

Document Control			
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Date	13.01.26	Signature	
Checked by	TKe	Approved by	TKe
Signature		Signature	

Date: 13 January 2026

Subject:
Battle Street - Response to
Planning Condition 30

Aim

The following information has been prepared to discharge Planning Condition 30 of Planning Application 08/03/2506 for the Land at Battle Street, Reading. The SuDS design and associated maintenance requirements follow the principles of the approved scheme which was granted permission 7th September 2023.

Planning Condition 30: SuDS Details

“No development shall commence on site until a Sustainable Drainage Strategy and associated detailed design, management and maintenance plan of surface water drainage for the site using SuDS methods has been submitted to and approved in writing by the Local Planning Authority. The plan shall include:

- i. a timetable for its implementation, and*
- ii. a management and annual maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.”*

REASON: These details are required due to insufficient information being contained within this submission and in order to reduce the risk of flooding onsite or elsewhere in accordance with Policy EN18 of the Reading Borough Local Plan 2019.

Part i

The contractor has provided the following information which includes the timeline for the construction of the SUDS elements across the site.

Green Roof Installation Timeline			
Block A	Block C	Block E	Block F
Dec 2026 – Aug 2027	Nov 2026 – Dec 2026	Jan 2027 – Feb 2027	Feb 2027 – Mar 2027

Below Ground SuDS Installation Timeline
Sep 2026 – Nov 2026

Part ii

“A management and annual maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.”

Response

During the construction phase of the development, the responsibility for the maintenance of SuDS lies with the contractor. Post-construction, all proposed drainage within the site is to be private (i.e. does not lie on public land) therefore all SuDS will be maintained by the site owner for the lifetime of the development.

The below ground drainage system should be regularly inspected and maintained to ensure that it is kept clear of silt and debris. Permanent inspection records should be kept by the site owner or management company, recording any previous issues and future work to be carried out.

There are three categories of maintenance activities, as follows:

- 1. Regular maintenance (including inspections and monitoring)
- 2. Occasional maintenance
- 3. Remedial maintenance

The sections below summarise the proposed schedule of maintenance for each SuDS element in accordance with the SuDS Manual.

Pervious paving

Maintenance requirements for pervious paving are listed in **Table 1**.

Table 1: Pervious paving maintenance schedule

Maintenance schedule	Required action	Frequency
Regular maintenance	Brushing and vacuuming.	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required.
	Removal of weeds.	As required.

Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure.	As required (if infiltration performance is reduced as a result of significant clogging).
Monitoring	Initial inspection.	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	3-monthly, 48 h after large storms.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor inspection chambers.	Annually.

Geocellular / Modular systems

Maintenance requirements for geocellular /modular systems are listed in **Table 2**.

Table 2: *Geocellular / modular systems maintenance schedule*

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlets, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually and after large storms

Drainage pipes, silt traps and catchpits

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface and chambers (where may cause risks to performance)	Monthly
	Inspection of manholes, silt traps and catchpits to assess silt accumulation	Monthly (and after large storms)
	Removal of accumulated silt from silt trap and catchpit sumps	Annually, or as required
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents	As required

	Cleaning/jetting of pipework if silt/debris is building up in system	As required
Monitoring	Inspect/check all inlets, outlets, and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms

NOTE: Manhole covers can be heavy and suitable lifting equipment/ procedures should be used. Where possible, personnel should not enter manholes to carry out maintenance.

Green roofs

Maintenance requirements for green roofs are listed in **Table** .

Table 3: Green roof maintenance schedule

Maintenance schedule	Required action	Frequency
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth.	Six monthly/ Annually or as required
	During establishment (i.e. one year), replace dead plants as required.	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required.	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage.	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds.	Six monthly or as required
	Mow grasses (if appropriate) as required. Clippings must be removed and not allowed to accumulate.	Six monthly or as required
Occasional maintenance	-	-
Remedial actions	If erosion channels are evident, these should be stabilised with additional soil substrate similar to the original material. Sources of erosion damage must be identified and controlled.	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required
Monitoring	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes, and roof structure for proper operation, integrity if waterproofing and structural stability.	Annually/after severe storms
	Inspect soils substrate for evidence of erosion channels and identify any sediment sources.	Annually/after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system.	Annually/after severe storms
	Inspect underside of roof for evidence of leakage.	Annually/after severe storms

Gullies and linear drains

Inspection and removal of debris from silt trap every 3 months, preferably after leaf fall in the autumn. (Timeframe can be adjusted to suit actual site conditions.) Charge water trap where necessary.

Pumping stations

Pumping stations are to be maintained in accordance with the pump supplier/maintenance company requirements and in accordance with British Standards (BS EN 12056-4), i.e. inspections every quarter.

Unusual / unresolved problems

If the drainage system is still holding water following cleaning with a jetter, or the jetting of the system removes excessive amounts of debris this may indicate greater issues within the system. A CCTV survey is likely to be required, and further advice should be sought from a drainage engineer.

The following are specific indicators which may trigger intervention:

- Witnessing waterlogged areas / standing or stagnant water / poorly drained areas, indicative of a blockage
- Removal of fallen leaves and debris particularly in autumn months
- Significant storm events are typically classed as MET Office weather alert Amber and above.

Additional Information

The following information has been provided to supplement the response for discharging Condition 30:

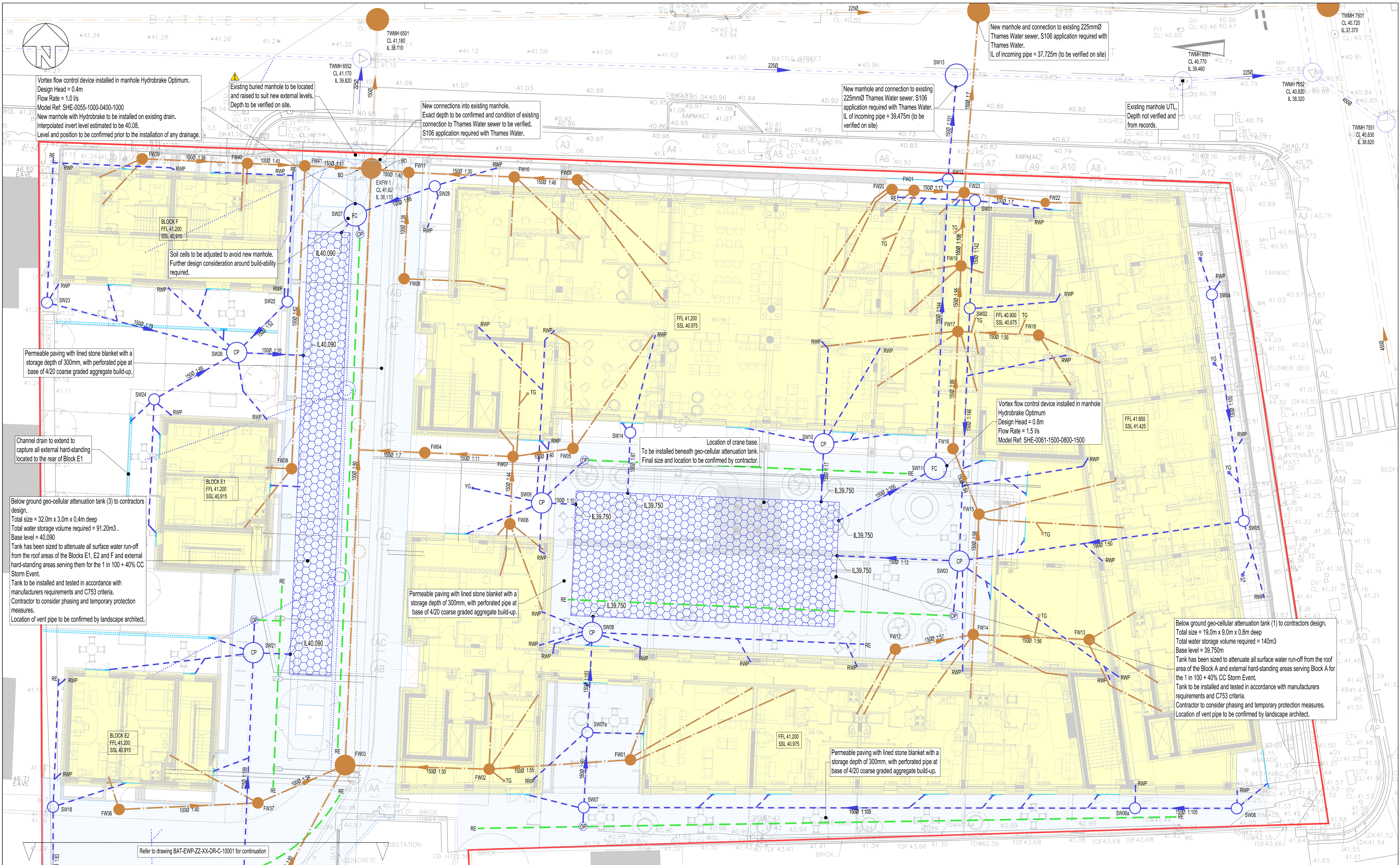
- Drawing BAT-EWP-ZZ-00-DR-C-10000 – Proposed Below Ground Drainage (Sheet 1 of 2)
- Drawing BAT-EWP-ZZ-00-DR-C-10001 – Proposed Below Ground Drainage (Sheet 2 of 2)
- Drawing BAT-EWP-ZZ-00-DR-C-11000 – Proposed Below Ground Drainage Manhole Schedules
- Hydraulic Calculations – Block A
- Hydraulic Calculations – Block B-F

The above is located within **Appendix A**.

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Appendix A

Drawing BAT-EWP-ZZ-00-DR-C-10000 - Proposed Below Ground Drainage (Sheet 1 of 2)



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

All drawings to be printed in colour.

LEGEND

- Foul water manhole
- Surface water manhole
- Existing foul water
- Existing surface water
- Proposed foul water
- Proposed surface water
- ... Foul water pipe to be abandoned
- ... Surface water pipe to be abandoned
- Proposed linear channel with heelguard grating with sump unit
- Proposed threshold drain with brick slot upstand with sump unit
- FD Trapped floor drain
- YG Yard Gully
- Foul drop point
- SVP Soil vent pipe
- RWP Rain water pipe
- Geo-cellular surface water attenuation (to contractor design)
- FC Flow control chamber
- OC Office chamber
- Proposed permeable paving
- Existing building
- Proposed building
- Site boundary

Refer to drawing BAT-EWP-ZZ-XX-DR-C-110000 for the below ground drainage general notes.

External services shown in grey. Refer to Bennett Freshill external services drawing for further details.

NOT FOR CONSTRUCTION

PO4	21.10.25	JRo	Tke	Issued for Stage 3
PO3	31.10.25	Tke	JRo	Preliminary
PO2	03.10.25	JRo	Tke	Preliminary
POT	29.08.25	JRo	JDI	Preliminary
Rev	Date	By	Chk	Description

Drawing title

Proposed Below Ground Drainage General Arrangement Block A

Scale

1:25 @ A1

EWP Project

2240067

Date

August 25

Drawn

JRo

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Project

Battle Street Reading RG1 7NU

Design Phase

Preliminary

Status

P04

Revision

P04

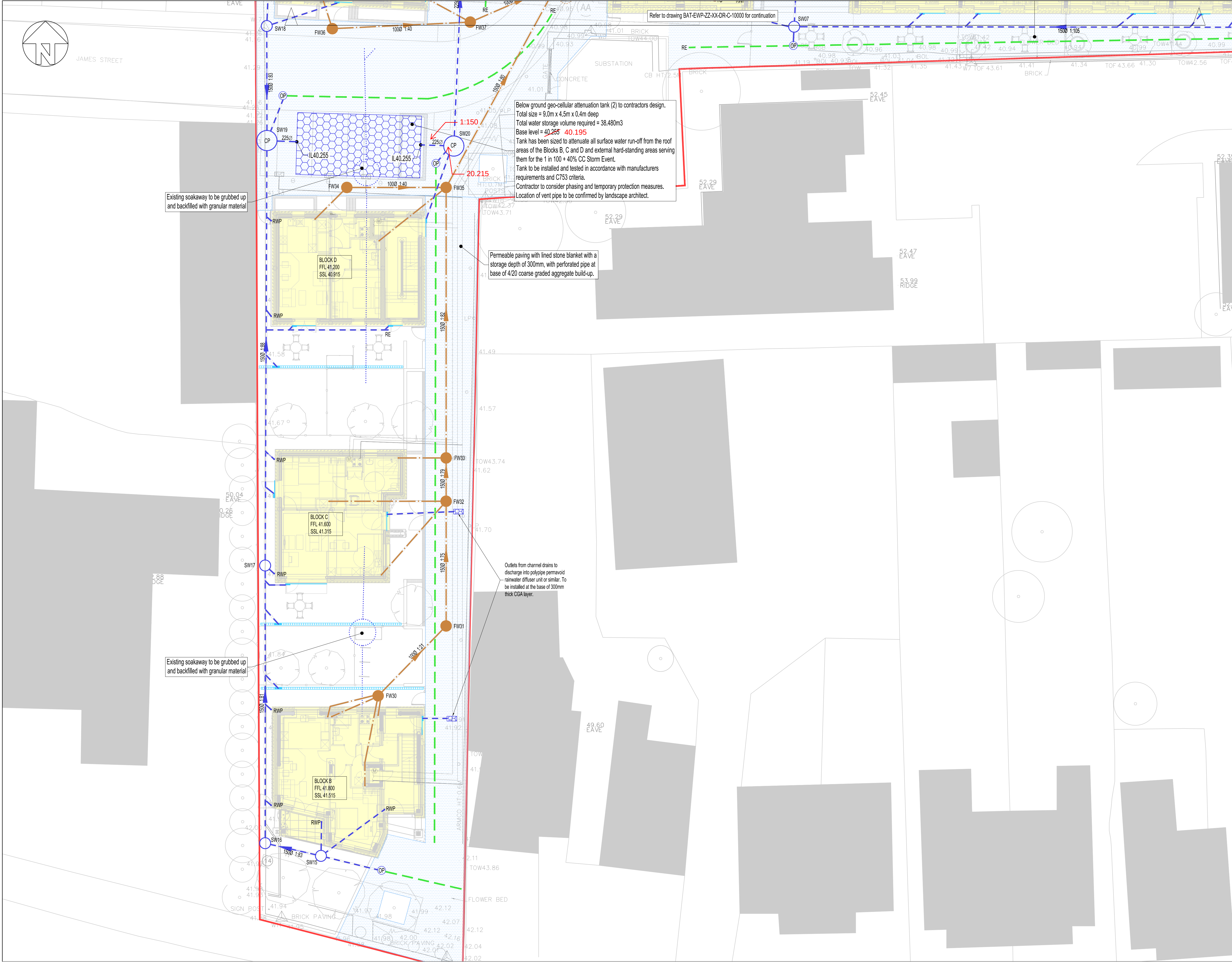
[Project]-[Origin]-[Function]-[Spatial]-[Form]-[Discipline]-[No.]

BAT - EWP - ZZ - 00 - DR - C - 10000

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Drawing BAT-EWP-ZZ-00-DR-C-10001 - Proposed Below Ground Drainage (Sheet 2 of 2)





This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

All drawings to be printed in colour.

LEGEND

- Foul water manhole
- Surface water manhole
- Existing foul water
- Existing surface water
- Proposed foul water
- Proposed surface water
- Foul water pipe to be abandoned
- Surface water pipe to be abandoned
- Proposed linear channel with heelguard grating and sump unit
- Proposed threshold drain with brick slot upstand and sump unit
- RG Trapped road gully
- YG Trapped yard gully
- FD Trapped floor drain
- Foul drop point
- SVP Soil vent pipe
- RWP Rain water pipe
- Geocellular surface water attenuation (to contractor design)
- FC Flow control chamber
- Perforated pipe
- Office plate
- Proposed permeable paving
- Existing building
- Proposed building
- Site boundary

Refer to drawing BAT-EWP-ZZ-XX-DR-C-10000 for the below ground drainage general notes.

External services shown in grey. Refer to Bennett Freehill external services drawing for further details.

NOT FOR CONSTRUCTION

P02	21.11.25	JRo	TKe	Issued for Stage 3
P01	31.10.25	TKe	JRo	Issued for information
Rev	Date	By	Chk	Description

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Project

Battle Street

Reading,

RG1 7NU

Drawing Title

Proposed Below Ground Drainage

General Arrangement

Sheet 2

Scale	EWP Project	Date	Drawn
1:25 @ A1	2240067	July 2025	TKe
Design Phase	Status	Revision	
For Information		P02	

[Project]-[Origin]-[Function]-[Spatial]-[Form]-[Discipline]-[No.]

2240067-EWP-ZZ-00-DR-C-10001

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Drawing BAT-EWP-ZZ-00-DR-C-11000 – Proposed Below Ground Drainage Manhole Schedules



SW MANHOLE SCHEDULE									
Manhole	Chamber Type	Cover Level (m)	Depth	Chamber Size	Eastings	Northings	Clear Opening	Cover Grade	Comments
SW01	PPIC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.600 INV OUT = 40.600	0.600	4500	470682.940	173526.968	450x450	B125	Recessed cover
SW02	PPIC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.545 INV IN = 40.545 INV OUT = 40.545	0.655	4500	470682.564	173519.184	450x450	B125	Recessed cover
SW03	PCC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.020 INV IN = 40.420 INV IN = 40.420 INV OUT = 40.420	1.180	10500	470681.802	173500.957	600x600	B125	Catchpit manhole with 400mm deep sump and recessed cover
SW04	PPIC	CL = 41.650 SUMP LEVEL OF MANHOLE = 41.000 INV OUT = 41.000	0.650	4500	470700.025	173520.180	450x450	B125	Recessed cover
SW05	PPIC	CL = 41.650 SUMP LEVEL OF MANHOLE = 40.835 INV IN = 40.835 INV OUT = 40.835	0.815	4500	470702.320	173503.839	450x450	B125	Recessed cover
SW06	PPIC	CL = 41.600 SUMP LEVEL OF MANHOLE = 41.000 INV OUT = 41.000	0.600	4500	470701.812	173483.120	450x450	B125	Recessed cover
SW06a	PPIC	CL = 41.600 SUMP LEVEL OF MANHOLE = 40.930 INV IN = 40.930 INV OUT = 40.930	0.670	4500	470694.482	173483.129	450x450	B125	Recessed cover
SW07	PPIC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.550 INV IN = 40.550 INV OUT = 40.550	0.650	4500	470654.744	173483.180	450x450	B125	Recessed cover
SW07a	PPIC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.490 INV IN = 40.490 INV OUT = 40.490	0.710	4500	470655.003	173488.591	450x450	B125	
SW08	PCC	CL = 41.200 SUMP LEVEL OF MANHOLE = 40.020 INV IN = 40.420 INV OUT = 40.420	1.180	10500	470655.348	173495.810	600x600	B125	Catchpit manhole with 400mm deep sump
SW09	PCC	CL = 41.200 SUMP LEVEL OF MANHOLE = 39.600 INV OUT = 40.000	1.600	10500	470651.706	173505.151	600x600	B125	Type B Catchpit manhole with 400mm deep sump
SW10	PCC	CL = 41.200 SUMP LEVEL OF MANHOLE = 39.600 INV OUT = 40.000	1.600	10500	470672.041	173509.416	600x600	B125	Type B Catchpit manhole with 400mm deep sump
SW11	PCC	CL = 41.200 SUMP LEVEL OF MANHOLE = 39.270 INV IN = 39.570 INV OUT = 39.670	1.930	12000	470680.079	173507.640	600x600	B125	Type B Hydrobrake to be installed in manhole with 400mm deep sump
SW12	PPIC	CL = 41.200 SUMP LEVEL OF MANHOLE = 39.525 INV IN = 39.525 INV OUT = 39.525	1.675	4500	470680.988	173528.477	450x450	B125	Reduced access piece required
SW13	PCC	CL = 40.700 SUMP LEVEL OF MANHOLE = 39.475 INV IN = 39.475	1.225	12000	470681.615	173535.995	600x600	D400	New Adoptable manhole to be installed on existing Thames Water sewer. Exact invert level to be confirmed.
SW14	PPIC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.200 INV IN = 40.200 INV OUT = 40.200	0.900	4500	470658.091	173510.221	450x450	D400	Recessed cover

SW MANHOLE SCHEDULE									
Manhole	Chamber Type	Cover Level (m)	Depth	Chamber Size	Eastings	Northings	Clear Opening	Cover Grade	Comments
SW15	PPIC	CL = 41.700 SUMP LEVEL OF MANHOLE = 40.950 INV OUT = 40.950	0.750	4500	470620.414	173422.989	450x450	B125	
SW16	PPIC	CL = 41.700 SUMP LEVEL OF MANHOLE = 40.900 INV IN = 40.900 INV OUT = 40.900	0.800	4500	470616.362	173423.913	450x450	B125	
SW17	PPIC	CL = 41.500 SUMP LEVEL OF MANHOLE = 40.650 INV IN = 40.650 INV OUT = 40.650	0.850	4500	470616.362	173444.069	450x450	B125	
SW18	PPIC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.400 INV OUT = 40.400	0.700	4500	470616.480	173483.227	450x450	D400	Recessed cover
SW19	PCC	CL = 41.100 SUMP LEVEL OF MANHOLE = 39.900 INV IN = 40.300 INV IN = 40.300 INV OUT = 40.300	1.200	10500	470616.491	173474.911	600x600	D400	Recessed cover
SW20	PCC	CL = 41.100 SUMP LEVEL OF MANHOLE = 39.800 INV IN = 40.200 INV OUT = 40.200	1.300	10500	470630.051	173474.517	600x600	D400	Recessed cover
SW21	PCC	CL = 41.100 SUMP LEVEL OF MANHOLE = 39.700 INV IN = 40.100 INV OUT = 40.100	1.400	10500	470630.918	173494.350	600x600	D400	Recessed cover
SW23	PPIC	CL = 41.150 SUMP LEVEL OF MANHOLE = 40.580 INV OUT = 40.580	0.570	4500	470616.045	173519.598	450x450	B125	Recessed cover
SW24	PPIC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.500 INV OUT = 40.500	0.600	4500	470623.769	173512.614	450x450	B125	Recessed cover
SW25	PPIC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.500 INV OUT = 40.500	0.600	4500	470633.380	173519.664	450x450	D400	Recessed cover

FW MANHOLE SCHEDULE									
Manhole	Chamber Type	Cover Level (m)	Depth	Chamber Size	Eastings	Northings	Clear Opening	Cover Grade	Comments
FW01	PPIC	CL = 41.200 INV OUT = 40.165	1.015	4500	470658.105	173486.623	450x450	B125	Recessed cover
FW02	PPIC	CL = 41.200 INV IN = 40.000 INV OUT = 40.000	1.200	4500	470647.915	173485.946	450x450	B125	Double sealed recessed cover
FW03	PCC	CL = 41.100 INV IN = 39.650 INV IN = 39.650 INV IN = 39.700 INV OUT = 39.650	1.450	10500	470637.532	173486.235	600x600	D400	Recessed cover
FW04	PPIC	CL = 40.609 INV IN = 39.565 INV OUT = 40.045	1.044	4500	470643.282	173508.773	450x450	D400	Recessed cover with reduced access piece required.
FW05	PPIC	CL = 41.200 INV OUT = 40.250	0.950	4500	470653.963	173509.081	450x450	B125	Recessed cover
FW06	PPIC	CL = 41.200 INV OUT = 40.300	0.900	4500	470649.418	173503.629	450x450	D400	Recessed cover
FW07	PPIC	CL = 41.200 INV IN = 40.190 INV IN = 40.140 INV OUT = 40.140	1.060	4500	470649.637	173508.493	450x450	D400	Recessed cover
FW08	PPIC	CL = 41.100 INV OUT = 40.100	1.000	4500	470641.786	173521.317	450x450	D400	Recessed cover with reduced access piece.
FW09	PPIC	CL = 41.200 INV OUT = 40.200	1.000	4500	470654.284	173528.455	450x450	B125	
FW10	PPIC	CL = 41.100 INV IN = 40.100 INV OUT = 40.100	1.000	4500	470649.729	173528.654	450x450	B125	Recessed cover
FW11	PPIC	CL = 41.100 INV IN = 39.900 INV IN = 39.850 INV OUT = 39.850	1.250	4500	470642.123	173528.983	450x450	D400	Recessed cover with reduced access piece.
FW12	PPIC	CL = 41.200 INV OUT = 40.300	0.900	4500	470677.206	173494.599	450x450	B125	Recessed cover
FW13	PPIC	CL = 41.200 INV OUT = 40.350	0.850	4500	470691.179	173495.292	450x450	B125	Recessed double sealed cover
FW14	PPIC	CL = 41.200 INV IN = 40.200 INV IN = 40.200 INV OUT = 40.150	1.050	4500	470682.816	173495.658	450x450	B125	
FW15	PPIC	CL = 41.200 INV IN = 40.000 INV OUT = 40.000	1.200	4500	470683.224	173504.336	450x450	B125	Recessed cover
FW16	PPIC	CL = 41.200 INV IN = 39.920 INV OUT = 39.920	1.280	4500	470681.356	173509.060	450x450	B125	Recessed cover with reduced access piece required.
FW17	PPIC	CL = 41.200 INV IN = 39.895 INV IN = 39.822 INV OUT = 39.820	1.380	4500	470681.710	173517.511	450x450	B125	Double sealed recessed cover with reduced access piece required.
FW18	PPIC	CL = 41.200 INV OUT = 40.000	1.200	4500	470687.533	173517.244	450x450	B125	Double sealed recessed cover.
FW19	PPIC	CL = 41.200 INV IN = 39.770 INV OUT = 39.770	1.430	4500	470681.937	173522.247	450x450	B125	Double sealed recessed cover with reduced acces piece required.
FW20	PPIC	CL = 41.200 INV OUT = 40.200	1.000	4500	470676.963	173527.749	450x450	B125	
FW21	PPIC	CL = 41.200 INV IN = 40.100 INV OUT = 40.100	1.100	4500	470678.544	173527.690	450x450	B125	
FW22	PPIC	CL = 41.200 INV IN = 40.600 INV OUT = 40.600	0.600	3000	470687.997	173526.816	300x300	B125	Recessed cover
FW23	PPIC	CL = 41.200 INV IN = 39.720 INV IN = 39.795 INV IN = 39.795 INV OUT = 39.720	1.480	4500	470682.164	173527.529	450x450	B125	Recessed cover with reduced access piece required.
FW25	PCC	CL = 38.505 INV IN = 37.725	0.780	12000	470683.200	173540.649	600x600	D400	New Adoptable Type A manhole to be installed on existing Thames Water sewer. Exact invert level to be confirmed.
FW30	PPIC	CL = 41.700 INV IN = 40.650 INV OUT = 40.600	1.100	4500	470624.559	173434.610	450x450	D400	Recessed cover
FW31	PPIC	CL = 41.600 INV IN = 40.260 INV OUT = 40.260	1.340	4500	470629.489	173439.682	450x450	D400	Recessed cover
FW32	PPIC	CL = 41.500 INV IN = 40.140 INV IN = 40.190 INV IN = 40.190 INV OUT = 40.140	1.360	4500	470629.489	173448.732	450x450	D400	Recessed cover
FW33	PPIC	CL = 41.500 INV IN = 40.100 INV IN = 40.150 INV OUT = 40.100	1.400	4500	470629.489	173451.877	450x450	D400	Recessed cover

SW MANHOLE SCHEDULE									
Manhole	Chamber Type	Cover Level (m)	Depth	Chamber Size	Eastings	Northings	Clear Opening	Cover Grade	Comments
SW26	PCC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.000 INV IN = 40.400 INV IN = 40.400 INV IN = 40.400 INV OUT = 40.400	1.100	10500	470629.723	173515.998	600x600	B125	
SW27	PCC	CL = 41.100 SUMP LEVEL OF MANHOLE = 39.680 INV IN = 40.080	1.420	12000	470638.267	173525.925	600x600	D400	Recessed cover. Hydrobrake to be installed in MH with 400mm deep sump.
SW28	PPIC	CL = 41.100 SUMP LEVEL OF MANHOLE = 40.300 INV OUT = 40.300	0.800	4500	470644.002	173527.990	450x450	D400	Recessed cover

FW MANHOLE SCHEDULE									
Manhole	Chamber Type	Cover Level (m)	Depth	Chamber Size	Eastings	Northings	Clear Opening	Cover Grade	Comments
FW34	PPIC	CL = 41.100 INV OUT = 40.090	1.010	4500	470622.289	173471.510	450x450	D400	Recessed cover
FW35	PPIC	CL = 41.100 INV IN = 39.860 INV IN = 39.910 INV IN = 39.910 INV OUT = 39.860	1.240	4500	470629.489	173471.510	450x450	D400	Recessed cover
FW36	PPIC	CL = 41.100 INV IN = 40.150 INV OUT = 40.150	0.950	4500	470621.238	173483.038	450x450	D400	Recessed cover
FW37	PPIC	CL = 41.100 INV IN = 39.950 INV IN = 39.900 INV OUT = 39.900	1.200	4500	470631.245	173483.512	450x450	D400	Recessed cover
FW38	PPIC	CL = 41.100 INV IN = 40.150 INV IN = 40.100 INV OUT = 40.100	1.000	4500	470633.678	173507.814	450x450	D400	Recessed cover
FW39	PPIC	CL = 41.100 INV OUT = 40.000	1.100	4500	470622.915	173529.971	450x450	B125	Recessed cover
FW40	PPIC	CL = 41.100 INV IN = 39.800 INV OUT = 39.800	1.300	4500	470630.490	173529.640	450x450	B125	Reduced access piece required
FW41	PPIC	CL = 41.100 INV IN = 39.700 INV OUT = 39.700	1.400	4500	470634.634	173529.458	450x450	D400	Recessed cover with reduced access piece

Below ground drainage notes

- The location and level of existing drainage connections and existing services is to be checked prior to commencement of drainage works. Any variance to the details on this drawing and the schedule is to be brought to the attention of the Engineer.
- The design is based on the information available on the date of issue from other parties (eg. Architect and M&E Engineer). It is subject to change resulting from updates to the available information from others.
- The drawings are to be read in conjunction with the NBS specifications, associated manhole schedule and standard drainage detail drawings where applicable.
- The positions of foul and surface water drainage points are indicative only, refer to the architects drawings for setting out details.
- Private foul and surface water drainage is to be constructed in accordance with Building Regulations Part H, BS EN 752 and BS EN 12056.
- All Foul Drains at ground level are to be constructed using vitrified clay pipes to BS EN 255-1 super strength specification (Hepworth Supersleve) or similar approved, as per Employers Requirements.
- Surface Water Drains sized at 100mm diameter are to be U-PVC Solid wall to BS EN 1401-1.
- Surface Water Drains at ground level greater than 100mm diameter are to be twin wall structured plastic to BS EN 13476-1,as per Employers Requirements.
- All soil connections under buildings to be 100mm diameter laid at a minimum gradient of 1:40 unless noted otherwise.
- All surface water connections to be 100mm diameter and to be laid at a minimum gradient of 1:80 unless noted otherwise .
- All soil connections and rainwater pipes should be roddable from ground level.
- Rainwater down pipes are to connect to a drain via a rest bend.
- Where drains pass through foundations or other rigid structures a lintel or sleeve is to be used and provision for flexibility is to be made using rocker pipes.
- Backfilling of drain trenches adjacent to building or other structures is to be in accordance with diagram 6 of the Building Regulations.
- Existing foundations and retaining walls must not be undermined by new drainage runs unless agreed in writing with the structural engineer. Contractor to submit method statements and temporary works proposals to the structural engineer for comment prior to commencement of works.
- All drainage excavations should be risk assessed by the contractor to ensure trench safety / stabilisation measures are considered during the construction period. Any excavations left exposed should be inspected by a competent person on a daily basis. Ground conditions should be monitored and tool box talks should include site investigation information to aid the contractors ongoing risk assessment and method of excavation. All excavations should be assessed by a competent person for confined spaces requirements.
- The contractor is to consider phasing of the drainage installation and are to provide temporary drainage measures they determine are required.
- SuDS are to be installed in accordance with the recommendations made within the CIRIA SuDS Manual C753 (with particular attention drawn to chapter 31) and CIRIA Guidance on the Construction of SuDS C768. It is the responsibility of the contractor to consider construction programme of SuDS.
- Detailed design of geocellular attenuation crates is a CDP item and should be based on level, layout and volume details shown. Detailed design information should be provided to the civil engineer to pass comment.
- All manhole cover levels shown are approximate and are to suit the final ground or building levels .
- Manhole covers in block paved areas are to be recessed unless noted otherwise.
- All internal manhole covers are to be non-ventilating and double sealed.
- All external foul and combined water manhole covers in footpaths and paved areas (other than roads) are to be non-ventilating and single sealed unless noted otherwise.
- All external surface water manhole covers are to be non-ventilating unless noted otherwise.
- All manhole covers are to be installed square to paving, kerb lines or buildings.
- For adopted drainage, manhole covers are to be in accordance with the requirements of the DCG or specific water authority requirement.
- Inspection chambers are to have a reduced access piece when the depth is greater than 1.2m to the base of the chamber.

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications. Do not scale from this drawing.

All drawings to be printed in colour.

Notes

- The manhole schedule is to be read in conjunction with the below ground drainage specification, below ground typical drainage detail drawings and the below ground drainage general arrangement drawings.
- All cover levels shown are approximate and are to suit the final ground or building levels .
- Manhole covers in block paved areas are to be recessed unless noted otherwise.
- All internal manhole covers are to be non-ventilating and double sealed.
- All external foul and combined water manhole covers in footpaths and paved areas (other than roads) are to be non-ventilating and single sealed unless noted otherwise.
- All external surface water manhole covers are to be non-ventilating unless noted otherwise.
- All manhole covers are to be installed square to paving, kerb lines or buildings.
- All covers are to be in accordance with the requirements of building regulations.
- For adopted drainage, manhole covers are to be in accordance with the requirements of the dog or specific water authority requirement.
- Inspection chambers are to have a reduced access piece when the depth is greater than 1.2m to the base of the chamber.

NOT FOR CONSTRUCTION

P03	21.11.25	Tke	JRo	Issued for Stage 3
P02	31.10.25	Tke	JRo	Preliminary
P01	03.10.25	JRo	Tke	Preliminary
Rev	Date	By	Chk	Description

ElliottWood

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Project
Battle Street
Reading
RG1 7NU

Drawing Title
Proposed Manhole Schedule

Scale	EWPP Project	Date	Drawn
NTS @ A1	2240067	Oct 2025	JRo

Design Phase	Status	Revision
Preliminary		P03

ElliottWood

Hydraulic Calculations – Block A



Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





Courtyard

Type : Porous Paving

Dimensions	
Exceedance Level (m)	41.200
Depth (m)	0.350
Base Level (m)	40.850
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	2.5
Porosity (%)	30
Length (m)	10.000
Long. Slope (1:X)	1000.00
Width (m)	48.500
Total Volume (m³)	36.375

Inlets	
Inlet	
Inlet Type	Lateral Inflow
Incoming Item(s)	Permeable Paving Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets	
Outlet	
Outgoing Connection	Orifice 2
Outlet Type	Orifice
Diameter (m)	0.022
Coefficient of Discharge	0.600
Invert Level (m)	40.850

Outlet (1)	
Outgoing Connection	4.000
Outlet Type	Free Discharge

Advanced	
Conductivity (m/hr)	216.0

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





Rear Path

Type : Porous Paving

Dimensions	
Exceedance Level (m)	41.200
Depth (m)	0.350
Base Level (m)	40.850
Paving Layer Depth (mm)	100
Membrane Percolation (m/hr)	2.5
Porosity (%)	30
Length (m)	53.698
Long. Slope (1:X)	1000.00
Width (m)	4.016
Total Volume (m³)	16.174

Inlets	
Inlet	
Inlet Type	Lateral Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets	
Outlet	
Outgoing Connection	Orifice 1
Outlet Type	Orifice
Diameter (m)	0.021
Coefficient of Discharge	0.600
Invert Level (m)	40.850

Advanced	
Conductivity (m/hr)	216.0

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		



Attenuation Tank 1.0

Type : Cellular Storage

Dimensions

Exceedance Level (m)	41.200
Depth (m)	0.800
Base Level (m)	39.750
Number of Crates Long	19
Number of Crates Wide	18
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	130.610

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	3.002
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	5.000
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (3)

Inlet Type	Point Inflow
Incoming Item(s)	6.000
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	1.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.003
Outlet Type	Free Discharge

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Manhole Schedule Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SW12	41.200 39.525	Diameter / Length: 0.450	{1} 1.004	Pipe	39.525	Diam/Width:150	Manhole
E:470680.988 N:173528.477	1.675		{a} 1.005	Pipe	39.525	Diam/Width:150	Not Applicable
SW11 (HB)	41.200 39.370	Diameter / Length: 1.200	{1} 1.003	Pipe	39.670	Diam/Width:150	Manhole
E:470680.079 N:173507.640	1.830		{2} Orifice 2	Pipe	39.670	Diam/Width:100	
			{a} 1.004	Pipe	39.670	Diam/Width:150	Not Applicable
SW06	41.600 41.000	Diameter / Length: 0.450					Manhole
E:470699.744 N:173483.139	0.600		{a} 3.000	Pipe	41.000	Diam/Width:150	Not Applicable
SW07	41.200 40.550	Diameter / Length: 0.450	{1} 3.000	Pipe	40.550	Diam/Width:150	Manhole
E:470654.744 N:173483.180	0.650		{a} 3.001	Pipe	40.550	Diam/Width:150	Not Applicable

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
	Company Address: Elliott Wood Partnership		
Report Details: Type: Manhole Schedule Storm Phase: Tank plus P. Paving			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SW08	41.200 40.120	Diameter / Length: 1.050	{1} 3.001	Pipe	40.420	Diam/Width:150	Manhole
E:470655.348	1.080		{2} 4.000	Pipe	40.420	Diam/Width:150	
N:173495.810			{3} Orifice 1	Pipe	40.420	Diam/Width:100	
			{a} 3.002	Pipe	40.420	Diam/Width:150	Not Applicable
SW09	41.200 39.700	Diameter / Length: 1.050					Manhole
E:470651.706	1.500		{a} 5.000	Pipe	40.000	Diam/Width:150	Not Applicable
SW10	41.200 39.700	Diameter / Length: 1.050					Manhole
E:470672.041	1.500		{a} 6.000	Pipe	40.000	Diam/Width:150	Not Applicable
SW03	41.200 40.120	Diameter / Length: 1.050	{1} 2.001	Pipe	40.420	Diam/Width:150	Manhole
E:470681.802	1.080		{2} 1.001	Pipe	40.420	Diam/Width:150	
N:173500.957			{a} 1.002	Pipe	40.420	Diam/Width:150	Not Applicable

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Manhole Schedule Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SW05	41.600 40.835	Diameter / Length: 0.450	{1} 2.000	Pipe	40.835	Diam/Width:150	Manhole
E:470702.320 N:173503.839	0.765		{a} 2.001	Pipe	40.835	Diam/Width:150	Not Applicable
SW04	41.600 41.000	Diameter / Length: 0.450					Manhole
E:470700.025 N:173520.181	0.600		{a} 2.000	Pipe	41.000	Diam/Width:150	Not Applicable
SW01	41.200 40.600	Diameter / Length: 0.450					Manhole
E:470682.940 N:173526.968	0.600		{a} 1.000	Pipe	40.600	Diam/Width:150	Not Applicable
SW02	41.200 40.545	Diameter / Length: 0.450	{1} 1.000	Pipe	40.545	Diam/Width:150	Manhole
E:470682.565 N:173519.184	0.655		{a} 1.001	Pipe	40.545	Diam/Width:150	Not Applicable
Existing Sewer	40.800 39.500	Diameter / Length: 1.200	{1} 1.005	Pipe	39.500	Diam/Width:150	Manhole
E:470681.344 N:173531.571	1.300						Not Applicable

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Inflow Summary Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Rear Path		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (1)	SW04		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (2)	SW05		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (3)	SW02		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (4)	SW02		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (5)	SW03		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (6)	SW03		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	SW03		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	SW08		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	SW08		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (10)	SW08		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (11)	SW08		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	SW08		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (13)	SW08		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (14)	SW09		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (15)	SW09		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (16)	SW09		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (17)	SW09		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (18)	SW03		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (19)	SW10		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (20)	SW10		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (21)	SW03		Time of Concentration	0.006	100	0	100	0.006
Permeable Paving Area	Courtyard		Time of Concentration	0.048	100	0	100	0.048
TOTAL		0.0		0.272				0.272

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
	Report Details: Type: Outfall Details Storm Phase: Tank plus P. Paving			
Company Address:: Elliott Wood Partnership				

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Existing Sewer	Free Discharge			

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Title: Rainfall Analysis Criteria	Company Address: Elliott Wood Partnership			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Prefill Manhole Sumps	☐
Perform No Discharge Analysis	☐

Rainfall

FSR

Type: FSR

Region	England And Wales
M5-60 (mm)	17.0
Ratio R	0.400
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40.000
30.0	0.000
1.0	0.000
100.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW12	FSR: 100 years: +40 %: 15 mins: Summer	41.20 0	39.52 5	39.558	0.033	1.5	0.005	0.000	1.5	1.791	OK
SW11 (HB)	FSR: 100 years: +40 %: 480 mins: Winter	41.20 0	39.37 0	40.538	1.168	1.6	1.322	0.000	1.5	70.606	Surcharged
SW06	FSR: 100 years: +40 %: 15 mins: Summer	41.60 0	41.00 0	41.000	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW07	FSR: 100 years: +40 %: 15 mins: Summer	41.20 0	40.55 0	40.550	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW08	FSR: 100 years: +40 %: 480 mins: Winter	41.20 0	40.12 0	40.539	0.419	4.1	0.363	0.000	4.1	58.133	OK
SW09	FSR: 100 years: +40 %: 480 mins: Winter	41.20 0	39.70 0	40.539	0.839	3.2	0.727	0.000	3.1	35.770	Surcharged
SW10	FSR: 100 years: +40 %: 480 mins: Winter	41.20 0	39.70 0	40.539	0.839	1.7	0.727	0.000	1.6	18.395	Surcharged
SW03	FSR: 100 years: +40 %: 480 mins: Winter	41.20 0	40.12 0	40.539	0.419	4.9	0.363	0.000	4.9	55.829	OK
SW05	FSR: 100 years: +40 %: 15 mins: Winter	41.60 0	40.83 5	40.872	0.037	3.8	0.006	0.000	3.7	1.768	OK
SW04	FSR: 100 years: +40 %: 15 mins: Winter	41.60 0	41.00 0	41.042	0.042	2.9	0.007	0.000	2.8	1.319	OK
SW01	FSR: 100 years: +40 %: 15 mins: Winter	41.20 0	40.60 0	40.674	0.074	0.4	0.012	0.000	0.2	0.091	OK
SW02	FSR: 100 years: +40 %: 15 mins: Winter	41.20 0	40.54 5	40.675	0.130	15.1	0.021	0.000	14.1	7.153	OK
Existing Sewer	FSR: 100 years: +40 %: 15 mins: Summer	40.80 0	39.50 0	39.531	0.031	1.5	0.000	0.000	1.5	1.791	OK

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW12	FSR: 30 years: +0 %: 60 mins: Winter	41.20 0	39.52 5	39.558	0.033	1.5	0.005	0.000	1.5	8.186	OK
SW11 (HB)	FSR: 30 years: +0 %: 360 mins: Winter	41.20 0	39.37 0	40.111	0.741	1.5	0.838	0.000	1.5	52.959	Surcharged
SW06	FSR: 30 years: +0 %: 15 mins: Summer	41.60 0	41.00 0	41.000	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW07	FSR: 30 years: +0 %: 15 mins: Summer	41.20 0	40.55 0	40.550	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW08	FSR: 30 years: +0 %: 15 mins: Winter	41.20 0	40.12 0	40.461	0.341	12.0	0.295	0.000	11.8	6.709	OK
SW09	FSR: 30 years: +0 %: 360 mins: Winter	41.20 0	39.70 0	40.111	0.411	2.2	0.356	0.000	2.2	18.438	OK
SW10	FSR: 30 years: +0 %: 360 mins: Winter	41.20 0	39.70 0	40.111	0.411	1.1	0.356	0.000	1.1	9.470	OK
SW03	FSR: 30 years: +0 %: 15 mins: Winter	41.20 0	40.12 0	40.496	0.376	23.2	0.325	0.000	23.0	10.707	OK
SW05	FSR: 30 years: +0 %: 15 mins: Winter	41.60 0	40.83 5	40.863	0.028	2.1	0.004	0.000	2.0	0.978	OK
SW04	FSR: 30 years: +0 %: 15 mins: Winter	41.60 0	41.00 0	41.031	0.031	1.6	0.005	0.000	1.5	0.732	OK
SW01	FSR: 30 years: +0 %: 15 mins: Winter	41.20 0	40.60 0	40.626	0.026	0.2	0.004	0.000	0.0	0.032	OK
SW02	FSR: 30 years: +0 %: 15 mins: Winter	41.20 0	40.54 5	40.627	0.082	8.4	0.013	0.000	7.8	3.936	OK
Existing Sewer	FSR: 30 years: +0 %: 60 mins: Winter	40.80 0	39.50 0	39.531	0.031	1.5	0.000	0.000	1.5	8.186	OK

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW12	FSR: 1 years: +0 %: 480 mins: Winter	41.20 0	39.52 5	39.556	0.031	1.3	0.005	0.000	1.3	33.938	OK
SW11 (HB)	FSR: 1 years: +0 %: 480 mins: Winter	41.20 0	39.37 0	39.877	0.507	1.3	0.573	0.000	1.3	33.966	Surcharged
SW06	FSR: 1 years: +0 %: 15 mins: Summer	41.60 0	41.00 0	41.000	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW07	FSR: 1 years: +0 %: 15 mins: Summer	41.20 0	40.55 0	40.550	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW08	FSR: 1 years: +0 %: 15 mins: Winter	41.20 0	40.12 0	40.447	0.327	4.6	0.283	0.000	4.6	2.213	OK
SW09	FSR: 1 years: +0 %: 15 mins: Winter	41.20 0	39.70 0	40.044	0.344	6.4	0.298	0.000	6.4	2.582	OK
SW10	FSR: 1 years: +0 %: 15 mins: Winter	41.20 0	39.70 0	40.026	0.326	3.3	0.282	0.000	3.3	1.179	OK
SW03	FSR: 1 years: +0 %: 15 mins: Winter	41.20 0	40.12 0	40.469	0.349	9.6	0.302	0.000	9.5	4.151	OK
SW05	FSR: 1 years: +0 %: 15 mins: Winter	41.60 0	40.83 5	40.853	0.018	0.8	0.003	0.000	0.8	0.396	OK
SW04	FSR: 1 years: +0 %: 15 mins: Winter	41.60 0	41.00 0	41.020	0.020	0.6	0.003	0.000	0.6	0.300	OK
SW01	FSR: 1 years: +0 %: 15 mins: Summer	41.20 0	40.60 0	40.600	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW02	FSR: 1 years: +0 %: 15 mins: Winter	41.20 0	40.54 5	40.595	0.050	3.4	0.008	0.000	3.3	1.598	OK
Existing Sewer	FSR: 1 years: +0 %: 480 mins: Winter	40.80 0	39.50 0	39.529	0.029	1.3	0.000	0.000	1.3	33.938	OK

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Tank plus P. Paving	Company Address: Elliott Wood Partnership		





FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW12	FSR: 100 years: +0 %: 30 mins: Winter	41.200	39.525	39.558	0.033	1.5	0.005	0.000	1.5	3.963	OK
SW11 (HB)	FSR: 100 years: +0 %: 480 mins: Winter	41.200	39.370	40.271	0.901	1.6	1.019	0.000	1.5	68.927	Surcharged
SW06	FSR: 100 years: +0 %: 15 mins: Summer	41.600	41.000	41.000	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW07	FSR: 100 years: +0 %: 15 mins: Summer	41.200	40.550	40.550	0.000	0.0	0.000	0.000	0.0	0.000	OK
SW08	FSR: 100 years: +0 %: 15 mins: Winter	41.200	40.120	40.467	0.347	15.8	0.301	0.000	15.6	9.016	OK
SW09	FSR: 100 years: +0 %: 480 mins: Winter	41.200	39.700	40.272	0.572	2.3	0.495	0.000	2.3	25.708	Surcharged
SW10	FSR: 100 years: +0 %: 480 mins: Winter	41.200	39.700	40.272	0.572	1.2	0.495	0.000	1.2	13.205	Surcharged
SW03	FSR: 100 years: +0 %: 15 mins: Winter	41.200	40.120	40.508	0.388	30.0	0.336	0.000	29.6	13.902	OK
SW05	FSR: 100 years: +0 %: 15 mins: Winter	41.600	40.835	40.867	0.032	2.7	0.005	0.000	2.6	1.259	OK
SW04	FSR: 100 years: +0 %: 15 mins: Winter	41.600	41.000	41.035	0.035	2.0	0.006	0.000	2.0	0.942	OK
SW01	FSR: 100 years: +0 %: 15 mins: Winter	41.200	40.600	40.642	0.042	0.2	0.007	0.000	0.0	0.050	OK
SW02	FSR: 100 years: +0 %: 15 mins: Winter	41.200	40.545	40.642	0.097	10.8	0.015	0.000	10.0	5.083	OK
Existing Sewer	FSR: 100 years: +0 %: 30 mins: Winter	40.800	39.500	39.531	0.031	1.5	0.000	0.000	1.5	3.963	OK

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Attenuation Tank 1.0	FSR: 100 years: +40 %: 480 mins: Winter	40.539	40.539	0.789	0.789	13.7	128.187	0.000	0.000	1.6	71.211		1.855
Courtyard	FSR: 100 years: +40 %: 240 mins: Winter	40.993	40.882	0.133	0.032	4.9	11.670	0.000	0.000	2.8	23.435		67.917
Rear Path	FSR: 100 years: +40 %: 1440 mins: Winter	41.151	41.018	0.247	0.168	0.6	14.516	0.000	0.000	0.1	10.154		10.249

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
	Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		
Company Address:: Elliott Wood Partnership			

Status
OK
OK
OK

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Attenuation Tank 1.0	FSR: 30 years: +0 %: 360 mins: Winter	40.111	40.111	0.361	0.361	9.3	58.708	0.000	0.000	1.5	53.350		55.051
Courtyard	FSR: 30 years: +0 %: 240 mins: Winter	40.940	40.873	0.080	0.023	2.7	7.109	0.000	0.000	1.4	11.622		80.455
Rear Path	FSR: 30 years: +0 %: 1440 mins: Winter	41.042	40.922	0.138	0.072	0.3	7.787	0.000	0.000	0.1	5.385		51.853

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
	Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		
Company Address:: Elliott Wood Partnership			

Status
OK
OK
OK

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Attenuation Tank 1.0	FSR: 1 years: +0 %: 480 mins: Winter	39.878	39.878	0.128	0.128	3.3	20.724	0.000	0.000	1.3	34.281		84.133
Courtyard	FSR: 1 years: +0 %: 480 mins: Winter	40.900	40.862	0.040	0.012	0.7	3.642	0.000	0.000	0.4	6.295		89.987
Rear Path	FSR: 1 years: +0 %: 1440 mins: Winter	40.968	40.877	0.065	0.027	0.1	3.723	0.000	0.000	0.0	2.158		76.982

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
	Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		
Company Address:: Elliott Wood Partnership			

Status
OK
OK
OK

Battle Street : Hydraulic Calculations Block A		Date: 02/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		Company Address: Elliott Wood Partnership			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Attenuation Tank 1.0	FSR: 100 years: +0 %: 480 mins: Winter	40.272	40.272	0.522	0.522	9.8	84.729	0.000	0.000	1.5	69.305	300	35.128
Courtyard	FSR: 100 years: +0 %: 240 mins: Winter	40.961	40.876	0.101	0.026	3.5	8.896	0.000	0.000	1.9	15.953		75.542
Rear Path	FSR: 100 years: +0 %: 1440 mins: Winter	41.082	40.954	0.178	0.104	0.4	10.183	0.000	0.000	0.1	7.221	715	37.043

Battle Street : Hydraulic Calculations Block A	Date: 02/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
	Report Details: Type: Stormwater Controls Summary Storm Phase: Tank plus P. Paving		
Company Address:: Elliott Wood Partnership			

Status
OK
OK
OK

ElliottWood

Hydraulic Calculations – Blocks B-F



Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Elliott Wood Partnership		





P.Paving (Red Area)

Type : Porous Paving

Dimensions	
Exceedance Level (m)	41.100
Depth (m)	0.430
Base Level (m)	40.670
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	2.5
Porosity (%)	30
Length (m)	115.947
Long. Slope (1:X)	1000.00
Width (m)	3.309
Total Volume (m³)	34.532

Inlets	
Inlet	
Inlet Type	Lateral Inflow
Incoming Item(s)	Red Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets	
Outlet	
Outgoing Connection	PP Connection
Outlet Type	Orifice
Diameter (m)	0.014
Coefficient of Discharge	0.600
Invert Level (m)	40.670

Advanced	
Conductivity (m/hr)	216.0

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Elliott Wood Partnership		





P.Paving (Orange)

Type : Porous Paving

Dimensions	
Exceedance Level (m)	41.100
Depth (m)	0.430
Base Level (m)	40.670
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	2.5
Porosity (%)	30
Length (m)	52.247
Long. Slope (1:X)	1000.00
Width (m)	4.668
Total Volume (m³)	21.952

Inlets	
Inlet	
Inlet Type	Lateral Inflow
Incoming Item(s)	Orange Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets	
Outlet	
Outgoing Connection	PP Connection (B)
Outlet Type	Orifice
Diameter (m)	0.018
Coefficient of Discharge	0.600
Invert Level (m)	40.670

Advanced	
Conductivity (m/hr)	216.0

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Elliott Wood Partnership		





P.Paving (Yellow Area)

Type : Porous Paving

Dimensions	
Exceedance Level (m)	41.100
Depth (m)	0.430
Base Level (m)	40.670
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	2.5
Porosity (%)	30
Length (m)	62.985
Long. Slope (1:X)	1000.00
Width (m)	5.401
Total Volume (m³)	30.614

Inlets	
Inlet	
Inlet Type	Lateral Inflow
Incoming Item(s)	Yellow Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets	
Outlet	
Outgoing Connection	PP Connection (C)
Outlet Type	Orifice
Diameter (m)	0.014
Coefficient of Discharge	0.600
Invert Level (m)	40.670

Advanced	
Conductivity (m/hr)	216.0

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Elliott Wood Partnership			



Tank 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	41.100
Depth (m)	0.400
Base Level (m)	40.255
Number of Crates Long	9
Number of Crates Wide	9
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	15.835

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.003
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.004
Outlet Type	Free Discharge

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Elliott Wood Partnership			



Tank 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	41.100
Depth (m)	0.400
Base Level (m)	40.090
Number of Crates Long	32
Number of Crates Wide	6
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	37.090

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	1.006
Bypass Destination	3.001
Capacity Type	(None)
	No Restriction

Outlets

Outlet

Outgoing Connection	1.007
Outlet Type	Free Discharge

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Manhole Schedule Storm Phase: Phase	Company Address: Elliott Wood Partnership			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH15	41.700 40.950	Diameter / Length: 0.450					Manhole
E:470620.414 N:173422.989	0.750		{a} 1.000	Pipe	40.950	Diam/Width:150	Not Applicable
MH19	41.100 40.300	Diameter / Length: 1.050	{1} 1.002	Pipe	40.300	Diam/Width:150	Manhole
E:470616.491 N:173474.911	0.800		{2} 2.000	Pipe	40.300	Diam/Width:150	
			{a} 1.003	Pipe	40.300	Diam/Width:150	Not Applicable
TWMH	41.160 39.820	Diameter / Length: 1.200	{1} 1.008	Pipe	39.820	Diam/Width:225	Manhole
E:470638.616 N:173534.920	1.340						
							Not Applicable
MH27	41.100 40.080	Diameter / Length: 1.200	{1} 1.007	Pipe	40.080	Diam/Width:225	Manhole
E:470638.182 N:173523.557	1.020		{2} PP Connection (C)	Pipe	40.080	Diam/Width:100	
			{a} 1.008	Pipe	40.080	Diam/Width:225	Not Applicable
MH20	41.100 39.815	Diameter / Length: 1.050	{1} 1.004	Pipe	40.215	Diam/Width:225	Manhole
E:470630.051 N:173474.517	1.285		{2} PP Connection	Pipe	40.215	Diam/Width:100	
			{a} 1.005	Pipe	40.215	Diam/Width:225	Not Applicable

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Manhole Schedule Storm Phase: Phase	Company Address: Elliott Wood Partnership			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH21	41.100 40.115	Diameter / Length: 1.050	{1} 1.005	Pipe	40.115	Diam/Width:225	Manhole
E:470630.918 N:173494.350	0.985		{2} PP Connection (B)	Pipe	40.115	Diam/Width:100	
			{a} 1.006	Pipe	40.115	Diam/Width:225	Not Applicable
MH16	41.700 40.900	Diameter / Length: 0.450	{1} 1.000	Pipe	40.900	Diam/Width:150	Manhole
E:470616.362 N:173423.913	0.800						
			{a} 1.001	Pipe	40.900	Diam/Width:150	Not Applicable
MH18	41.100 40.400	Diameter / Length: 0.450					Manhole
E:470616.480 N:173483.227	0.700						
			{a} 2.000	Pipe	40.400	Diam/Width:150	Not Applicable
Manhole	41.100 40.500	Diameter / Length: 0.450					Manhole
E:470633.380 N:173519.664	0.600						
			{a} 5.000	Pipe	40.500	Diam/Width:150	Not Applicable
MH17	41.500 40.650	Diameter / Length: 0.450	{1} 1.001	Pipe	40.650	Diam/Width:150	Manhole
E:470616.362 N:173444.069	0.850						
			{a} 1.002	Pipe	40.650	Diam/Width:150	Not Applicable

Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Manhole Schedule Storm Phase: Phase		Company Address: Elliott Wood Partnership			

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH23	41.150 40.580	Diameter / Length: 0.450					Manhole
E:470616.045 N:173519.598	0.570						
			{a} 3.000	Pipe	40.580	Diam/Width:150	Not Applicable
MH24	41.100 40.500	Diameter / Length: 0.450					Manhole
E:470623.769 N:173512.614	0.600						
			{a} 4.000	Pipe	40.500	Diam/Width:150	Not Applicable
MH26	41.100 40.400	Diameter / Length: 1.050	{1} 3.000	Pipe	40.400	Diam/Width:150	Manhole
E:470629.723 N:173515.998	1.100		{2} 4.000	Pipe	40.400	Diam/Width:150	
			{3} 5.000	Pipe	40.400	Diam/Width:150	
			{a} 3.001	Pipe	40.400	Diam/Width:150	Not Applicable

Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Inflow Summary Storm Phase: Phase		Company Address: Elliott Wood Partnership			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Block B	MH15		Time of Concentration	0.017	100	0	100	0.017
Block C	MH17		Time of Concentration	0.016	100	0	100	0.016
Block D	MH19		Time of Concentration	0.014	100	0	100	0.014
Block E1	MH24		Time of Concentration	0.014	100	0	100	0.014
Block E2	MH18		Time of Concentration	0.014	100	0	100	0.014
Block F	MH23		Time of Concentration	0.011	100	0	100	0.011
Block F (1)	Manhole		Time of Concentration	0.009	100	0	100	0.009
Orange Area	P.Paving (Orange)		Time of Concentration	0.024	100	0	100	0.024
Red Area	P.Paving (Red Area)		Time of Concentration	0.039	100	0	100	0.039
Yellow Area	P.Paving (Yellow Area)		Time of Concentration	0.034	100	0	100	0.034
TOTAL		0.0		0.193				0.193

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
	Report Details: Type: Outfall Details Storm Phase: Phase			
Company Address: Elliott Wood Partnership				

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
TWMH	Free Discharge			

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Title: Rainfall Analysis Criteria	Company Address: Elliott Wood Partnership			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Prefill Manhole Sumps	☐
Perform No Discharge Analysis	☐

Rainfall

FSR	Type: FSR
-----	-----------

Region	England And Wales
M5-60 (mm)	17.0
Ratio R	0.400
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40.000
100.0	0.000
30.0	0.000
1.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership		





FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH15	FSR: 100 years: +40 %: 15 mins: Winter	41.70 0	40.95 0	41.029	0.079	9.0	0.013	0.000	8.8	4.155	OK
MH19	FSR: 100 years: +40 %: 15 mins: Winter	41.10 0	40.30 0	40.623	0.323	26.9	0.280	0.000	25.6	14.886	Surcharged
TWMH	FSR: 100 years: +40 %: 480 mins: Winter	41.16 0	39.82 0	39.835	0.015	0.7	0.000	0.000	0.7	31.140	OK
MH27	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	40.08 0	40.579	0.499	0.8	0.564	0.000	0.7	31.157	Surcharged
MH20	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	39.81 5	40.579	0.764	3.3	0.662	0.000	3.1	36.302	Surcharged
MH21	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	40.11 5	40.579	0.464	3.2	0.402	0.000	3.0	36.045	Surcharged
MH16	FSR: 100 years: +40 %: 15 mins: Winter	41.70 0	40.90 0	40.969	0.069	8.8	0.011	0.000	8.7	4.147	OK
MH18	FSR: 100 years: +40 %: 15 mins: Winter	41.10 0	40.40 0	40.638	0.238	7.4	0.038	0.000	6.3	3.446	Surcharged
Manhole	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	40.50 0	40.579	0.079	0.6	0.013	0.000	0.6	6.373	OK
MH17	FSR: 100 years: +40 %: 15 mins: Winter	41.50 0	40.65 0	40.810	0.160	17.1	0.025	0.000	13.1	8.004	Surcharged
MH23	FSR: 100 years: +40 %: 15 mins: Winter	41.15 0	40.58 0	40.634	0.054	5.8	0.009	0.000	5.7	2.675	OK
MH24	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	40.50 0	40.579	0.079	0.8	0.013	0.000	0.8	9.331	OK
MH26	FSR: 100 years: +40 %: 480 mins: Winter	41.10 0	40.40 0	40.579	0.179	2.0	0.155	0.000	2.0	23.103	Surcharged

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership		





FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH15	FSR: 100 years: +0 %: 15 mins: Winter	41.70 0	40.95 0	41.015	0.065	6.4	0.010	0.000	6.3	2.965	OK
MH19	FSR: 100 years: +0 %: 15 mins: Winter	41.10 0	40.30 0	40.473	0.173	21.4	0.150	0.000	19.6	10.631	Surcharged
TWMH	FSR: 100 years: +0 %: 960 mins: Summer	41.16 0	39.82 0	39.835	0.015	0.7	0.000	0.000	0.7	49.342	OK
MH27	FSR: 100 years: +0 %: 480 mins: Winter	41.10 0	40.08 0	40.402	0.322	0.8	0.364	0.000	0.7	26.161	Surcharged
MH20	FSR: 100 years: +0 %: 480 mins: Winter	41.10 0	39.81 5	40.402	0.587	2.8	0.508	0.000	2.6	28.363	OK
MH21	FSR: 100 years: +0 %: 480 mins: Winter	41.10 0	40.11 5	40.402	0.287	2.7	0.249	0.000	2.5	29.390	Surcharged
MH16	FSR: 100 years: +0 %: 15 mins: Winter	41.70 0	40.90 0	40.958	0.058	6.3	0.009	0.000	6.1	2.963	OK
MH18	FSR: 100 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.481	0.081	5.3	0.013	0.000	4.5	2.462	OK
Manhole	FSR: 100 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.537	0.037	3.5	0.006	0.000	3.5	1.623	OK
MH17	FSR: 100 years: +0 %: 15 mins: Winter	41.50 0	40.65 0	40.735	0.085	12.1	0.013	0.000	11.6	5.720	OK
MH23	FSR: 100 years: +0 %: 15 mins: Winter	41.15 0	40.58 0	40.625	0.045	4.1	0.007	0.000	4.1	1.913	OK
MH24	FSR: 100 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.549	0.049	5.1	0.008	0.000	5.1	2.381	OK
MH26	FSR: 100 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.492	0.092	12.6	0.080	0.000	12.1	5.926	OK

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership		





FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH15	FSR: 30 years: +0 %: 15 mins: Winter	41.70 0	40.95 0	41.006	0.056	5.0	0.009	0.000	4.9	2.297	OK
MH19	FSR: 30 years: +0 %: 15 mins: Winter	41.10 0	40.30 0	40.428	0.128	17.1	0.111	0.000	15.9	8.240	OK
TWMH	FSR: 30 years: +0 %: 960 mins: Summer	41.16 0	39.82 0	39.835	0.015	0.7	0.000	0.000	0.7	42.988	OK
MH27	FSR: 30 years: +0 %: 480 mins: Winter	41.10 0	40.08 0	40.331	0.251	0.8	0.284	0.000	0.7	23.039	Surcharged
MH20	FSR: 30 years: +0 %: 480 mins: Winter	41.10 0	39.81 5	40.331	0.516	2.0	0.447	0.000	2.0	23.459	OK
MH21	FSR: 30 years: +0 %: 480 mins: Winter	41.10 0	40.11 5	40.331	0.216	2.1	0.187	0.000	2.0	24.939	OK
MH16	FSR: 30 years: +0 %: 15 mins: Winter	41.70 0	40.90 0	40.950	0.050	4.9	0.008	0.000	4.7	2.294	OK
MH18	FSR: 30 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.445	0.045	4.1	0.007	0.000	4.1	1.910	OK
Manhole	FSR: 30 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.533	0.033	2.7	0.005	0.000	2.7	1.254	OK
MH17	FSR: 30 years: +0 %: 15 mins: Winter	41.50 0	40.65 0	40.722	0.072	9.4	0.012	0.000	8.9	4.435	OK
MH23	FSR: 30 years: +0 %: 15 mins: Winter	41.15 0	40.58 0	40.620	0.040	3.2	0.006	0.000	3.1	1.485	OK
MH24	FSR: 30 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.543	0.043	4.0	0.007	0.000	3.9	1.847	OK
MH26	FSR: 30 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.480	0.080	9.7	0.069	0.000	9.3	4.594	OK

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025		
	Designed by: JRo	Checked by: TKe	Approved By: TKe
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership		





FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH15	FSR: 1 years: +0 %: 15 mins: Winter	41.70 0	40.95 0	40.984	0.034	2.0	0.005	0.000	2.0	0.939	OK
MH19	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	40.30 0	40.373	0.073	6.9	0.063	0.000	6.4	3.359	OK
TWMH	FSR: 1 years: +0 %: 360 mins: Winter	41.16 0	39.82 0	39.834	0.014	0.6	0.000	0.000	0.6	13.785	OK
MH27	FSR: 1 years: +0 %: 360 mins: Winter	41.10 0	40.08 0	40.178	0.098	0.6	0.111	0.000	0.6	13.794	OK
MH20	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	39.81 5	40.264	0.449	3.6	0.389	0.000	3.6	2.114	OK
MH21	FSR: 1 years: +0 %: 360 mins: Winter	41.10 0	40.11 5	40.179	0.064	1.1	0.055	0.000	1.1	10.136	OK
MH16	FSR: 1 years: +0 %: 15 mins: Winter	41.70 0	40.90 0	40.932	0.032	2.0	0.005	0.000	1.9	0.937	OK
MH18	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.429	0.029	1.7	0.005	0.000	1.6	0.780	OK
Manhole	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.521	0.021	1.1	0.003	0.000	1.1	0.514	OK
MH17	FSR: 1 years: +0 %: 15 mins: Winter	41.50 0	40.65 0	40.694	0.044	3.8	0.007	0.000	3.6	1.810	OK
MH23	FSR: 1 years: +0 %: 15 mins: Winter	41.15 0	40.58 0	40.605	0.025	1.3	0.004	0.000	1.3	0.604	OK
MH24	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	40.50 0	40.528	0.028	1.6	0.004	0.000	1.6	0.753	OK
MH26	FSR: 1 years: +0 %: 15 mins: Winter	41.10 0	40.40 0	40.450	0.050	3.9	0.043	0.000	3.7	1.871	OK

Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Elliott Wood Partnership			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank 1	FSR: 100 years: +40 %: 480 mins: Winter	40.579	40.579	0.324	0.324	3.7	12.466	0.000	0.000	3.3	34.713	285	21.279
P.Paving (Red Area)	FSR: 100 years: +40 %: 1440 mins: Winter	41.051	40.907	0.265	0.237	1.0	30.615	0.000	0.000	0.0	6.118		11.344
P.Paving (Orange)	FSR: 100 years: +40 %: 1440 mins: Winter	40.968	40.877	0.246	0.207	0.6	17.341	0.000	0.000	0.1	8.944		21.005
P.Paving (Yellow Area)	FSR: 100 years: +40 %: 1440 mins: Winter	40.986	40.922	0.253	0.252	0.8	26.422	0.000	0.000	0.0	6.323		13.692
Tank 2	FSR: 100 years: +40 %: 480 mins: Winter	40.579	40.579	0.489	0.489	4.9	36.597	0.000	0.000	0.8	30.287		1.330

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
	Report Details: Type: Stormwater Controls Summary Storm Phase: Phase			
			Company Address: Elliott Wood Partnership	

Status
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Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Elliott Wood Partnership			



FSR: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank 1	FSR: 100 years: +0 %: 480 mins: Winter	40.402	40.402	0.147	0.147	2.6	5.658	0.000	0.000	2.7	27.466		64.270
P.Paving (Red Area)	FSR: 100 years: +0 %: 1440 mins: Winter	40.974	40.828	0.188	0.158	0.7	21.627	0.000	0.000	0.0	4.875		37.372
P.Paving (Orange)	FSR: 100 years: +0 %: 1440 mins: Winter	40.898	40.802	0.176	0.132	0.4	12.158	0.000	0.000	0.1	6.851	410	44.617
P.Paving (Yellow Area)	FSR: 100 years: +0 %: 1440 mins: Winter	40.912	40.842	0.179	0.172	0.6	18.650	0.000	0.000	0.0	5.131		39.079
Tank 2	FSR: 100 years: +0 %: 480 mins: Winter	40.402	40.402	0.312	0.312	4.0	28.457	0.000	0.000	0.8	25.466		23.275

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership			

Status
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Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Elliott Wood Partnership			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank 1	FSR: 30 years: +0 %: 15 mins: Winter	40.340	40.340	0.085	0.085	15.9	3.278	0.000	0.000	10.3	7.314		79.300
P.Paving (Red Area)	FSR: 30 years: +0 %: 1440 mins: Winter	40.932	40.787	0.146	0.117	0.5	16.701	0.000	0.000	0.0	4.067		51.638
P.Paving (Orange)	FSR: 30 years: +0 %: 1440 mins: Winter	40.859	40.763	0.137	0.093	0.3	9.321	0.000	0.000	0.0	5.452		57.540
P.Paving (Yellow Area)	FSR: 30 years: +0 %: 1440 mins: Winter	40.871	40.797	0.138	0.127	0.5	14.301	0.000	0.000	0.0	4.324		53.287
Tank 2	FSR: 30 years: +0 %: 480 mins: Winter	40.331	40.331	0.241	0.241	3.1	22.010	0.000	0.000	0.8	22.414	250	40.658

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
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Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership			

Status
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Battle Street : Hydraulic Calculations Blocks B-F		Date: 04/09/2025			
		Designed by: JRo	Checked by: TKe		Approved By: TKe
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Elliott Wood Partnership			



FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank 1	FSR: 1 years: +0 %: 15 mins: Winter	40.302	40.302	0.047	0.047	6.4	1.819	0.000	0.000	3.6	2.596		88.516
P.Paving (Red Area)	FSR: 1 years: +0 %: 1440 mins: Winter	40.854	40.718	0.068	0.048	0.3	7.637	0.000	0.000	0.0	2.148		77.886
P.Paving (Orange)	FSR: 1 years: +0 %: 1440 mins: Winter	40.786	40.704	0.063	0.034	0.2	4.280	0.000	0.000	0.0	2.354		80.501
P.Paving (Yellow Area)	FSR: 1 years: +0 %: 1440 mins: Winter	40.797	40.719	0.064	0.049	0.2	6.575	0.000	0.000	0.0	2.405		78.523
Tank 2	FSR: 1 years: +0 %: 360 mins: Winter	40.179	40.179	0.089	0.089	1.7	8.080	0.000	0.000	0.6	13.312		78.216

Battle Street : Hydraulic Calculations Blocks B-F	Date: 04/09/2025			
	Designed by: JRo	Checked by: TKe	Approved By: TKe	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Elliott Wood Partnership			

Status
OK
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