.007	EXTG S1	87.353	84.700	84.703	1200	0

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Online Controls for Existing

Pump Manhole: PPS, DS/PN: 1.001, Volume (m³): 3.0

Invert Level (m) 83.715

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	10.0000	1.400	10.0000	2.600	10.0000	3.800	10.0000	5.000	10.0000
0.400	10.0000	1.600	10.0000	2.800	10.0000	4.000	10.0000	5.200	10.0000
0.600	10.0000	1.800	10.0000	3.000	10.0000	4.200	10.0000	5.400	10.0000
0.800	10.0000	2.000	10.0000	3.200	10.0000	4.400	10.0000	5.600	10.0000
1.000	10.0000	2.200	10.0000	3.400	10.0000	4.600	10.0000	5.800	10.0000
1.200	10.0000	2.400	10.0000	3.600	10.0000	4.800	10.0000	6.000	10.0000

Hydro-Brake® Optimum Manhole: SWMH 12, DS/PN: 1.007, Volume (m³): 10.4

Unit Reference MD-SHE-0095-5400-2000-5400
 Design Head (m) 2.000
 Design Flow (l/s) 5.4
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 95
 Invert Level (m) 84.725
 Minimum Outlet Pipe Diameter (mm) 150
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	5.4	Kick-Flo®	0.851	3.6
Flush-Flo™	0.418	4.5	Mean Flow over Head Range	-	4.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	0.800	3.9	2.000	5.4	4.000	7.5	7.000	9.7
0.200	4.1	1.000	3.9	2.200	5.6	4.500	7.9	7.500	10.1
0.300	4.4	1.200	4.3	2.400	5.9	5.000	8.3	8.000	10.4
0.400	4.5	1.400	4.6	2.600	6.1	5.500	8.7	8.500	10.7
0.500	4.5	1.600	4.9	3.000	6.5	6.000	9.0	9.000	11.0
0.600	4.4	1.800	5.1	3.500	7.0	6.500	9.4	9.500	11.3

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Storage Structures for Existing

Porous Car Park Pipe: 1.003

Manning's N	0.075	Width (m)	22.3
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	37.8
Membrane Percolation (mm/hr)	1000	Slope (1:X)	251.9
Max Percolation (l/s)	234.0	Depression Storage (mm)	5
Safety Factor	2.0	Evaporation (mm/day)	3
Porosity	0.30	Membrane Depth (mm)	150
Invert Level (m)	85.250		

Porous Car Park Pipe: 1.004

Manning's N	0.075	Width (m)	22.1
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	36.2
Membrane Percolation (mm/hr)	1000	Slope (1:X)	241.3
Max Percolation (l/s)	222.2	Depression Storage (mm)	5
Safety Factor	2.0	Evaporation (mm/day)	3
Porosity	0.30	Membrane Depth (mm)	150
Invert Level (m)	85.050		

Porous Car Park Pipe: 3.000

Manning's N	0.075	Width (m)	12.0
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	38.8
Membrane Percolation (mm/hr)	1000	Slope (1:X)	194.1
Max Percolation (l/s)	129.4	Depression Storage (mm)	5
Safety Factor	2.0	Evaporation (mm/day)	3
Porosity	0.30	Membrane Depth (mm)	150
Invert Level (m)	86.300		

Porous Car Park Pipe: 4.000

Manning's N	0.075	Width (m)	17.0
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	44.3
Membrane Percolation (mm/hr)	1000	Slope (1:X)	201.3
Max Percolation (l/s)	209.1	Depression Storage (mm)	5
Safety Factor	2.0	Evaporation (mm/day)	3
Porosity	0.30	Membrane Depth (mm)	150
Invert Level (m)	85.930		

Porous Car Park Pipe: 3.002

Manning's N	0.075	Width (m)	22.2
Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	50.7
Membrane Percolation (mm/hr)	1000	Slope (1:X)	194.9
Max Percolation (l/s)	312.5	Depression Storage (mm)	5
Safety Factor	2.0	Evaporation (mm/day)	3
Porosity	0.30	Membrane Depth (mm)	150
Invert Level (m)	85.660		