

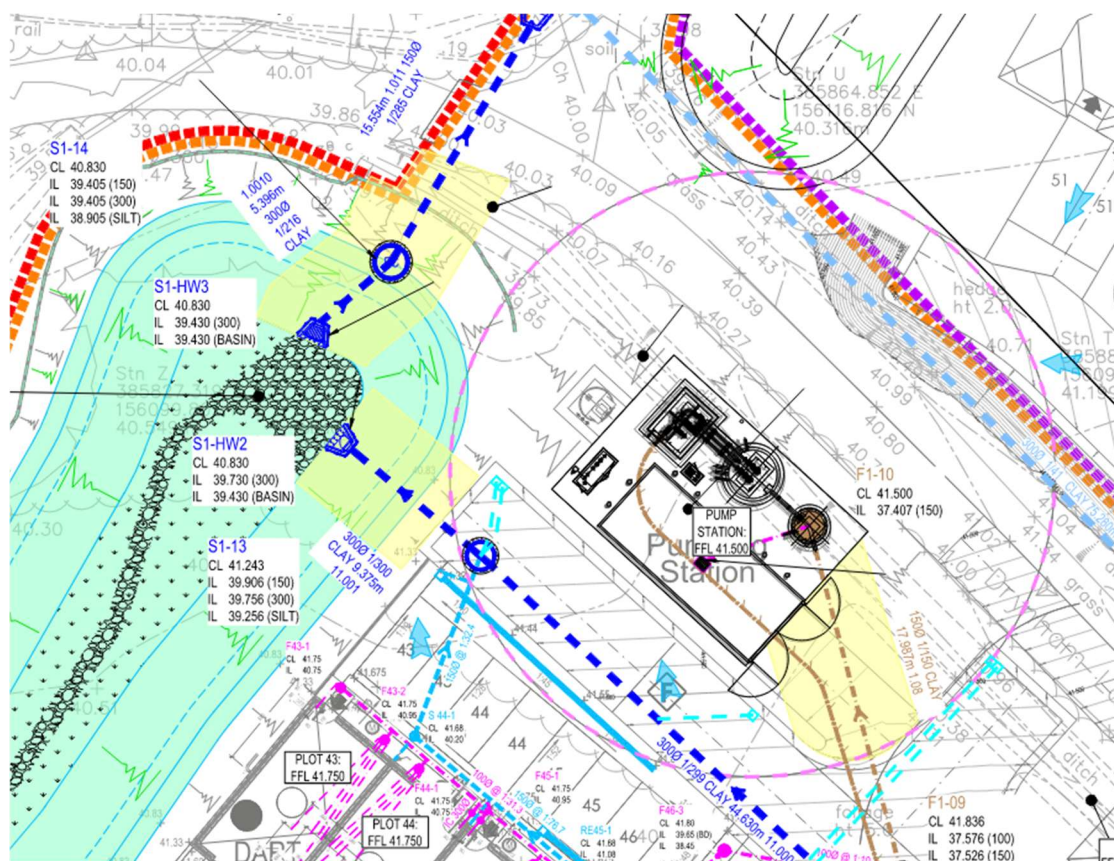
Project:	1960 - Elm Grove, Trowbridge		
Technical Note:	Technical Note - Phase 1 Basin		
Date:	28/01/2026	Originator:	David WJ Patterson

Introduction

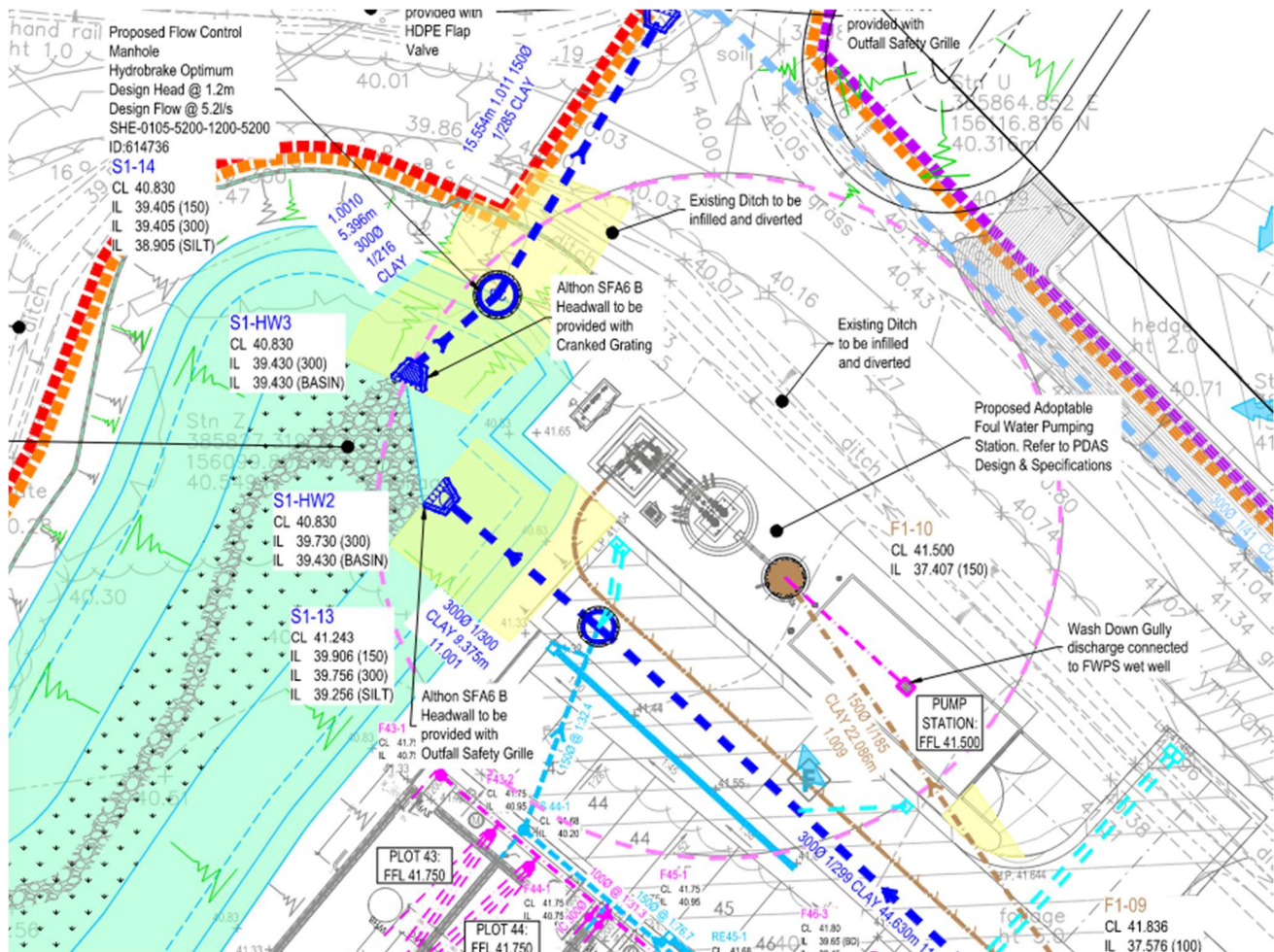
JRC were requested to provide details and supporting information relating to the planning updates to the FWPS and Basin adjustments in the Phase 1 development area of the Elm Grove, Trowbridge site.

Foul Water Pumping Station & Phase 1 Basin Updates

Following additional review of the proposed site layout and key constraints it was required that the FWPS needed to be reconfigured. In consultation with ICOSA / LastMile the arrangement was adjusted to a single "in line system" which moved the compound area away from the boundary with Drynham Lane.



Project:	1960 - Elm Grove, Trowbridge		
Technical Note:	Technical Note - Phase 1 Basin		
Date:	28/01/2026	Originator:	David WJ Patterson

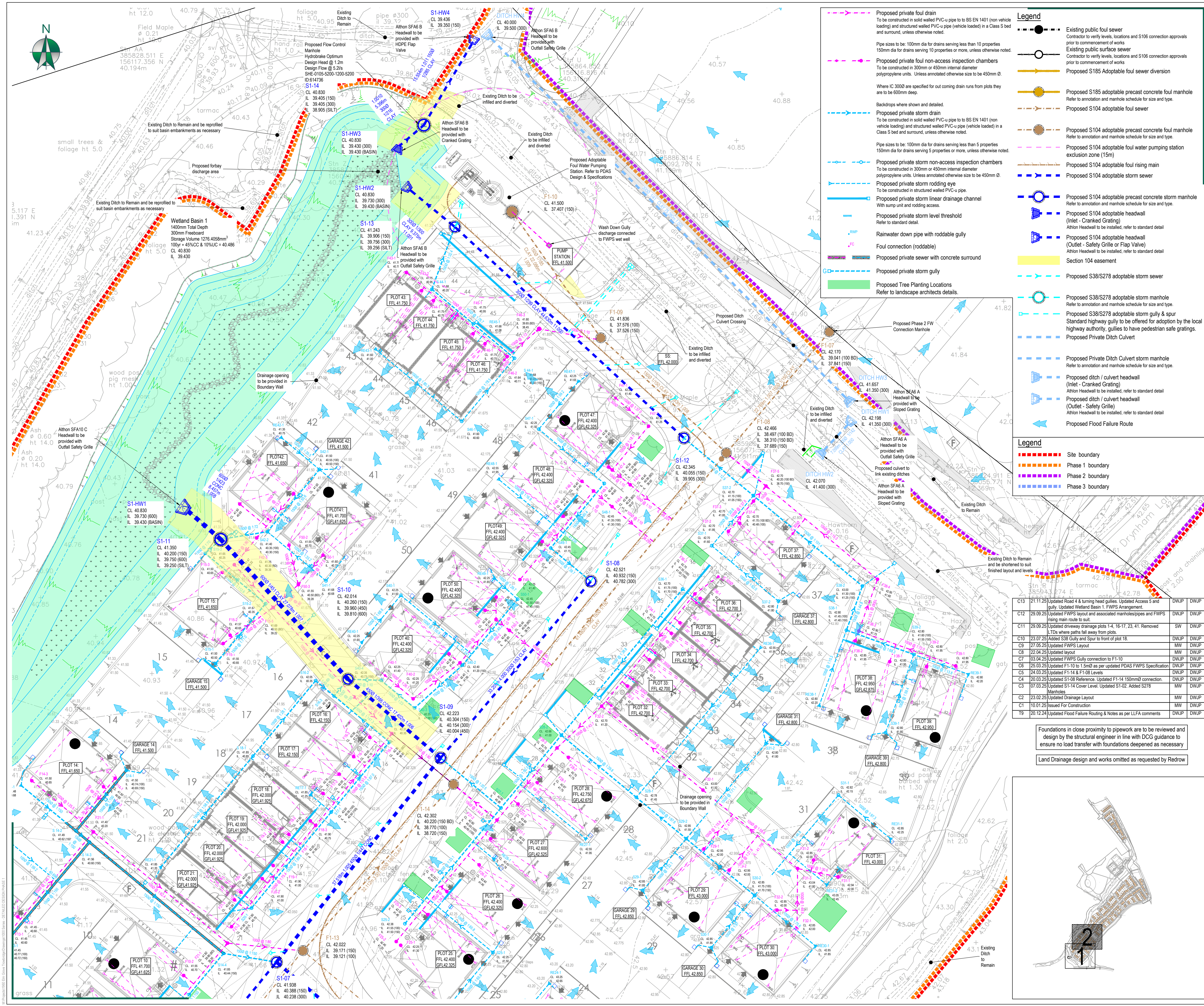


Proposed Revised Arrangement

The result of the change in configuration of the FWPS is that a corner section of the Phase 1 Basin will be needed to be adjusted and reprofiled.

The changes in the Phase 1 Basin have been modelled and hydraulically reviewed. The updated calculations are appended to this Technical Note for reference and show that the basin remains in compliance with the critical design storms up to the 1 in 100 + 40% with a maintained peak discharge rate of 5.2l/s all in line with the original Flood Risk Assessment and Drainage Strategy.

The FWPS and Phase 1 Basin arrangement and updates have already been Technically Approved by ICOSA/LastMile for adoption under a S104 agreement.



Proposed private foul drain
To be constructed in solid wall PVC-u pipe to BS EN 1401 (non vehicle loading) and structured wall PVC-u pipe (vehicle loaded) in a Class S bed and surround, unless otherwise noted.

Pipe sizes to be: 100mm dia for drains serving less than 10 properties
150mm dia for drains serving 10 properties or more, unless otherwise noted.

Proposed private foul non-access inspection chambers
To be constructed in 300mm or 450mm internal diameter polypropylene units. Unless annotated otherwise size to be 450mm Ø.

Where IC 3000 are specified for out coming drain runs from plots they are to be 600mm deep.

Backdrops where shown and detailed.

Proposed private storm drain
To be constructed in solid wall PVC-u pipe to BS EN 1401 (non vehicle loading) and structured wall PVC-u pipe (vehicle loaded) in a Class S bed and surround, unless otherwise noted.

Pipe sizes to be: 100mm dia for drains serving less than 5 properties
150mm dia for drains serving 5 properties or more, unless otherwise noted.

Proposed private storm non-access inspection chambers
To be constructed in 300mm or 450mm internal diameter polypropylene units. Unless annotated otherwise size to be 450mm Ø.

Proposed private storm rodding eye
To be constructed in structured wall PVC-u pipe.

Proposed private storm linear drainage channel
With sump unit and rodding access.

Proposed private storm level threshold
Refer to standard detail.

Rainwater down pipe with roddable gully

Foul connection (roddable)

Proposed private sewer with concrete surround

Proposed private storm gully

Proposed Tree Planting Locations
Refer to landscape architects details.

Legend

- Existing public foul sewer
- Existing public surface sewer
- Proposed S185 Adoptable foul sewer diversion
- Proposed S185 adoptable precast concrete foul manhole
- Proposed S104 adoptable foul sewer
- Proposed S104 adoptable precast concrete foul manhole
- Proposed S104 adoptable foul water pumping station
- Proposed S104 adoptable foul rising main
- Proposed S104 adoptable storm sewer
- Proposed S104 adoptable precast concrete storm manhole
- Proposed S104 adoptable headwall (Inlet - Cranked Grating)
- Proposed S104 adoptable headwall (Outlet - Safety Grille or Flap Valve)
- Section 104 easement
- Proposed S38/S278 adoptable storm sewer
- Proposed S38/S278 adoptable storm manhole
- Proposed S38/S278 adoptable storm gully & spur
- Proposed Private Ditch Culvert storm manhole
- Proposed ditch / culvert headwall (Inlet - Cranked Grating)
- Proposed ditch / culvert headwall (Outlet - Safety Grille)
- Proposed Flood Failure Route

Legend

- Site boundary
- Phase 1 boundary
- Phase 2 boundary
- Phase 3 boundary

CDM: Significant Hazards

Health and Safety hazards are identified by the designer as abnormal in pursuance of the current Construction Design and Management regulations. It is assumed that all works will be carried out by competent & adequately resourced contractor(s) working to safe systems of work.

General Notes

- DO NOT SCALE FROM THIS DRAWING FOR CONSTRUCTION. Scaling from this drawing or obtaining dimensions electronically may not provide accurate information and should be avoided. Therefore work only from figure dimensions and contact JRC Consulting Engineers.
- This drawing is to be read in conjunction with all other relevant Architect's, Engineers & Specialist drawings, details, Specification and the relevant Health and Safety Plan (as appropriate to the project). All discrepancies to be reported to the Engineer immediately for verification.

Drainage Notes

- The planning, design and construction of sewers shall be in accordance with Sewers Sector Guidance (SSG) a design and construction guide for developers.
- The minimum size of sewer where guide bars, safety chains, or other safety devices are required in manholes shall be 375mm diameter.
- All type A & B manholes should have a concrete surround. Concrete rings shall be sealed using tuckpointing and lifting eyes pointed with resin modified mortar.
- Compliance with health & safety matters on any trench/manhole is obligatory and a permit to enter a confined space is required when connecting site drainage to the existing public sewerage system. A permit to enter a confined space will be obtained from SWW Ltd prior to the works commencing on any public sewerage system.
- Where the proposed site drainage connects to the public sewerage system either by new junction, new manhole or at an existing manhole, it will require the submission of an application for sewer connection form to SWW Ltd prior to works commencing.
- Mt covers and frames shall be ductile iron with a minimum square opening of 675x675mm. Covers shall be double triangle for 675mm square openings and be provided with loose bolted connections. Frame depth shall be 150mm. Covers to PPICs shall be in accordance with SSG.
- Type C manholes to be provided with 1200 x 688mm covers and opening.
- The use of ladders or steps in manholes, wet wells and valve chambers shall comply with the following: steel plastic encapsulated Mt single steps shall not be used in MHS up to 3.0m deep. Ladders shall be provided in accordance with BS 4211 in MHS between 3.0m & 6.0m deep. MHS greater than 6.0m deep shall be specially designed and have intermediate landings. Access holes in intermediate landings shall be provided with galvanneal mild steel gratings to prevent persons falling through. The design of deep manholes shall permit the use of a winch or lifting gear mounted at ground level in case of emergencies.
- Only low carbon steel or stainless-steel ladders for vertical fixing to manholes will be acceptable.
- Proposed adoptable sewers are only permitted to have other sewer/gully connections and other services laid at an angle of between 45 degrees and 90 degrees across the line with a vertical clearance more than 300mm.
- All ironwork to be kile marked by BSI or certified by equal inspection authority.
- Red coloured plastic marker tape at least 150mm wide shall be laid at a minimum of 200mm above the soffit of the pipe. The tape shall be printed with the words 'gravity sewer' in bold capital letters throughout its length and at intervals not exceeding 700mm and shall incorporate a corrosion resistant tracing system for non-metallic pipes.
- Minimum backdrop height shall be 1m.
- On new drainage schemes, the first manhole upstream from the connection to the existing foul water sewer shall be fitted with a suitable screen, which will remain in place until the new sewer becomes live.

Drainage Notes - DCG

- Drawings to be read in conjunction with all design drawings and building regulations.
- All levels are to be in accordance with Ordnance Survey datum levels.
- All materials used in connection with this design must:
 - Not be detrimental to health & safety or adversely affect durability of the construction.
 - Where applicable, be compliant to current British/European Standards, Codes of Practice and good building practices.
- The planning, design and construction of sewers shall be in accordance with Design and Construction Guidance (DCG) for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies in England.
- The minimum size of sewer where guide bars, safety chains, or other safety devices are required in manholes shall be 375mm diameter.
- All type A & B manholes should have a concrete surround. Concrete rings shall be sealed using tuckpointing and lifting eyes pointed with resin modified mortar. PPICs shall be in accordance with the DCG.
- Compliance with health & safety matters on any trench/manhole is obligatory and a permit to enter a confined space is required when connecting site drainage to the existing public sewerage system. A permit to enter a confined space will be obtained from the local water company prior to the works commencing on any public sewerage system.
- Where the proposed site drainage connects to the public sewerage system either by new junction, new manhole or at an existing manhole, it will require the submission of an application for sewer connection form to the local water company prior to works commencing.
- Mt covers and frames shall be ductile iron with a minimum square opening of 675x675mm. Covers shall be double triangle for 675mm square openings and be provided with loose bolted connections. Frame depth shall be 150mm. Covers to PPICs shall be in accordance with the DCG.
- The use of ladders or steps in manholes, wet wells and valve chambers shall comply with the following: steel plastic encapsulated Mt single steps shall not be used in MHS of a greater depth than 1.0m. Steel plastic encapsulated double steps may be provided in MHS up to 3.0m deep. Ladders shall be provided in accordance with BS 4211 in MHS between 3.0m & 6.0m deep. MHS greater than 6.0m deep shall be specially designed and have intermediate landings. Access holes in intermediate landings shall be provided with galvanneal mild steel gratings to prevent persons falling through. The design of deep manholes shall permit the use of a winch or lifting gear mounted at ground level in case of emergencies.
- Only low carbon steel or stainless-steel ladders for vertical fixing to manholes will be acceptable.
- Proposed adoptable sewers are only permitted to have other sewer/gully connections and other services laid at an angle of between 45 degrees and 90 degrees across the line with a vertical clearance more than 300mm.
- Red coloured plastic marker tape at least 150mm wide shall be laid at a minimum of 200mm above the soffit of the pipe. The tape shall be printed with the words 'gravity sewer' in bold capital letters throughout its length and at intervals not exceeding 700mm and shall incorporate a corrosion resistant tracing system for non-metallic pipes.
- Minimum backdrop height shall be 1m.
- On new drainage schemes, the first manhole upstream from the connection to the existing foul water sewer shall be fitted with a suitable screen, which will remain in place until the new sewer becomes live. For type 3 manholes, outlet to be bunged with suitable stopper and chain which can be removed on completion of work.

Adopted pipework bed/surround:

Vehicular access:	<1200 cover	Class Z concrete
Non-vehicular access:	>1200 cover	Class S granular
	>900 cover	Class Z concrete
	>900 cover	Class S granular

Foundations in close proximity to pipework are to be reviewed and design by the structural engineer in line with DCG guidance to ensure no load transfer with foundations deepened as necessary

Land Drainage design and works omitted as requested by Redrow

C13	21.11.25	Updated Road 4 & turning head gullies. Updated Access 5 and gully. Updated Wetland Basin 1, FWPS Arrangement.	DWJP	DWJP
C12	29.09.25	Updated FWPS layout and associated manholes/pipes and FWPS. Issuing main route to suit.	DWJP	DWJP
C11	29.09.25	Updated driveway drainage plots 1-4, 16-17, 23, 41. Removed LTDs where paths fall away from plots.	SW	DWJP
C10	23.07.25	Added S38 Gully and Spur to front of plot 18.	DWJP	DWJP
C9	27.05.25	Updated FWPS Layout	MW	DWJP
C8	22.05.25	Updated layout	DWJP	DWJP
C7	03.04.25	Updated FWPS Gully connection to F1-10.	DWJP	DWJP
C6	25.03.25	Updated F1-10 to 1.5m/s as per updated PDAS FWPS Specification	DWJP	DWJP
C5	24.03.25	Updated F1-14 & F1-08 Levels	DWJP	DWJP
C4	20.03.25	Updated S1-08 Reference. Updated F1-14 150mm/d connection.	DWJP	DWJP
C3	07.03.25	Updated S1-14 Cover Level. Updated S1-02. Added S278	MW	DWJP
C2	23.02.25	Updated Drainage Layout	MW	DWJP
C1	10.01.25	Issued For Construction	MW	DWJP
19	20.12.24	Updated Flood Failure Routing & Notes as per LLFA comments	DWJP	DWJP

T8	08.10.24	Tree Pit Hatch updated. Amended Private Foul Run by S1-09 SIC22-1 to SIC2202 updated to 150mm	TH	DWJP
T7	01.10.24	Updated Drainage arrangement and details	TH	DWJP
T6	11.09.24	Updated Aithon Headwall & Culvert information	TH	DWJP
T5	10.09.24	Drawing scale adjusted to 1:250 & private drainage amended to suit new FFL's	TH	DWJP
T4	05.08.24	Updated following comments from PDAS	HR	DWJP
T3	18.07.24	Plot 3 44 - 46 private drainage amended to suit FFL changes	RE	JRC
T2	21.06.24	Private drainage around plots 17 & 16 amended to suit new position	RE	JRC
T1	19.06.24	Issued for TENDER APPROVAL	RE	JRC

REV.	DATE	DETAILS	BY	CHKD.

JRC CONSULTING

Exeter Office: 01392 927330 Web: www.jrcconsulting.co.uk
Bideford Office: 01272 523339

DRAWING STATUS

FOR CONSTRUCTION

PROJECT

ELM GROVE TROWBRIDGE

CLIENT

REDROW

DRAWING TITLE

DRAINAGE LAYOUT PHASE 1 SHEET 2

SCALE @ A1

0m 1:250 10m

SIZE

A1

DATE

JUN 24

PROJECT NUMBER	DRAWING NUMBER	REVISION
1960	1502	C13

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S278-02	0.043	1.500	Type B	43.650	41.050	2.375	385962.887	155882.274
S278-01	0.060	1.500	Type B	43.500	41.500	1.775	385846.928	155885.953
S1-02	0.071	1.500	Type B	42.809	40.760	1.824	385898.015	155885.937
S1-03	0.010	1.500	Type B	43.527	40.616	2.687	385898.357	155918.280
S1-04	0.028	1.500	Type B	43.603	40.543	2.835	385895.814	155934.520
S22-3	0.000	0.450	Type E	43.420	41.950	1.320	385883.049	155959.889
S1-1	0.000	0.450	Unknown	43.870	41.000	2.720	385874.765	155946.110
S1-05	0.229	1.500	Type B	43.080	40.227	2.403	385876.854	155952.484
S6-2	0.000	0.450	Type E	41.850	40.610	1.090	385806.636	155945.330
S1-06	0.145	1.500	Type C	41.499	40.408	0.791	385802.198	155951.204
S14-4	0.000	0.450	Type E	41.850	40.440	1.260	385825.634	155990.371
S1-07	0.155	1.500	Type C	41.938	40.088	1.400	385833.198	155989.125
S49-1	0.000	0.450	Type E	42.450	41.150	1.150	385872.470	156048.434
S1-08	0.208	1.500	Type C	42.521	40.782	1.439	385878.215	156043.666
S1-09	0.121	1.500	Type B	42.223	40.004	1.769	385856.699	156018.371
S16-3	0.000	0.450	Type E	42.100	40.280	1.670	385841.453	156027.248
S1-10	0.014	1.500	Type B	42.014	39.810	1.604	385843.444	156029.646
S42-2	0.000	0.450	Type E	41.400	40.300	0.950	385831.902	156050.776
S15-3	0.000	0.450	Type E	41.650	40.250	1.250	385823.014	156047.674
S1-11	0.000	1.500	Type C	41.350	39.750	1.000	385825.223	156049.677
S1-HW1	0.039	0.000	Unknown	40.830	39.430	0.500	385818.678	156055.033
S1-12	0.154	1.500	Type B	42.345	39.905	2.140	385891.547	156064.188
S44-1	0.000	0.450	Type E	41.680	40.200	1.330	385855.457	156085.505
S1-13	0.030	1.500	Type C	41.243	39.756	1.187	385858.735	156094.440
S1-HW2	0.000	0.000	Unknown	40.830	39.430	1.100	385851.498	156100.400
S1-HW3	0.000	0.000	Unknown	40.830	39.430	1.100	385849.855	156105.242
S1-14	0.000	1.800	Type C	40.830	39.405	1.275	385854.300	156109.009
S1-HW4	0.000	0.000	Unknown	39.532	39.350	0.032	385862.346	156122.322

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S278-02	41.050	S1-02	40.760	Circ	0.225mØ	64.975	224.1	0.600	2.375	1.824
2.000	S278-01	41.500	S1-02	41.270	Circ	0.225mØ	51.087	222.1	0.600	1.775	1.314
1.001	S1-02	40.760	S1-03	40.616	Circ	0.225mØ	32.345	224.1	0.600	1.824	2.687
1.002	S1-03	40.616	S1-04	40.543	Circ	0.225mØ	16.438	225.0	0.600	2.687	2.835
1.003	S1-04	40.543	S1-05	40.452	Circ	0.225mØ	26.119	288.3	0.600	2.835	2.403
3.000	S22-3	41.950	S1-05	41.727	Circ	0.15mØ	9.655	43.3	0.600	1.320	1.203
4.000	S1-1	41.000	S1-05	40.527	Circ	0.15mØ	6.708	14.2	0.600	2.720	2.403
1.004	S1-05	40.227	S1-07	40.088	Circ	0.45mØ	56.995	408.8	0.600	2.403	1.400
5.000	S6-2	40.610	S1-06	40.558	Circ	0.15mØ	7.362	141.6	0.600	1.090	0.791
5.001	S1-06	40.408	S1-07	40.238	Circ	0.3mØ	48.979	288.1	0.600	0.791	1.400
6.000	S14-4	40.440	S1-07	40.388	Circ	0.15mØ	7.666	147.4	0.600	1.260	1.400
1.005	S1-07	40.088	S1-09	40.004	Circ	0.45mØ	37.518	446.6	0.600	1.400	1.769
7.000	S49-1	41.150	S1-08	40.932	Circ	0.15mØ	7.466	34.2	0.600	1.150	1.439
7.001	S1-08	40.782	S1-09	40.154	Circ	0.3mØ	33.209	52.9	0.600	1.439	1.769
1.006	S1-09	40.004	S1-10	39.960	Circ	0.45mØ	17.402	395.5	0.600	1.769	1.604
8.000	S16-3	40.280	S1-10	40.260	Circ	0.15mØ	3.116	155.8	0.600	1.670	1.604
1.007	S1-10	39.810	S1-11	39.750	Circ	0.6mØ	27.078	451.3	0.600	1.604	1.000
9.000	S42-2	40.300	S1-11	40.200	Circ	0.15mØ	6.769	67.7	0.600	0.950	1.000
10.000	S15-3	40.250	S1-11	40.200	Circ	0.15mØ	2.982	59.6	0.600	1.250	1.000
1.008	S1-11	39.750	S1-HW1	39.730	Circ	0.6mØ	8.457	422.9	0.600	1.000	0.500
1.009	S1-HW1	39.430	S1-HW3	39.430	Circ	0.9mØ	59.101		0.600	0.500	0.500
11.000	S1-12	39.905	S1-13	39.756	Circ	0.3mØ	44.630	299.2	0.600	2.140	1.187
12.000	S44-1	40.200	S1-13	39.906	Circ	0.15mØ	9.517	32.4	0.600	1.330	1.187
11.001	S1-13	39.756	S1-HW2	39.730	Circ	0.3mØ	9.375	360.6	0.600	1.187	0.800
11.002	S1-HW2	39.430	S1-HW3	39.430	Circ	0.3mØ	5.113		0.600	1.100	1.100
1.010	S1-HW3	39.430	S1-14	39.405	Circ	0.3mØ	5.828	233.1	0.600	1.100	1.125
1.011	S1-14	39.405	S1-HW4	39.350	Circ	0.15mØ	15.554	282.8	0.600	1.275	0.032

Outfall Details

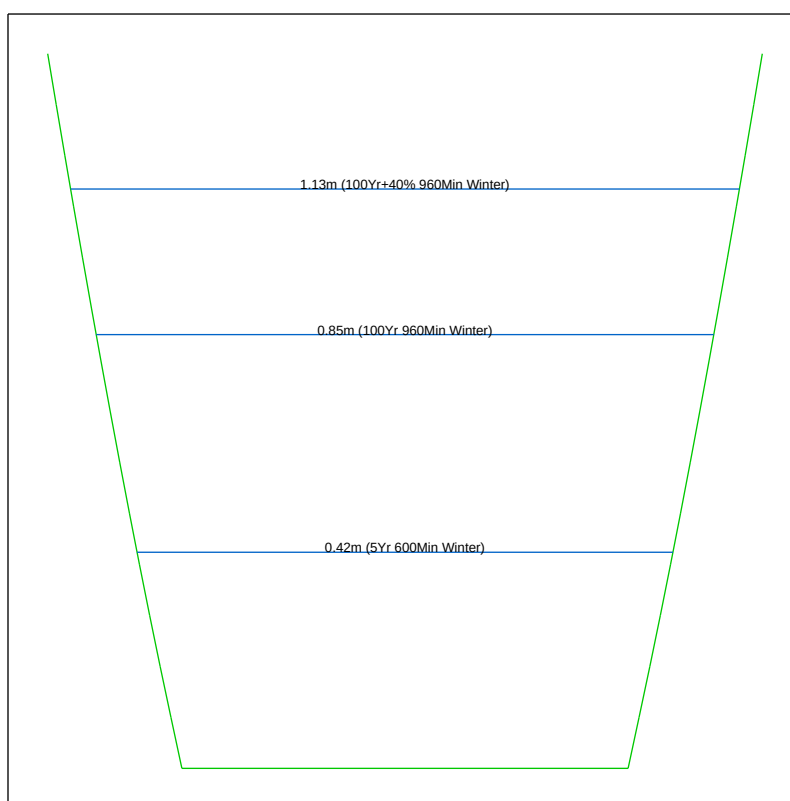
Outfall Manhole S1-HW4 (OUTFALL) : Free Discharge

Flow Control Details

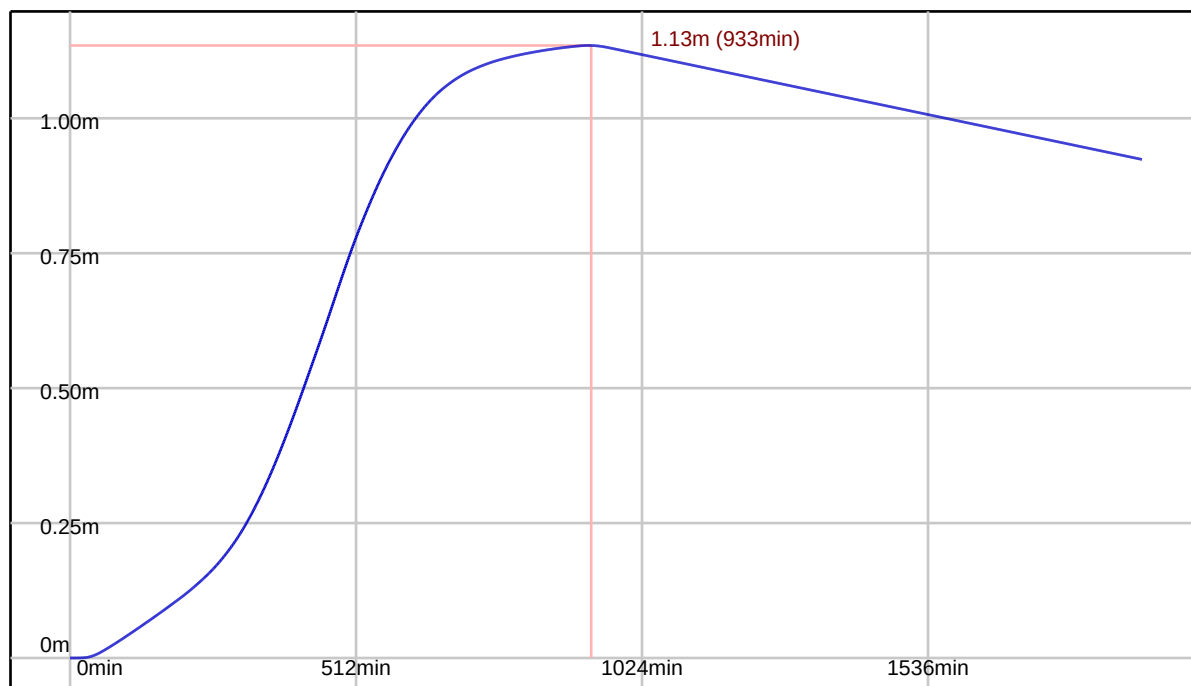
Pond Structure at Manhole S1-HW2

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
39.430	1.400	988.790	40.530	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S1-HW2



Pond at S1-HW2 (100Yr+40% 960Min Winter)

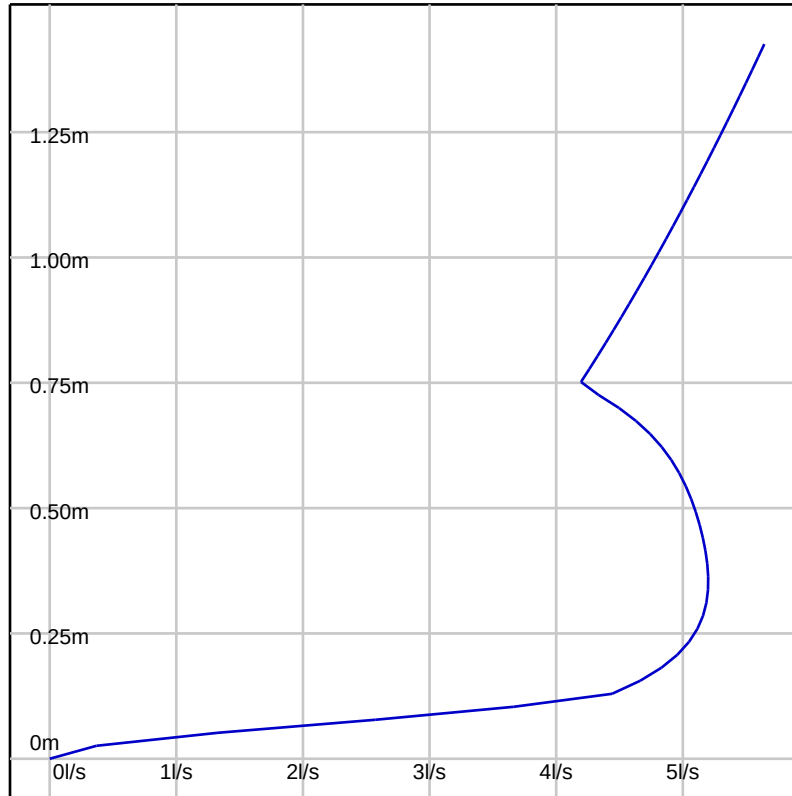


Controls within Manhole S1-14

Hydro-Brake® Optimum Control at Manhole S1-14

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0105-5200-1200-5200 ID:614736	1.200	5.200	0.000	0.354	5.201	0.746	4.181

Hydro-Brake® Optimum Control at S1-14



Simulation Settings

FEH2013 (point): Filename=FEH_Point_Descriptors_386055_156308.xml

Summer (Cv: 0.75), Winter (Cv: 0.84)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Periods (yrs) + Climate Change: (5, +0%), (100, +0%), (100, +40%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
5Yr 15Min Winter	47.029	0.00	-0.22	100Yr 720Min Winter	6.994	0.00	0.08
5Yr 15Min Summer	47.029	0.00	-0.26	100Yr 960Min Summer	5.571	0.00	0.01
5Yr 30Min Winter	30.675	0.00	-0.12	100Yr 960Min Winter	5.571	0.00	0.04
5Yr 30Min Summer	30.675	0.00	-0.15	100Yr 1440Min Summer	3.985	0.00	-0.01
5Yr 60Min Winter	19.136	0.00	-0.04	100Yr 1440Min Winter	3.985	0.00	0.00
5Yr 60Min Summer	19.136	0.00	-0.05	100Yr 2160Min Summer	2.814	0.00	-0.01
5Yr 120Min Winter	12.421	0.00	-0.03	100Yr 2160Min Winter	2.814	0.00	-0.01
5Yr 120Min Summer	12.421	0.00	-0.03	100Yr 2880Min Summer	2.178	0.00	-0.00
5Yr 180Min Summer	9.561	0.00	-0.03	100Yr 2880Min Winter	2.178	0.00	-0.00
5Yr 180Min Winter	9.561	0.00	-0.02	100Yr 4320Min Summer	1.517	0.00	0.00
5Yr 240Min Summer	7.802	0.00	-0.02	100Yr 4320Min Winter	1.517	0.00	0.00
5Yr 240Min Winter	7.802	0.00	-0.02	100Yr 5760Min Summer	1.178	0.00	0.00
5Yr 360Min Summer	5.847	0.00	-0.02	100Yr 5760Min Winter	1.178	0.00	0.00
5Yr 360Min Winter	5.847	0.00	-0.02	100Yr 7200Min Summer	0.976	0.00	0.00
5Yr 480Min Summer	4.742	0.00	-0.02	100Yr 7200Min Winter	0.976	0.00	0.00
5Yr 480Min Winter	4.742	0.00	-0.02	100Yr 8640Min Summer	0.842	0.00	0.00
5Yr 600Min Summer	4.002	0.00	-0.02	100Yr 8640Min Winter	0.842	0.00	0.00
5Yr 600Min Winter	4.002	0.00	-0.02	100Yr 10080Min Summer	0.749	0.00	0.00
5Yr 720Min Summer	3.471	0.00	-0.02	100Yr 10080Min Winter	0.749	0.00	0.00
5Yr 720Min Winter	3.471	0.00	-0.02	100Yr+40% 15Min Summer	143.806	0.00	-0.14
5Yr 960Min Summer	2.771	0.00	-0.01	100Yr+40% 15Min Winter	143.806	0.00	-0.12
5Yr 960Min Winter	2.771	0.00	-0.01	100Yr+40% 30Min Summer	95.380	0.00	0.02
5Yr 1440Min Winter	2.006	0.00	0.00	100Yr+40% 30Min Winter	95.380	0.00	0.04
5Yr 1440Min Summer	2.006	0.00	-0.01	100Yr+40% 60Min Summer	60.339	0.00	0.09
5Yr 2160Min Winter	1.458	0.00	0.00	100Yr+40% 60Min Winter	60.339	0.00	0.15
5Yr 2160Min Summer	1.458	0.00	0.00	100Yr+40% 120Min Summer	36.510	0.00	0.14
5Yr 2880Min Summer	1.170	0.00	0.00	100Yr+40% 120Min Winter	36.510	0.00	0.19
5Yr 2880Min Winter	1.170	0.00	0.00	100Yr+40% 180Min Summer	27.150	0.00	0.17
5Yr 4320Min Summer	0.870	0.00	0.00	100Yr+40% 180Min Winter	27.150	0.00	0.23
5Yr 4320Min Winter	0.870	0.00	0.00	100Yr+40% 240Min Summer	22.108	0.00	0.20
5Yr 5760Min Summer	0.713	0.00	0.00	100Yr+40% 240Min Winter	22.108	0.00	0.31
5Yr 5760Min Winter	0.713	0.00	0.00	100Yr+40% 360Min Summer	16.467	0.00	0.21
5Yr 7200Min Summer	0.617	0.00	0.00	100Yr+40% 360Min Winter	16.467	0.00	0.42
5Yr 7200Min Winter	0.617	0.00	0.00	100Yr+40% 480Min Summer	13.320	0.00	0.21
5Yr 8640Min Summer	0.553	0.00	0.00	100Yr+40% 480Min Winter	13.320	0.00	0.44
5Yr 8640Min Winter	0.553	0.00	0.00	100Yr+40% 600Min Summer	11.265	0.00	0.19
5Yr 10080Min Winter	0.506	0.00	0.00	100Yr+40% 600Min Winter	11.265	0.00	0.42
5Yr 10080Min Summer	0.506	0.00	0.00	100Yr+40% 720Min Summer	9.791	0.00	0.17
100Yr 15Min Summer	102.719	0.00	-0.10	100Yr+40% 720Min Winter	9.791	0.00	0.38
100Yr 15Min Winter	102.719	0.00	-0.08	100Yr+40% 960Min Summer	7.799	0.00	0.13
100Yr 30Min Summer	68.128	0.00	-0.06	100Yr+40% 960Min Winter	7.799	0.00	0.25
100Yr 30Min Winter	68.128	0.00	0.00	100Yr+40% 1440Min Summer	5.580	0.00	0.06
100Yr 60Min Summer	43.099	0.00	0.00	100Yr+40% 1440Min Winter	5.580	0.00	0.10
100Yr 60Min Winter	43.099	0.00	0.05	100Yr+40% 2160Min Summer	3.940	0.00	-0.00
100Yr 120Min Summer	26.078	0.00	0.05	100Yr+40% 2160Min Winter	3.940	0.00	0.01
100Yr 120Min Winter	26.078	0.00	0.07	100Yr+40% 2880Min Summer	3.050	0.00	-0.01
100Yr 180Min Summer	19.393	0.00	0.06	100Yr+40% 2880Min Winter	3.050	0.00	-0.01
100Yr 180Min Winter	19.393	0.00	0.10	100Yr+40% 4320Min Summer	2.124	0.00	-0.00
100Yr 240Min Summer	15.792	0.00	0.06	100Yr+40% 4320Min Winter	2.124	0.00	-0.00
100Yr 240Min Winter	15.792	0.00	0.11	100Yr+40% 5760Min Summer	1.649	0.00	0.00
100Yr 360Min Summer	11.762	0.00	0.06	100Yr+40% 5760Min Winter	1.649	0.00	0.00
100Yr 360Min Winter	11.762	0.00	0.11	100Yr+40% 7200Min Summer	1.366	0.00	0.00
100Yr 480Min Summer	9.515	0.00	0.05	100Yr+40% 7200Min Winter	1.366	0.00	0.00
100Yr 480Min Winter	9.515	0.00	0.11	100Yr+40% 8640Min Summer	1.179	0.00	0.00
100Yr 600Min Summer	8.047	0.00	0.04	100Yr+40% 8640Min Winter	1.179	0.00	0.00

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
100Yr 600Min Winter	8.047	0.00	0.10	100Yr+40% 10080Min Winter	1.048	0.00	0.00
100Yr 720Min Summer	6.994	0.00	0.03	100Yr+40% 10080Min Summer	1.048	0.00	0.00

Simulation Results

Return Period Yrs: 5.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S278-02	15 min Winter	9	41.127	0.077	8.751		OK
S278-01	15 min Winter	9	41.592	0.092	12.253		OK
S1-02	15 min Winter	9	40.944	0.184	35.987		OK
S1-03	15 min Winter	10	40.845	0.229	34.979		Surcharged
S1-04	15 min Winter	10	40.773	0.230	39.402		Surcharged
S22-3	-	0	41.950	0.000	0.000		OK
S1-1	-	0	41.000	0.000	0.000		OK
S1-05	15 min Winter	9	40.467	0.240	85.198		OK
S6-2	-	0	40.610	0.000	0.000		OK
S1-06	15 min Winter	8	40.551	0.143	31.483		OK
S14-4	-	0	40.440	0.000	0.000		OK
S1-07	15 min Winter	9	40.431	0.343	144.340		OK
S49-1	-	0	41.150	0.000	0.000		OK
S1-08	15 min Winter	8	40.892	0.110	45.314		OK
S1-09	15 min Winter	9	40.361	0.357	207.251		OK
S16-3	-	0	40.280	0.000	0.000		OK
S1-10	15 min Winter	9	40.131	0.321	207.722		OK
S42-2	-	0	40.300	0.000	0.000		OK
S15-3	-	0	40.250	0.000	0.000		OK
S1-11	15 min Winter	10	40.053	0.303	207.680		OK
S1-HW1	600 min Winter	505	39.853	0.423	4.483		OK
S1-12	15 min Winter	8	40.055	0.150	33.497		OK
S44-1	-	0	40.200	0.000	0.000		OK
S1-13	15 min Winter	9	39.918	0.162	38.235		OK
S1-HW2	600 min Winter	505	39.853	0.423	0.718		OK
S1-HW3	600 min Winter	505	39.853	0.423	5.198		OK
S1-14	600 min Winter	505	39.853	0.448	5.197		Surcharged
S1-HW4	960 min Winter	701	39.416	0.066	5.200		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	9	S278-02	S1-02	0.130	0.389	8.916	0.258	OK
2.000	15 min Winter	9	S278-01	S1-02	0.092	0.819	12.507	0.361	OK
1.001	15 min Winter	10	S1-02	S1-03	0.203	0.985	35.030	1.015	OK
1.002	15 min Winter	10	S1-03	S1-04	0.225	0.914	34.751	1.009	OK
1.003	15 min Winter	10	S1-04	S1-05	0.195	1.070	39.230	1.292	OK
3.000	15 min Winter	0	S22-3	S1-05	0.000	0.000	0.000	0.000	OK
4.000	15 min Winter	0	S1-1	S1-05	0.000	0.000	0.000	0.000	OK
1.004	15 min Winter	9	S1-05	S1-07	0.292	0.769	82.419	0.519	OK
5.000	15 min Winter	0	S6-2	S1-06	0.000	0.000	0.000	0.000	OK
5.001	15 min Winter	9	S1-06	S1-07	0.167	0.869	30.817	0.474	OK
6.000	15 min Winter	9	S14-4	S1-07	0.022	0.000	0.000	0.000	OK
1.005	15 min Winter	10	S1-07	S1-09	0.350	1.078	141.263	0.931	OK
7.000	15 min Winter	0	S49-1	S1-08	0.000	0.000	0.000	0.000	OK
7.001	15 min Winter	9	S1-08	S1-09	0.157	1.686	44.910	0.293	OK
1.006	15 min Winter	9	S1-09	S1-10	0.338	1.606	204.904	1.270	OK
8.000	15 min Winter	0	S16-3	S1-10	0.000	0.000	0.000	0.000	OK
1.007	15 min Winter	10	S1-10	S1-11	0.311	1.403	207.680	0.645	OK
9.000	15 min Winter	0	S42-2	S1-11	0.000	0.000	0.000	0.000	OK
10.000	15 min Winter	0	S15-3	S1-11	0.000	0.000	0.000	0.000	OK
1.008	15 min Winter	10	S1-11	S1-HW1	0.299	1.484	209.239	0.629	OK
1.009	600 min Winter	505	S1-HW1	S1-HW3	0.423	0.277	25.452		OK
11.000	15 min Winter	8	S1-12	S1-13	0.155	0.889	32.841	0.515	OK
12.000	15 min Winter	9	S44-1	S1-13	0.006	0.000	0.000	0.000	OK
11.001	15 min Winter	9	S1-13	S1-HW2	0.157	1.041	38.948	0.671	OK

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
11.002	480 min Winter	609	S1-HW2	S1-HW3	0.300	0.075	4.797		Surcharged
1.010	15 min Summer	9	S1-HW3	S1-14	0.300	0.626	16.842	0.233	Surcharged
1.011	960 min Winter	701	S1-14	S1-HW4	0.070	0.649	5.200	0.498	OK

Return Period Yrs: 100.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S278-02	15 min Winter	11	41.676	0.626	11.687		Surcharged
S278-01	15 min Winter	11	41.669	0.169	16.365		OK
S1-02	15 min Winter	11	41.635	0.875	46.061		Surcharged
S1-03	15 min Winter	11	41.389	0.773	48.854		Surcharged
S1-04	15 min Winter	10	41.243	0.700	55.932		Surcharged
S22-3	-	0	41.950	0.000	0.000		OK
S1-1	-	0	41.000	0.000	0.000		OK
S1-05	15 min Winter	9	40.968	0.741	148.104		Surcharged
S6-2	15 min Winter	9	41.000	0.390	0.360		Surcharged
S1-06	15 min Winter	9	41.001	0.593	64.631		Surcharged
S14-4	15 min Winter	10	40.864	0.424	0.000		Surcharged
S1-07	15 min Winter	10	40.863	0.775	261.343		Surcharged
S49-1	-	0	41.150	0.000	0.000		OK
S1-08	15 min Winter	8	40.966	0.184	98.998		OK
S1-09	15 min Winter	9	40.631	0.627	407.437		Surcharged
S16-3	15 min Winter	11	40.351	0.071	0.624		OK
S1-10	15 min Winter	11	40.343	0.533	370.802		OK
S42-2	-	0	40.300	0.000	0.000		OK
S15-3	960 min Winter	921	40.280	0.030	0.000		OK
S1-11	960 min Winter	921	40.280	0.530	3.625		OK
S1-HW1	960 min Winter	921	40.280	0.850	3.750		OK
S1-12	960 min Winter	922	40.280	0.375	0.483		Surcharged
S44-1	960 min Winter	921	40.280	0.080	0.000		OK
S1-13	960 min Winter	921	40.280	0.524	0.591		Surcharged
S1-HW2	960 min Winter	921	40.280	0.850	0.591		OK
S1-HW3	960 min Winter	921	40.280	0.850	4.338		OK
S1-14	960 min Winter	921	40.280	0.875	4.338		Surcharged
S1-HW4	15 min Winter	7	39.416	0.066	5.203		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	16	S278-02	S1-02	0.225	0.476	16.584	0.481	OK
2.000	15 min Winter	11	S278-01	S1-02	0.197	1.007	27.341	0.789	OK
1.001	15 min Winter	13	S1-02	S1-03	0.225	1.264	50.271	1.457	OK
1.002	15 min Winter	13	S1-03	S1-04	0.225	1.446	57.499	1.670	OK
1.003	15 min Winter	13	S1-04	S1-05	0.225	1.715	67.272	2.216	OK
3.000	15 min Summer	0	S22-3	S1-05	0.000	0.000	0.000	0.000	OK
4.000	15 min Summer	8	S1-1	S1-05	0.075	0.000	0.000	0.000	OK
1.004	15 min Winter	10	S1-05	S1-07	0.450	0.905	143.862	0.907	OK
5.000	15 min Winter	12	S6-2	S1-06	0.150	0.231	3.274	0.220	Surcharged
5.001	15 min Winter	9	S1-06	S1-07	0.300	0.886	60.011	0.923	Surcharged
6.000	15 min Winter	12	S14-4	S1-07	0.150	0.246	2.540	0.174	Surcharged
1.005	15 min Winter	10	S1-07	S1-09	0.450	1.698	270.112	1.780	OK
7.000	15 min Winter	8	S49-1	S1-08	0.017	0.000	0.000	0.000	OK
7.001	15 min Winter	8	S1-08	S1-09	0.242	1.751	96.671	0.632	OK
1.006	15 min Winter	9	S1-09	S1-10	0.435	2.568	403.904	2.503	OK
8.000	15 min Winter	12	S16-3	S1-10	0.077	0.388	0.641	0.045	OK
1.007	15 min Winter	11	S1-10	S1-11	0.529	1.756	408.479	1.269	OK
9.000	960 min Winter	921	S42-2	S1-11	0.040	0.000	0.000	0.000	OK
10.000	960 min Winter	1002	S15-3	S1-11	0.055	0.002	0.004	0.000	OK
1.008	960 min Winter	921	S1-11	S1-HW1	0.540	0.851	34.664	0.104	OK
1.009	960 min Winter	921	S1-HW1	S1-HW3	0.850	0.228	34.786		OK
11.000	480 min Winter	364	S1-12	S1-13	0.300	0.576	8.552	0.134	Surcharged
12.000	960 min Winter	984	S44-1	S1-13	0.115	0.000	0.004	0.000	OK
11.001	180 min Summer	167	S1-13	S1-HW2	0.300	0.939	28.240	0.487	Surcharged
11.002	30 min Winter	47	S1-HW2	S1-HW3	0.300	0.095	6.734		Surcharged
1.010	15 min Winter	6	S1-HW3	S1-14	0.300	0.705	17.756	0.245	Surcharged
1.011	15 min Winter	7	S1-14	S1-HW4	0.070	0.649	5.203	0.498	OK

Return Period Yrs: 100.0

Climate Change %: 40

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S278-02	15 min Winter	12	42.286	1.236	11.375		Surcharged
S278-01	15 min Winter	12	42.301	0.801	15.927		Surcharged
S1-02	15 min Winter	12	42.248	1.488	48.690		Surcharged
S1-03	15 min Winter	11	41.947	1.331	52.833		Surcharged
S1-04	15 min Winter	11	41.795	1.253	60.811		Surcharged
S22-3	-	0	41.950	0.000	0.000		OK
S1-1	15 min Winter	10	41.482	0.482	0.571		Surcharged
S1-05	15 min Winter	10	41.482	1.255	171.102		Surcharged
S6-2	15 min Winter	10	41.506	0.896	1.320		Surcharged
S1-06	15 min Winter	10	41.499	1.091	75.446	0.436	Flood
S14-4	15 min Winter	10	41.339	0.899	0.105		Surcharged
S1-07	15 min Winter	10	41.342	1.254	313.763		Surcharged
S49-1	15 min Winter	10	41.342	0.192	0.000		Surcharged
S1-08	15 min Winter	10	41.340	0.558	109.533		Surcharged
S1-09	15 min Winter	10	41.028	1.024	482.419		Surcharged
S16-3	15 min Winter	11	40.677	0.397	0.000		Surcharged
S1-10	15 min Winter	10	40.675	0.865	486.897		Surcharged
S42-2	15 min Winter	11	40.572	0.272	0.576		Surcharged
S15-3	960 min Winter	928	40.565	0.315	0.000		Surcharged
S1-11	960 min Winter	928	40.565	0.815	4.207		Surcharged
S1-HW1	960 min Winter	930	40.565	1.135	4.066		Flood Risk
S1-12	960 min Winter	926	40.565	0.660	0.606		Surcharged
S44-1	960 min Winter	928	40.565	0.365	0.008		Surcharged
S1-13	960 min Winter	929	40.565	0.809	0.665		Surcharged
S1-HW2	960 min Winter	928	40.565	1.135	0.671		Flood Risk
S1-HW3	960 min Winter	929	40.565	1.135	4.992		Flood Risk
S1-14	960 min Winter	929	40.565	1.160	4.979		Flood Risk
S1-HW4	30 min Winter	12	39.416	0.066	5.201		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Winter	20	S278-02	S1-02	0.225	0.544	17.509	0.507	OK
2.000	15 min Winter	8	S278-01	S1-02	0.225	1.029	32.056	0.925	OK
1.001	15 min Winter	15	S1-02	S1-03	0.225	1.433	56.976	1.652	OK
1.002	15 min Winter	15	S1-03	S1-04	0.225	1.732	68.866	2.000	OK
1.003	15 min Winter	15	S1-04	S1-05	0.225	2.061	81.961	2.700	OK
3.000	15 min Summer	0	S22-3	S1-05	0.000	0.000	0.000	0.000	OK
4.000	15 min Winter	13	S1-1	S1-05	0.150	0.261	4.162	0.088	Surcharged
1.004	15 min Winter	10	S1-05	S1-07	0.450	1.045	166.198	1.047	OK
5.000	15 min Winter	13	S6-2	S1-06	0.150	0.273	4.830	0.325	Surcharged
5.001	15 min Winter	9	S1-06	S1-07	0.300	1.082	76.480	1.177	Surcharged
6.000	15 min Winter	14	S14-4	S1-07	0.150	0.247	4.211	0.289	Surcharged
1.005	15 min Winter	11	S1-07	S1-09	0.450	1.940	308.511	2.034	OK
7.000	15 min Winter	11	S49-1	S1-08	0.150	0.274	3.575	0.117	Surcharged
7.001	15 min Winter	8	S1-08	S1-09	0.300	1.817	122.779	0.802	Surcharged
1.006	15 min Winter	8	S1-09	S1-10	0.450	3.030	481.926	2.987	OK
8.000	15 min Winter	15	S16-3	S1-10	0.150	0.396	2.473	0.175	Surcharged
1.007	15 min Winter	10	S1-10	S1-11	0.600	1.752	481.477	1.496	Surcharged
9.000	15 min Winter	14	S42-2	S1-11	0.150	0.228	2.253	0.104	Surcharged
10.000	15 min Winter	9	S15-3	S1-11	0.150	0.298	2.907	0.126	Surcharged
1.008	15 min Winter	10	S1-11	S1-HW1	0.600	1.875	483.607	1.454	Surcharged
1.009	15 min Winter	10	S1-HW1	S1-HW3	0.900	0.927	491.360		OK
11.000	15 min Winter	9	S1-12	S1-13	0.300	1.398	98.834	1.550	Surcharged
12.000	2160 min Summer	2716	S44-1	S1-13	0.150	0.005	0.049	0.002	Surcharged
11.001	60 min Summer	47	S1-13	S1-HW2	0.300	1.339	78.331	1.350	Surcharged
11.002	30 min Summer	47	S1-HW2	S1-HW3	0.300	0.132	9.352		Surcharged
1.010	15 min Winter	6	S1-HW3	S1-14	0.300	0.852	19.870	0.275	Surcharged
1.011	30 min Winter	12	S1-14	S1-HW4	0.070	0.649	5.201	0.498	OK