

PATRICK PARSONS

CREATING PLACES FOR FUTURE GENERATIONS TO THRIVE

Drainage Strategy Addendum in Response to LLFA Planning Condition

Greenway Academy

Horsham, West Sussex

for

REDS10

11215

February 2024

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1.0 Introduction

Patrick Parsons Has been commissioned by REDS10 to aid in discharging condition 3 for the Greenway Academy school development following further correspondence from the Planning Authority.

This report has been produce and is intended as an addendum to the Drainage Strategy report produced by PJCE "*Greenway Academy Drainage Strategy, by PJCE, March 2023, Rev. 04"*

Planning Condition 3 sates that:

"Pre-Commencement Condition: No development shall commence until a drainage strategy detailing the proposed means of foul and surface water disposal has been submitted to and approved in writing by the Local Planning Authority in consultation with Southern Water. The development shall be carried out in accordance with the approved scheme.

Reason: As this matter is fundamental to ensure that the development is properly drained and to comply with Policy 38 of the Horsham District Planning Framework (2015)."

A further letter dated 30 November 2023 from West Sussex County Council (WSCC) as Lead Local Flood Authority (LLFA) Reference **DISC/23/0241 - Greenway Academy, Greenway, Horsham, West Sussex, RH12 2JS,** notes that it cannot discharge condition 3 based the current information provided.

The letter states:

"We are concerned that the Drainage Strategy does not include enough evidence to demonstrate that the proposed development will be safe for its lifetime and not increase flood risk elsewhere. We would expect full network drainage calculations to be provided to demonstrate appropriate storage volume has been included and that there is no flooding in the 3.33% event plus climate change.

Additionally, we would expect a water quality assessment and an indication of who will be adopting and maintaining the SuDS features for the lifetime of the development."

The LLFA it goes on to say:

"We will consider reviewing this objection if the following issues are adequately addressed.

1. *FEH2022 network drainage calculations should be provided for the following return periods:*
   - *50% AEP event, demonstrating that the network does not surcharge for this event.*
   - *3.33% AEP event plus climate change, demonstrating that there is no flooding outside of the drainage network which is designed to hold water.*
   - *1% AEP event plus climate change, demonstrating that no flooding leaves the application boundary and that there is no flooding of any part of a building, utility plant susceptible to water (e.g. pumping station or substation) within the development boundary. Any above ground flooding (extent and depth) must be shown on a drawing with proposed external ground levels and proposed finished floor levels of buildings*

and should be designed to be held in the least vulnerable areas of the site e.g. open space.

2. *A water quality assessment should be provided, in accordance with the simple index approach from the CIRIA SuDS Manual.*
3. *The Drainage Strategy indicates the maintenance requirements for the proposed SuDS features, however it should also indicate who will be adopting and maintaining the SuDS features for the lifetime of the development.*
4. *Flood resistance and resilience must be shown to be included in the design. A minimum of 300mm must be provided between the design flood event and the finished floor level and a minimum of 150mm above external ground levels should be provided and shown that they are sloping away from vulnerable areas such as doorways.*
5. *Exceedance of the design 1% AEP event plus climate change must be shown on a drawing, minimising impacts to people and property. This drawing will include proposed external ground levels, finished floor levels and any designed slopes on impermeable surfaces such as highways or car parks."*

This Addendum Report Addresses the above raised concerns by the LLFA and to aid in discharging the pre commencement condition 3.

2.0 FEH 22 Modelling

2.1 Patrick Parsons has produced a new model for the below ground surface water drainage using Causeway Flow Hydraulic modelling software.

2.2 The model is based on the principles set out in the PJCD drainage strategy and used FEH 22 Rainfall Data for analysis of surface water below ground drainage.

2.3 The Model has been analysed for the 1 in 2-year storm even, 1 in 30-year storm event + 40% allowance for Climate Change (CC) and the 1 in 100-year storm event + 45% CC.

2.4 Modelling using the FEH 22 Rainfall data and allowing for CC discharging at the Greenfield runoff rate as calculated by PJCE of 1.64 l/s shows that with replacing 2 orifices with a Hydro-brake, the proposed below ground attenuation tank has had to decrease from 469 m3 to 437m3 to accommodate and have no flooding for all storms up to and including the 1 in 100-year storm event + CC.

2.5 A full set of Causeway Flow results can be found in **Appendix 1** of this report.

3.0 Management and Maintenance

3.1 The maintenance regime for the proposed development will be split into two main categories, SuDS drainage and regular private drainage. Both elements will be the responsibility of the commissioned maintenance and management company.

3.2 Maintenance operations can be divided into the following categories:

- Regular (or routine frequent) - this covers items that are carried out typically with a frequency from monthly to annually. It includes items such as inspection and monitoring, litter removal, grass cutting or other vegetation management, sweeping permeable pavements.
- Infrequent (or routine infrequent) - this covers items that are required typically with a frequency from annually up to 25 years (or possibly greater). It includes items such as wetland vegetation management, silt removal from swales, ponds or wetlands, scarifying and spiking infiltration basins and gravel replacement to filter drains.
- Remedial (or reactive) - this covers maintenance that is not usually required, but may be necessary as a result of vandalism, accidental damage, rainfall that exceeds the design capacity or similar events. Examples include repair of erosion in a swale or repair of permeable surfaces blocked for example by mixing concrete on them.

3.3 *Riparian Responsibility*

3.3.1 If a resident owns land adjoining, above or with a portion of the drainage system running through it, they have certain rights and responsibilities. In legal terms they are a 'riparian owner'. If they rent the land, they should agree with the owner who will manage these rights and responsibilities.

3.3.2 It is recommended that the owner's appointed Management Company handle the maintenance of all underground drainage and all SuDS devices, with the following exceptions:

- Inspecting and cleaning out any surface mounted hard drainage systems (such as channel drains);

- Inspecting and cleaning out (or reporting) SuDS systems on a small scale (such as garden ditches and swales).

3.4 *Allowing for Replacement*

3.4.1 The design life of some SuDS elements and drainage elements of the proposed system is shorter than the predicted design life of the development. Therefore, the design and maintenance regime considers any potential replacement works (such as replacing permeable paving).

3.5 The PJCE report in Chapter 14 of their report outlines the General Management and Maintenance that will be required for the upkeep of the below ground drainage network to ensure it remains operational though out the lifetime of the development.

3.6 A more detailed Drainage management and Maintenance regime will be set by the appointed Managing Authority at hand over post completion of the development.

4.0 Water Quality Assessment

4.1 Appropriate pollution control measures will be included in the surface water drainage system to minimise the risk of contamination or pollution entering the public surface water network from surface water runoff from the development.

4.2 The proposed surface water sewer arrangement will incorporate suitable pollution control measures such as catchpit manholes, permeable paving, and Green roofs to manage sediment control and water quality.

4.3 The drainage system will be designed to comply with the requirements of the SuDS treatment sequence as laid out in CIRIA C753 'The SuDS Manual'.

4.4 The SuDS treatment train has been incorporated into the design prior to discharge to Public Surface Water Sewer. As such it has been included into the design of green roofs and Permeable Paving.

4.5 The proposed drainage system has been designed with green roofs, permeable paving which can all play an important part in contributing to a development's SuDS treatment train, providing benefits to each of the four pillars of SuDS design: water quantity, water quality, amenity and biodiversity.

4.6 In accordance with Table 26.2 of the SuDS Manual, the proposed development will have the pollution hazard indices as shown in Table 1 below:

Table 1 Summary of pollution indices for developments

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (commercial/industry)	Low	0.3	0.2	0.05
Carpark with infrequent change (ie < 300)	Low	0.5	0.4	0.4
Total		**0.8**	**0.6**	**0.45**

4.7 Table 2 presents the mitigation indices provided by each SuDS method proposed as part of the drainage strategy.

Table 2 SuDS mitigation indices for discharge to surface waters

SuDS Measure	TSS	Metals	Hydrocarbons
Rainwater gardens/Green roof	0.8	0.8	0.8
Permeable paving	0.7	0.6	0.6
Total	**1.5**	**1.4**	**1.4**

4.8 Based on table 8 and Table 9, the total mitigation indices from the SuDS measures provide sufficient treatment compared to the pollution hazards on the site. Therefore, no proprietary treatments are required.

5.0 External Levels

5.1.1 As noted in the Flood Risk Assessment produced by PJCE, the site sits within Flood Zone 1. The proposed building finished floor level (FFL) is 43.345mAOD. the ground surrounding the school slopes steeply away from the building along the North, West and Southern boundaries. A small portion of hard standing between the existing building to the eastern boundary and the new school building falls towards the proposed school at a slope of 1 in 60.

5.1.2 At detail design stage the levels will be designed so that they fall away from the proposed new school building and towards the soft landscaping proposed in the courtyard that will incorporate positive drainage elements such as filter drains. Additional spot gullies and channel drains will be placed in localised low points within the courtyard to ensure sufficient capacity to drain away the central courtyard.

6.0 Exceedance flows

6.1 An exceedance flow drawing based on the current proposed levels design for the wider site has been produced and can be found in **Appendix B** of this report.

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Appendix H
Hydraulic Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SW10.2		5.00	43.606	450	516567.254	131389.735	0.656
SW10.1	0.137	5.00	43.660	450	516569.096	131376.646	0.810
ATT01 (SW10)			43.603	450	516574.787	131337.086	1.198
SW12	0.031	5.00	43.603	450	516598.146	131322.233	1.028
SW11			43.686	450	516585.236	131327.701	1.206
SW09	0.038	5.00	43.717	450	516560.016	131327.520	1.432
SW08			43.572	450	516545.996	131330.925	1.412
ATT02			43.550	450	516541.344	131333.005	1.430
SW07	0.050	5.00	43.528	1200	516538.293	131326.181	1.433
SW06			43.200	450	516525.441	131332.056	1.200
SW01(3)	0.019	5.00	43.400	450	516494.700	131345.625	1.624
SW01.1	0.031	5.00	43.400	450	516543.449	131352.299	0.515
SW01	0.068	5.00	43.400	450	516528.602	131358.820	0.623
SW02	0.073	5.00	43.283	450	516539.525	131388.631	0.717
SW03	0.012	5.00	42.956	450	516513.483	131398.646	0.838
SW04	0.024	5.00	43.158	450	516503.744	131377.886	1.383
ATT03			42.640	450	516490.693	131347.166	2.190
HB01			42.629	1200	516490.395	131345.737	2.229
SW05			42.181	450	516486.303	131339.837	1.829
MH 4352			41.490	450	516467.004	131338.899	1.360

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	120	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	45	0	0

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Node SW07 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	42.095	Product Number	CTL-SHE-0051-1200-1000-1200
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.2	Min Node Diameter (mm)	1200

Node HB01 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	40.400	Product Number	CTL-SHE-0050-1600-2100-1600
Design Depth (m)	2.100	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.6	Min Node Diameter (mm)	1200

Node ATT01 (SW10) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	42.405	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.750
Safety Factor	2.0	Width (m)	23.000	Inf Depth (m)	
Porosity	0.30	Length (m)	37.000		

Node ATT02 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	42.120	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	1.400
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	9.000		

Node ATT03 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	40.450	Depth (m)	1.600
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	30.000	Number Required	1
Porosity	0.95	Pit Length (m)	5.000		

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)		Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)		Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m^3)	
Full Bore Velocity	✓		

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Results for 2 year Critical Storm Duration. Lowest mass balance: 97.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW10.2	1	42.950	0.000	0.0	0.0000	0.0000	OK
15 minute winter	SW10.1	10	42.936	0.086	19.3	0.0137	0.0000	OK
360 minute winter	ATT01 (SW10)	344	42.627	0.222	4.9	25.4527	0.0000	OK
15 minute winter	SW12	10	42.633	0.058	4.4	0.0093	0.0000	OK
360 minute winter	SW11	344	42.627	0.147	0.8	0.0233	0.0000	OK
360 minute winter	SW09	344	42.627	0.342	3.0	0.0543	0.0000	SURCHARGED
360 minute winter	SW08	344	42.627	0.467	2.3	0.0742	0.0000	SURCHARGED
360 minute winter	ATT02	344	42.627	0.507	2.1	6.6189	0.0000	SURCHARGED
360 minute winter	SW07	344	42.627	0.532	1.3	0.6013	0.0000	SURCHARGED
1440 minute summer	SW06	1560	42.027	0.027	1.0	0.0044	0.0000	OK
15 minute winter	SW01(3)	10	41.793	0.017	3.7	0.0028	0.0000	OK
15 minute winter	SW01.1	10	42.941	0.056	4.4	0.0089	0.0000	OK
15 minute winter	SW01	10	42.857	0.080	13.9	0.0127	0.0000	OK
15 minute winter	SW02	10	42.650	0.084	23.9	0.0134	0.0000	OK
15 minute winter	SW03	11	42.210	0.092	25.2	0.0146	0.0000	OK
15 minute winter	SW04	10	41.857	0.082	28.6	0.0131	0.0000	OK
1440 minute winter	ATT03	1560	40.899	0.449	4.4	64.0208	0.0000	SURCHARGED
1440 minute winter	HB01	1560	40.898	0.498	6.2	0.5635	0.0000	SURCHARGED
1440 minute winter	SW05	690	40.372	0.020	1.0	0.0031	0.0000	OK
1440 minute winter	MH 4352	690	40.150	0.020	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW10.2	1.000	SW10.1	0.0	0.000	0.000	0.0676	
15 minute winter	SW10.1	1.001	ATT01 (SW10)	19.1	1.383	0.163	0.5854	
360 minute winter	ATT01 (SW10)	1.002	SW09	1.9	0.405	0.021	1.1120	
15 minute winter	SW12	2.000	SW11	4.3	0.731	0.297	0.0831	
360 minute winter	SW11	2.001	SW09	0.7	0.177	0.044	0.4428	
360 minute winter	SW09	1.003	SW08	2.3	0.465	0.048	0.5738	
360 minute winter	SW08	1.004	ATT02	2.1	0.352	0.046	0.2027	
360 minute winter	ATT02	1.005	SW07	0.9	0.098	0.030	0.2973	
360 minute winter	SW07	Hydro-Brake®	SW06	1.0				
1440 minute summer	SW06	1.007	SW01(3)	1.0	0.667	0.024	0.0566	
15 minute winter	SW01(3)	1.008	ATT03	3.7	2.934	0.012	0.0355	
15 minute winter	SW01.1	3.000	SW01	4.3	0.557	0.299	0.1261	
15 minute winter	SW01	3.001	SW02	13.6	0.876	0.151	0.4962	
15 minute winter	SW02	3.002	SW03	23.6	1.379	0.167	0.4792	
15 minute winter	SW03	3.003	SW04	25.4	1.525	0.187	0.3849	
15 minute winter	SW04	3.004	ATT03	29.2	2.889	0.131	0.3992	
1440 minute winter	ATT03	1.009	HB01	6.2	0.286	0.031	0.1090	
1440 minute winter	HB01	Hydro-Brake®	SW05	1.0				
1440 minute winter	SW05	1.011	MH 4352	1.0	0.513	0.008	0.0371	73.3

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 97.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW10.2	10	43.024	0.074	1.1	0.0118	0.0000	OK
15 minute winter	SW10.1	10	43.026	0.176	70.6	0.0279	0.0000	OK
720 minute winter	ATT01 (SW10)	705	42.996	0.591	9.0	119.4057	0.0000	SURCHARGED
720 minute winter	SW12	705	42.996	0.421	1.3	0.0669	0.0000	SURCHARGED
720 minute winter	SW11	705	42.996	0.516	1.3	0.0820	0.0000	SURCHARGED
720 minute winter	SW09	705	42.996	0.711	3.4	0.1130	0.0000	SURCHARGED
720 minute winter	SW08	705	42.996	0.836	1.5	0.1329	0.0000	SURCHARGED
720 minute winter	ATT02	705	42.996	0.876	1.5	11.6595	0.0000	SURCHARGED
720 minute winter	SW07	705	42.996	0.901	2.1	1.0186	0.0000	SURCHARGED
600 minute winter	SW06	600	42.029	0.029	1.1	0.0046	0.0000	OK
15 minute winter	SW01(3)	10	41.805	0.029	10.7	0.0046	0.0000	OK
15 minute winter	SW01.1	10	43.101	0.216	16.0	0.0344	0.0000	FLOOD RISK
15 minute winter	SW01	10	42.946	0.169	50.5	0.0269	0.0000	OK
15 minute winter	SW02	10	42.747	0.181	87.5	0.0288	0.0000	OK
15 minute winter	SW03	11	42.318	0.200	92.2	0.0319	0.0000	OK
15 minute winter	SW04	10	41.926	0.151	104.2	0.0241	0.0000	OK
1440 minute winter	ATT03	1440	41.711	1.261	6.5	179.9381	0.0000	SURCHARGED
1440 minute winter	HB01	1440	41.710	1.310	3.6	1.4821	0.0000	SURCHARGED
1440 minute winter	SW05	1440	40.374	0.022	1.3	0.0035	0.0000	OK
1440 minute winter	MH 4352	1440	40.152	0.022	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW10.2	1.000	SW10.1	-1.1	-0.122	-0.069	0.1737	
15 minute winter	SW10.1	1.001	ATT01 (SW10)	70.2	1.844	0.599	1.8742	
720 minute winter	ATT01 (SW10)	1.002	SW09	-3.4	0.368	-0.037	1.2405	
720 minute winter	SW12	2.000	SW11	1.3	0.367	0.087	0.2468	
720 minute winter	SW11	2.001	SW09	1.2	0.162	0.079	0.4440	
720 minute winter	SW09	1.003	SW08	1.5	0.492	0.031	0.5738	
720 minute winter	SW08	1.004	ATT02	1.5	0.363	0.032	0.2027	
720 minute winter	ATT02	1.005	SW07	1.1	0.110	0.038	0.2973	
720 minute winter	SW07	Hydro-Brake®	SW06	1.1				
600 minute winter	SW06	1.007	SW01(3)	1.1	0.691	0.027	0.0609	
15 minute winter	SW01(3)	1.008	ATT03	10.7	3.313	0.036	0.0850	
15 minute winter	SW01.1	3.000	SW01	15.5	0.882	1.074	0.2855	
15 minute winter	SW01	3.001	SW02	49.9	1.178	0.552	1.3545	
15 minute winter	SW02	3.002	SW03	86.0	1.831	0.610	1.3100	
15 minute winter	SW03	3.003	SW04	92.6	2.201	0.681	0.9766	
15 minute winter	SW04	3.004	ATT03	106.1	3.348	0.477	1.5567	
1440 minute winter	ATT03	1.009	HB01	3.6	0.288	0.018	0.1090	
1440 minute winter	HB01	Hydro-Brake®	SW05	1.3				
1440 minute winter	SW05	1.011	MH 4352	1.3	0.558	0.011	0.0449	97.1

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	SW10.2	705	43.490	0.540	0.1	0.0859	0.0000	FLOOD RISK
720 minute winter	SW10.1	705	43.490	0.640	7.4	0.1018	0.0000	FLOOD RISK
720 minute winter	ATT01 (SW10)	705	43.490	1.085	12.0	160.2580	0.0000	FLOOD RISK
720 minute winter	SW12	705	43.490	0.915	1.7	0.1455	0.0000	FLOOD RISK
720 minute winter	SW11	705	43.490	1.010	1.7	0.1606	0.0000	FLOOD RISK
720 minute winter	SW09	705	43.490	1.205	4.6	0.1916	0.0000	FLOOD RISK
720 minute winter	SW08	705	43.490	1.330	2.0	0.2115	0.0000	FLOOD RISK
720 minute winter	ATT02	705	43.490	1.370	1.7	18.4123	0.0000	FLOOD RISK
720 minute winter	SW07	705	43.490	1.395	2.7	1.5778	0.0000	FLOOD RISK
1440 minute winter	SW06	1440	42.051	0.051	1.3	0.0081	0.0000	OK
1440 minute winter	SW01(3)	1440	42.051	0.275	1.7	0.0437	0.0000	SURCHARGED
15 minute winter	SW01.1	10	43.241	0.356	20.9	0.0566	0.0000	FLOOD RISK
15 minute winter	SW01	10	42.980	0.203	65.9	0.0323	0.0000	OK
15 minute winter	SW02	10	42.789	0.223	114.1	0.0354	0.0000	OK
15 minute winter	SW03	11	42.366	0.248	120.6	0.0395	0.0000	OK
1440 minute winter	SW04	1350	42.055	0.280	6.7	0.0445	0.0000	OK
1440 minute winter	ATT03	1350	42.051	1.600	8.4	228.3077	0.0000	SURCHARGED
1440 minute winter	HB01	1470	42.050	1.650	3.6	1.8658	0.0000	SURCHARGED
1440 minute winter	SW05	1440	40.375	0.023	1.4	0.0037	0.0000	OK
1440 minute winter	MH 4352	1440	40.153	0.023	1.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	SW10.2	1.000	SW10.1	-0.1	-0.007	-0.004	0.2327	
720 minute winter	SW10.1	1.001	ATT01 (SW10)	7.4	0.514	0.063	2.8147	
720 minute winter	ATT01 (SW10)	1.002	SW09	-4.6	0.391	-0.050	1.2405	
720 minute winter	SW12	2.000	SW11	1.7	0.337	0.113	0.2468	
720 minute winter	SW11	2.001	SW09	1.6	0.187	0.103	0.4440	
720 minute winter	SW09	1.003	SW08	2.0	0.526	0.040	0.5738	
720 minute winter	SW08	1.004	ATT02	1.7	0.341	0.037	0.2027	
720 minute winter	ATT02	1.005	SW07	-1.6	0.082	-0.054	0.2973	
720 minute winter	SW07	Hydro-Brake®	SW06	1.4				
1440 minute winter	SW06	1.007	SW01(3)	1.5	0.674	0.035	0.7812	
1440 minute winter	SW01(3)	1.008	ATT03	2.2	1.618	0.007	0.1598	
15 minute winter	SW01.1	3.000	SW01	20.2	1.147	1.398	0.2855	
15 minute winter	SW01	3.001	SW02	65.1	1.225	0.720	1.6970	
15 minute winter	SW02	3.002	SW03	112.5	1.903	0.798	1.6469	
15 minute winter	SW03	3.003	SW04	121.0	2.304	0.889	1.2050	
1440 minute winter	SW04	3.004	ATT03	6.7	0.864	0.030	2.3094	
1440 minute winter	ATT03	1.009	HB01	3.6	0.241	0.018	0.1090	
1440 minute winter	HB01	Hydro-Brake®	SW05	1.4				
1440 minute winter	SW05	1.011	MH 4352	1.4	0.576	0.012	0.0483	105.0

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