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Berrow Green, Martley

Job Number: LE23827	**Date**: March 2024	**Client**: Hayfield
Prepared By: WT	**Approved By**: FJ	**Ref:** BGM-LE-GEN-XX-TN-CE-TN01

LLFA Response Statement

1 Introduction

1.1 This technical note has been prepared in response to comments raised by the Lead Local Flood Authority (LLFA) Ref. M2301711OUT - LLFA drainage strategy comments, dated February 2024 for the proposed development at Berrow Green, Martley. The full list of LLFA comments are provided in **Appendix A** for reference and Link's responses to each comment are provided in Section 2 of this report. This report should be read in conjunction with the previously submitted Flood Risk Assessment (FRA) Ref. BGM-LE-GEN-XX-RP-CE-FRA01-P1-Flood Risk Assessment.

2 Responses to LLFA Comments

2.1 LLFA Comment: *"Drainage Hierarchy - Discharging surface water from the site has been considered in accordance with the drainage hierarchy. In accordance with the drainage hierarchy and Box 1.2 of the Ciria SuDS manual (C753), rainwater harvesting should be the first means of surface water discharge which is entirely appropriate for this development type with the use of water butts. Please include water butts in further plans. Infiltration testing at the BRE 365 standard has not been proposed and will need to be conducted to confirm if infiltration SuDS are unfeasible as a surface water discharge method. If tests find infiltration to be feasible, surface water discharge via infiltration SuDS will be expected within the drainage network. There is an existing open watercourse (ditch) parallel to the eastern boundary, current proposals are to discharge surface water to this ditch. The ditch doesn't appear to lead anywhere and may not be suitable for an outfall. Further details need to be submitted clarifying the condition, ownership and where the ditch leads to. If the ditch leads to a culverted watercourse or drain, the condition of the pipework and able capacity will need to be confirmed along with any remedial works needed."*

Link Response: Acknowledged, following confirmation of a finalised site layout at detailed design stage, rainwater harvesting in the form of water butts can be proposed throughout the development. However, it

should be noted that rainwater harvesting such as water butts will be insufficient for the discharge of surface water from the site and therefore another primary form of discharge is needed in keeping with the Drainage Hierarchy.

The need for infiltration testing to BRE 365 is acknowledged to determine its viability within this development. However, given that the drainage strategy proposed is in support of an Outline Planning Application, it is recommended that appropriate infiltration testing is to be conducted at detailed design stage following any grant of outline planning in accordance with a suitably worded planning condition relating to infiltration testing to BRE 365. Should infiltration testing be proven to be viable or partially viable within the site, then the drainage strategy can be augmented at detailed design stage to take advantage of this for a surface water outfall.

Regarding the existing ditch on the eastern boundary, it is also recommended that condition testing of the watercourse is to be carried out at detailed design stage following any grant of outline planning. However, it should be noted that the proposed drainage strategy offers a significant betterment on the existing drainage mechanism. Figure 2 in the accompanying FRA demonstrates how the existing site drains via the topography into the eastern ditch, hence the surface water strategy for the development replicates the existing drainage mechanism by discharging into this watercourse. Furthermore, a betterment is provided as the strategy restricts flows for all storm events up to and including the 1 in 100 year event (with climate change allowance) to the greenfield flow for the entire developable area, which was found to be 4.75l/s (see rationale for greenfield flow in Section 2.2). This betterment can be seen in Table 4 of the accompanying FRA which outlines the reduction in flow rates between the existing and proposed situations.

2.2 LLFA Comment: *"Calculations - The greenfield runoff rate (Qbar) has been calculated at 4.3l/s for the site and the proposed discharge rate is 4.75l/s up to the 1:100-year return period (1% AEP) + 40% climate change (CC) uplift. Why is the proposed discharge rate higher than Qbar, please justify this. The total attenuation storage proposed for the impermeable area is 1,486m3 up to the 1%AEP + 40% CC. There are no drainage calculations in the appendix to review."*

Link Response: Please refer to the calculation extract Ref. BGM-LE-GEN-XX-CAL-CE-002 - Greenfield Runoff Rates Calculations in Appendix D of the FRA, which is repeated in **Appendix B** of this note. The Qbar for the total area within the redline boundary was found to be 7l/s however, not all of this area is to be developed. As outlined in Section 4.3.5 of the FRA, the flow rate restriction of 4.75l/s is based on the total impermeable catchment discharging into the watercourse, which is determined from the ratio of the impermeable area to the total site area within the redline boundary. Full drainage calculations were included in Appendix D of the accompanying FRA and are repeated in **Appendix B** of this note for reference.

2.3 LLFA Comment: *"SuDS Design - The site will be split into two catchments, each draining via pipework to two separate attenuation ponds. The ponds are appreciated as above ground SuDS are favoured by the LLFA. Please could detailed drainage designs show the permanently wetted pond area and include a staged base, shelves, and informal design to adhere to the SuDS objectives. Where water volume considerations reduce flood risk, water quality is restored, and biodiversity and amenity value are enhanced. These objectives can be achieved through a SuDS design distributed around the entire site, where interception and storage are as close to the source of rainfall as possible and conveyance with treatment is above ground before entering the pond. The LLFA prefers two stages of treatment in the SuDS train, please consider the addition of further SuDS. SWDP 29-B. states "Lack of space, prohibitive costs, inadequate infiltration and land contamination will not be accepted as reasons for not including SuDS. Given the wide range of SuDS techniques available, there is a sustainable drainage solution to suit all sites.""*

Link Response: It should be noted that the two basins proposed for the development are to be detention basins with no permanent water level, as opposed to ponds/wetlands with a permanent water level. Therefore, details of wetted area, staged base, shelves, and informal area are not applicable to this development.

The recommendation for inclusion of additional SuDS features is acknowledged. However, it can be considered that the four pillars of SuDS design have been achieved in the current design through quantity control of water volume, quality control through sufficient treatment provided by the detention basins (see Section 2.4 below), and biodiversity and amenity value provided by the two detention basins. Furthermore, as per Section 4 in the FRA, every opportunity to include SuDS features within the development has been taken given the information available at Outline Planning Stage. Once additional information on infiltration capabilities (see Section 2.1) and a finalised site layout is made available at detailed design stage, the inclusion of additional SuDS features around the development can be considered which will further enhance the current design.

2.4 LLFA Comment: *"Water Treatment - A water treatment appraisal in line with the Ciria simple index approach will need to be completed and show the mitigation of all pollution hazards on site."*

Link Response: As per Table 26.2 in CIRIA 753 The SuDS Manual, the site is classed as having individual property driveways and low traffic roads and therefore is considered a site with a 'Low' Pollution Hazard Level. The corresponding pollution indices for this hazard level for the three main sources of pollution are provided below in Table 1.

Table 26.3 in CIRIA 753 provides mitigation indices for various SuDS features against the three main sources of pollution. The corresponding mitigation indices for detention basins for each of the sources of pollution are provided below in Table 2.

Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Low	0.5	0.4	0.4

Table 1 – Pollution Hazard Level and Indices

SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Detention Basin	0.5	0.5	0.6

Table 2 – SuDS Features and Mitigation Indices

This demonstrates that the two proposed detention basins are sufficient for mitigating against potential sources of pollution on site as the mitigation index for each source of pollution is greater than or equal to the corresponding pollution index. As above, the inclusion of additional SuDS features on the site at detailed design stage is welcomed and will help to enhance the pollution treatment currently proposed.

2.5 LLFA Comment: *"Exceedance Flow Route - Exceedance flow route drawings are not within the appendix as stated. An exceedance flow route drawing, demonstrating site wide flows will not be directed to properties or private land and will be directed to roads and areas of POS will need to be submitted in further plans."*

Link Response: Please refer to **Appendix C** which includes an exceedance flow plan (Ref. BGM-LE-GEN-XX-DR-CE-002) for the development. This demonstrates that flows generated by an exceedance flood event will be directed through the proposed highways away from properties and private land towards the existing ditch and proposed detention basins, thus ensuring that the site is suitably mitigated against exceedance flows.

2.6 LLFA Comment: *"Maintenance - SuDS maintenance details are satisfactory in principle. A detailed maintenance plan including a schedule for all drainage assets, who will provide the maintenance and how the maintenance of drainage assets in private ownership will be communicated to private landowners, will need to be submitted in further plans."*

Link Response: Acknowledged, as noted in Section 5.3 of the FRA, the maintenance regimes detailed are initial recommendations and shall be tailored to suit the final drainage strategy at detailed design stage. It is recommended that a suitably worded planning condition is specified following any grant of planning permission requiring full details of drainage maintenance to be provided.

3 Conclusion

3.1 The proposals submitted within this technical note address all LLFA comments and are in full accordance with national and local policies, as well as LLFA design guides. The proposals offer a strategy that is suitable for the proposed application. Should further detailed information be required this can be provided as part of suitable planning condition.

APPENDIX A – M2301711OUT - LLFA drainage strategy comments

worcestershire
countycouncil

Lead Local Flood Authority Response in respect of M/23/01711/OUT - Outline planning permission for up to 55 dwellings (with means of access to the site be considered at this stage and all other matters reserved) at Land At (Os 7500 5952), Berrow Green Road, Martley

Statutory obligations

These comments represent those of Worcestershire County Council as the Lead Local Flood Authority (as determined by the Flood and Water Management Act 2010) and are officer comments only.

The LLFA have reviewed the submitted information relating to surface water drainage only; South Worcestershire Land Drainage Partnership will provide comments in relation to flood risk.

Introduction

This application is for the development of 55 dwellings and associated infrastructure on 3.86ha of predeveloped greenfield land. The total proposed impermeable area is 1.49ha.

Drainage hierarchy

Discharging surface water from the site has been considered in accordance with the drainage hierarchy. In accordance with the drainage hierarchy and Box 1.2 of the Ciria SuDS manual (C753), rainwater harvesting should be the first means of surface water discharge which is entirely appropriate for this development type with the use of water butts. Please include water butts in further plans. Infiltration testing at the BRE 365 standard has not been proposed and will need to be conducted to confirm if infiltration SuDS are unfeasible as a surface water discharge method. If tests find infiltration to be feasible, surface water discharge via infiltration SuDS will be expected within the drainage network. There is an existing open watercourse (ditch) parallel to the eastern boundary, current proposals are to discharge surface water to this ditch. The ditch doesn't appear to lead anywhere and may not be suitable for an outfall. Further details need to be submitted clarifying the condition, ownership and where the ditch leads to. If the ditch leads to a culverted watercourse or drain, the condition of the pipework and able capacity will need to be confirmed along with any remedial works needed.

Calculations

The greenfield runoff rate (Qbar) has been calculated at 4.3l/s for the site and the proposed discharge rate is 4.75l/s up to the 1:100-year return period (1% AEP) + 40% climate change (CC) uplift. Why is the proposed discharge rate higher than Qbar, please justify this. The total attenuation storage proposed for the impermeable area

North Worcestershire Water Management On behalf of the LLFA

● lfaconsultee@worcestershire.gov.uk ● www.worcestershire.gov.uk/flooding

is 1,486m^3 up to the 1%AEP + 40% CC. There are no drainage calculations in the appendix to review.

SuDS design

The site will be split into two catchments, each draining via pipework to two separate attenuation ponds. The ponds are appreciated as above ground SuDS are favoured by the LLFA. Please could detailed drainage designs show the permanently wetted pond area and include a staged base, shelves, and informal design to adhere to the SuDS objectives. Where water volume considerations reduce flood risk, water quality is restored, and biodiversity and amenity value are enhanced. These objectives can be achieved through a SuDS design distributed around the entire site, where interception and storage are as close to the source of rainfall as possible and conveyance with treatment is above ground before entering the pond. The LLFA prefers two stages of treatment in the SuDS train, please consider the addition of further SuDS. SWDP 29-B. states *"Lack of space, prohibitive costs, inadequate infiltration and land contamination will not be accepted as reasons for not including SuDS. Given the wide range of SuDS techniques available, there is a sustainable drainage solution to suit all sites."*

Water treatment

A water treatment appraisal in line with the Ciria simple index approach will need to be completed and show the mitigation of all pollution hazards on site.

Exceedance flow route

Exceedance flow route drawings are not within the appendix as stated. An exceedance flow route drawing, demonstrating site wide flows will not be directed to properties or private land and will be directed to roads and areas of POS will need to be submitted in further plans.

Maintenance

SuDS maintenance details are satisfactory in principle. A detailed maintenance plan including a schedule for all drainage assets, who will provide the maintenance and how the maintenance of drainage assets in private ownership will be communicated to private landowners, will need to be submitted in further plans.

Conclusion

It is not known if the site will be suitable for infiltration SuDS and the only other way to drain the site is to a roadside ditch which appears to be disconnected from other watercourses. The flow route of the ditch, if any, and capacity need to be confirmed before any conditions or approval can be recommended. This is to ensure there is a

viable method for draining the site. All appendices are missing from the FRA/DS, please can these be amended. I would like to place a holding objection until the details requested have been submitted and approved by the LPA.

Jason Trueman
For the Lead Local Flood Authority

APPENDIX B – Supporting Calculations

B1. BGM-LE-GEN-XX-CAL-CE-001 - Drainage Simulation Analysis Results

B2. BGM-LE-GEN-XX-CAL-CE-002 - Greenfield Runoff Rates Calculations

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Pond

Type : Pond

Dimensions

Exceedance Level (m)	68.650
Depth (m)	1.500
Base Level (m)	67.150
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.074
Total Volume (m³)	1284.123

Depth (m)	Area (m²)	Volume (m³)
0.000	800.00	0.000
1.500	1530.00	1718.173

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	AS1.008
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	AS1.009
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	76.944
Friction Scheme	Manning's n
n	0.03

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		

Pond (1)

Type : Pond

Dimensions

Exceedance Level (m)	68.500
Depth (m)	1.500
Base Level (m)	67.000
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	6.004
Total Volume (m³)	202.843

Depth (m)	Area (m²)	Volume (m³)
0.000	37.00	0.000
1.500	486.00	328.548

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	BS1.002
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	BS1.003
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	49.961
Friction Scheme	Manning's n
n	0.03

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
65% Impermeable	AS3		Time of Concentration	0.193	80	0	80	0.154
65% Impermeable (1)	AS1		Time of Concentration	0.120	80	0	80	0.096
65% Impermeable (2)	AS2		Time of Concentration	0.071	80	0	80	0.057
65% Impermeable (3)	AS4		Time of Concentration	0.071	80	0	80	0.057
65% Impermeable (4)	AS2		Time of Concentration	0.030	80	0	80	0.024
65% Impermeable (5)	AS4		Time of Concentration	0.064	80	0	80	0.051
65% Impermeable (6)	AS6		Time of Concentration	0.042	80	0	80	0.033
65% Impermeable (7)	AS8		Time of Concentration	0.038	80	0	80	0.030
65% Impermeable (8)	AS7		Time of Concentration	0.050	80	0	80	0.040
65% Impermeable (9)	AS7		Time of Concentration	0.035	80	0	80	0.028
65% Impermeable (10)	AS9		Time of Concentration	0.042	80	0	80	0.033
65% Impermeable (11)	AS6		Time of Concentration	0.065	80	0	80	0.052
65% Impermeable (12)	AS12		Time of Concentration	0.110	80	0	80	0.088
65% Impermeable (13)	AS12		Time of Concentration	0.042	80	0	80	0.033
65% Impermeable (14)	AS13		Time of Concentration	0.057	80	0	80	0.046
65% Impermeable (15)	AS14		Time of Concentration	0.084	80	0	80	0.067
65% Impermeable (16)	AS16		Time of Concentration	0.104	80	0	80	0.083
65% Impermeable (17)	AS11		Time of Concentration	0.094	80	0	80	0.075
65% Impermeable (18)	AS17		Time of Concentration	0.095	80	0	80	0.076
65% Impermeable (19)	AS17		Time of Concentration	0.063	80	0	80	0.050
65% Impermeable (20)	BS3		Time of Concentration	0.116	80	0	80	0.093
65% Impermeable (21)	BS2		Time of Concentration	0.064	80	0	80	0.052

65% Impermeable (22)	AS10		Time of Concentration	0.026	80	0	80	0.021
100% Impermeable	AS12		Time of Concentration	0.030	100	0	100	0.030
100% Impermeable (1)	AS13		Time of Concentration	0.010	100	0	100	0.010
100% Impermeable (2)	AS14		Time of Concentration	0.020	100	0	100	0.020
100% Impermeable (3)	AS15		Time of Concentration	0.010	100	0	100	0.010
100% Impermeable (4)	AS16		Time of Concentration	0.028	100	0	100	0.028
100% Impermeable (5)	AS1		Time of Concentration	0.011	100	0	100	0.011
100% Impermeable (6)	AS2		Time of Concentration	0.016	100	0	100	0.016
100% Impermeable (7)	AS2		Time of Concentration	0.012	100	0	100	0.012
100% Impermeable (8)	AS4		Time of Concentration	0.022	100	0	100	0.022
100% Impermeable (9)	AS5		Time of Concentration	0.013	100	0	100	0.013
100% Impermeable (10)	AS7		Time of Concentration	0.044	100	0	100	0.044
100% Impermeable (11)	AS8		Time of Concentration	0.021	100	0	100	0.021
100% Impermeable (12)	AS6		Time of Concentration	0.011	100	0	100	0.011
100% Impermeable (13)	AS9		Time of Concentration	0.036	100	0	100	0.036
100% Impermeable (14)	AS10		Time of Concentration	0.008	100	0	100	0.008
100% Impermeable (15)	AS11		Time of Concentration	0.023	100	0	100	0.023
100% Impermeable (16)	AS17		Time of Concentration	0.002	100	0	100	0.002
100% Impermeable (17)	BS1		Time of Concentration	0.023	100	0	100	0.023
100% Impermeable (18)	BS2		Time of Concentration	0.013	100	0	100	0.013
100% Impermeable (19)	BS3		Time of Concentration	0.036	100	0	100	0.036
TOTAL		**0.0**		**2.066**				**1.731**

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	30.0
Region	England And Wales
M5-60 (mm)	18.9
Ratio R	0.396

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
150	0.00	0.00

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:		

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address:		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
BS5	Free Discharge		
AS19	Free Discharge		

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

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
Perform No Discharge Analysis	☐

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

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
AS2	FEH: 2 years: +0 %: 15 mins: Summer	72.732	70.770	70.893	0.123	55.5	0.139	0.000	54.7	24.599	OK
AS4	FEH: 2 years: +0 %: 15 mins: Summer	72.096	70.326	70.467	0.141	74.5	0.159	0.000	72.5	33.218	OK
AS5	FEH: 2 years: +0 %: 15 mins: Summer	71.273	69.558	69.716	0.158	74.5	0.179	0.000	71.2	34.032	OK
AS6	FEH: 2 years: +0 %: 15 mins: Summer	70.903	68.888	69.022	0.134	108.7	0.192	0.000	107.8	51.303	OK
AS9	FEH: 2 years: +0 %: 15 mins: Summer	70.617	68.517	68.662	0.145	118.4	0.208	0.000	116.0	55.930	OK
AS10	FEH: 2 years: +0 %: 15 mins: Summer	69.939	67.983	68.135	0.152	120.4	0.218	0.000	117.1	57.854	OK
AS11	FEH: 2 years: +0 %: 15 mins: Summer	69.516	67.661	67.900	0.239	186.6	0.342	0.000	175.7	91.894	OK
AS17	FEH: 2 years: +0 %: 15 mins: Summer	68.784	67.450	67.668	0.218	195.4	0.385	0.000	190.0	100.498	OK
AS12	FEH: 2 years: +0 %: 15 mins: Summer	69.910	68.464	68.586	0.122	23.2	0.138	0.000	21.8	10.095	OK
AS13	FEH: 2 years: +0 %: 15 mins: Summer	70.252	68.227	68.380	0.153	30.4	0.173	0.000	29.6	13.827	OK
AS14	FEH: 2 years: +0 %: 15 mins: Summer	70.256	68.174	68.326	0.152	42.9	0.172	0.000	40.3	19.576	OK
AS15	FEH: 2 years: +0 %: 15 mins: Summer	69.889	67.964	68.087	0.123	41.9	0.139	0.000	41.0	20.254	OK
AS16	FEH: 2 years: +0 %: 15 mins: Summer	69.650	67.876	68.009	0.133	57.9	0.191	0.000	54.5	27.615	OK
AS7	FEH: 2 years: +0 %: 15 mins: Summer	71.489	69.849	69.954	0.104	17.1	0.118	0.000	16.4	7.448	OK
AS8	FEH: 2 years: +0 %: 15 mins: Summer	71.526	69.661	69.747	0.086	24.2	0.098	0.000	22.8	10.848	OK
BS1	FEH: 2 years: +0 %: 15 mins: Summer	69.946	68.596	68.632	0.036	3.5	0.041	0.000	3.3	1.517	OK
BS2	FEH: 2 years: +0 %: 15 mins: Summer	69.536	68.111	68.172	0.061	13.3	0.070	0.000	13.0	5.838	OK
BS3	FEH: 2 years: +0 %: 15 mins: Summer	69.174	67.749	67.824	0.075	32.7	0.085	0.000	32.3	14.424	OK
AS1	FEH: 2 years: +0 %: 15 mins: Summer	72.800	70.926	71.030	0.104	16.3	0.118	0.000	15.6	7.099	OK
AS3	FEH: 2 years: +0 %: 15 mins: Summer	73.187	71.313	71.390	0.077	23.6	0.087	0.000	23.1	10.251	OK
BS5	FEH: 2 years: +0 %: 15 mins: Summer	67.444	66.970	66.987	0.017	0.4	0.000	0.000	0.4	0.489	OK
AS19	FEH: 2 years: +0 %: 15 mins: Summer	67.615	67.100	67.130	0.030	1.9	0.000	0.000	1.9	1.721	OK
BS4	FEH: 2 years: +0 %: 15 mins: Summer	68.500	66.840	67.241	0.401	4.7	0.709	0.000	0.5	0.579	Surcharged
AS18	FEH: 2 years: +0 %: 15 mins: Summer	68.650	66.980	67.269	0.289	5.5	0.510	0.000	1.9	1.896	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Flooded Volume

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
AS2	FEH: 30 years: +35 %: 15 mins: Summer	72.732	70.770	71.360	0.590	136.4	0.667	0.000	130.4	68.210	Surcharged
AS4	FEH: 30 years: +35 %: 15 mins: Summer	72.096	70.326	71.034	0.708	185.4	0.801	0.000	176.0	92.070	Surcharged
AS5	FEH: 30 years: +35 %: 15 mins: Summer	71.273	69.558	70.113	0.555	181.4	0.628	0.000	176.8	94.502	Surcharged
AS6	FEH: 30 years: +35 %: 15 mins: Summer	70.903	68.888	69.126	0.238	280.5	0.341	0.000	278.6	142.384	OK
AS9	FEH: 30 years: +35 %: 15 mins: Summer	70.617	68.517	68.772	0.255	308.2	0.365	0.000	303.3	155.225	OK
AS10	FEH: 30 years: +35 %: 15 mins: Summer	69.939	67.983	68.285	0.302	315.8	0.431	0.000	312.1	160.579	OK
AS11	FEH: 30 years: +35 %: 15 mins: Summer	69.516	67.661	68.113	0.452	499.5	0.647	0.000	476.1	255.213	OK
AS17	FEH: 30 years: +35 %: 15 mins: Summer	68.784	67.450	67.836	0.386	530.6	0.682	0.000	519.5	279.039	OK
AS12	FEH: 30 years: +35 %: 15 mins: Summer	69.910	68.464	68.949	0.485	64.5	0.549	0.000	60.3	28.006	Surcharged
AS13	FEH: 30 years: +35 %: 15 mins: Summer	70.252	68.227	68.566	0.338	84.2	0.383	0.000	82.0	38.353	Surcharged
AS14	FEH: 30 years: +35 %: 15 mins: Summer	70.256	68.174	68.449	0.275	118.9	0.312	0.000	114.7	54.333	OK
AS15	FEH: 30 years: +35 %: 15 mins: Summer	69.889	67.964	68.200	0.236	119.1	0.267	0.000	116.4	56.230	OK
AS16	FEH: 30 years: +35 %: 15 mins: Summer	69.650	67.876	68.156	0.280	163.6	0.401	0.000	145.7	76.671	OK
AS7	FEH: 30 years: +35 %: 15 mins: Summer	71.489	69.849	70.084	0.235	47.5	0.265	0.000	43.8	20.617	Surcharged
AS8	FEH: 30 years: +35 %: 15 mins: Summer	71.526	69.661	69.827	0.166	65.6	0.188	0.000	62.7	30.079	OK
BS1	FEH: 30 years: +35 %: 15 mins: Summer	69.946	68.596	68.659	0.063	9.7	0.071	0.000	9.3	4.205	OK
BS2	FEH: 30 years: +35 %: 15 mins: Summer	69.536	68.111	68.223	0.112	36.9	0.127	0.000	36.3	16.173	OK
BS3	FEH: 30 years: +35 %: 15 mins: Summer	69.174	67.749	67.890	0.141	91.1	0.159	0.000	94.2	39.878	OK
AS1	FEH: 30 years: +35 %: 15 mins: Summer	72.800	70.926	71.455	0.530	45.4	0.599	0.000	35.7	19.692	Surcharged
AS3	FEH: 30 years: +35 %: 15 mins: Summer	73.187	71.313	71.468	0.156	65.4	0.176	0.000	54.4	28.390	OK

BS5	FEH: 30 years: +35 %: 15 mins: Summer	67.444	66.970	66.990	0.020	0.6	0.000	0.000	0.6	0.735	OK
AS19	FEH: 30 years: +35 %: 15 mins: Summer	67.615	67.100	67.130	0.030	1.9	0.000	0.000	1.9	2.182	OK
BS4	FEH: 30 years: +35 %: 15 mins: Summer	68.500	66.840	67.490	0.650	2.2	1.148	0.000	0.6	0.811	Surcharged
AS18	FEH: 30 years: +35 %: 15 mins: Summer	68.650	66.980	67.468	0.488	8.5	0.862	0.000	1.9	2.516	Surcharged

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flooded Volume

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
AS2	FEH: 100 years: +40 %: 15 mins: Summer	72.732	70.770	72.265	1.495	174.5	1.691	0.000	159.0	89.784	Surcharged
AS4	FEH: 100 years: +40 %: 15 mins: Summer	72.096	70.326	71.808	1.482	231.4	1.676	0.000	218.1	121.198	Flood Risk
AS5	FEH: 100 years: +40 %: 15 mins: Summer	71.273	69.558	70.466	0.908	225.2	1.027	0.000	219.1	124.415	Surcharged
AS6	FEH: 100 years: +40 %: 15 mins: Summer	70.903	68.888	69.164	0.276	350.2	0.395	0.000	347.0	187.465	OK
AS9	FEH: 100 years: +40 %: 15 mins: Summer	70.617	68.517	68.815	0.298	385.9	0.426	0.000	381.7	204.361	OK
AS10	FEH: 100 years: +40 %: 15 mins: Summer	69.939	67.983	68.336	0.353	398.0	0.505	0.000	390.4	211.416	OK
AS11	FEH: 100 years: +40 %: 15 mins: Summer	69.516	67.661	68.218	0.557	631.0	0.797	0.000	605.0	336.094	OK
AS17	FEH: 100 years: +40 %: 15 mins: Summer	68.784	67.450	67.904	0.454	676.7	0.803	0.000	665.7	366.612	OK
AS12	FEH: 100 years: +40 %: 15 mins: Summer	69.910	68.464	69.332	0.867	84.8	0.981	0.000	79.4	36.858	Surcharged
AS13	FEH: 100 years: +40 %: 15 mins: Summer	70.252	68.227	68.681	0.454	110.7	0.514	0.000	108.7	50.482	Surcharged
AS14	FEH: 100 years: +40 %: 15 mins: Summer	70.256	68.174	68.503	0.329	157.2	0.372	0.000	152.1	71.523	OK
AS15	FEH: 100 years: +40 %: 15 mins: Summer	69.889	67.964	68.276	0.312	157.9	0.353	0.000	151.8	74.027	OK
AS16	FEH: 100 years: +40 %: 15 mins: Summer	69.650	67.876	68.261	0.385	213.8	0.550	0.000	185.8	100.947	OK
AS7	FEH: 100 years: +40 %: 15 mins: Summer	71.489	69.849	70.331	0.482	62.4	0.545	0.000	57.8	27.124	Surcharged
AS8	FEH: 100 years: +40 %: 15 mins: Summer	71.526	69.661	69.914	0.253	86.5	0.287	0.000	77.1	39.613	Surcharged
BS1	FEH: 100 years: +40 %: 15 mins: Summer	69.946	68.596	68.670	0.074	12.7	0.083	0.000	12.3	5.534	OK
BS2	FEH: 100 years: +40 %: 15 mins: Summer	69.536	68.111	68.247	0.136	48.5	0.154	0.000	47.6	21.268	OK
BS3	FEH: 100 years: +40 %: 15 mins: Summer	69.174	67.749	67.939	0.190	119.6	0.215	0.000	109.5	52.498	OK
AS1	FEH: 100 years: +40 %: 15 mins: Summer	72.800	70.926	72.380	1.454	59.6	1.644	0.000	43.9	25.933	Surcharged
AS3	FEH: 100 years: +40 %: 15 mins: Summer	73.187	71.313	72.523	1.210	86.0	1.369	0.000	69.7	37.347	Surcharged

BS5	FEH: 100 years: +40 %: 15 mins: Summer	67.444	66.970	66.990	0.020	0.6	0.000	0.000	0.6	0.809	OK
AS19	FEH: 100 years: +40 %: 15 mins: Summer	67.615	67.100	67.131	0.031	1.9	0.000	0.000	1.9	2.375	OK
BS4	FEH: 100 years: +40 %: 15 mins: Summer	68.500	66.840	67.579	0.739	3.0	1.306	0.000	0.6	0.910	Surcharged
AS18	FEH: 100 years: +40 %: 15 mins: Summer	68.650	66.980	67.559	0.579	2.5	1.023	0.000	2.9	2.782	Surcharged

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 2 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. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Pond	FEH: 2 years: +0 %: 1440 mins: Winter	67.566	67.566	0.416	0.416	14.5	369.666	0.000	0.000	2.9	287.766	71.213	OK
Pond (1)	FEH: 2 years: +0 %: 480 mins: Winter	67.503	67.503	0.503	0.503	4.7	39.833	0.000	0.000	0.6	29.201	80.363	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +35: 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. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Pond	FEH: 30 years: +35 %: 1440 mins: Winter	68.110	68.110	0.960	0.960	34.1	971.895	0.000	0.000	3.0	430.063	24.315	OK
Pond (1)	FEH: 30 years: +35 %: 960 mins: Winter	67.922	67.922	0.922	0.922	6.8	118.703	0.000	0.000	0.8	78.050	41.480	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 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. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Pond	FEH: 100 years: +40 %: 1440 mins: Winter	68.376	68.376	1.226	1.226	44.6	1319.502	0.000	0.000	3.4	488.343	-2.755	Flood Risk
Pond (1)	FEH: 100 years: +40 %: 960 mins: Winter	68.093	68.093	1.093	1.093	9.0	167.162	0.000	0.000	0.9	85.677	17.591	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
AS1.001	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS2	AS4	72.732	70.897	0.136	27.567	1.8	0.33	57.7	OK
AS1.002	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS4	AS5	72.096	70.471	0.155	37.228	2.1	0.43	76.7	OK
AS1.003	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS5	AS6	71.273	69.722	0.156	38.144	2.0	0.49	75.4	OK
AS1.004	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS6	AS9	70.903	69.026	0.144	57.494	2.2	0.09	114.1	OK
AS1.005	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS9	AS10	70.617	68.667	0.154	62.673	2.1	0.12	122.9	OK
AS1.006	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS10	AS11	69.939	68.141	0.203	64.829	1.5	0.11	124.3	OK
AS1.007	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS11	AS17	69.516	67.909	0.237	102.983	1.8	0.29	187.6	OK
AS4.000	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS12	AS13	69.910	68.591	0.122	11.312	1.0	0.54	23.1	OK
AS4.001	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS13	AS14	70.252	68.385	0.158	15.488	0.8	0.44	31.3	OK
AS4.002	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS14	AS15	70.256	68.331	0.149	21.936	0.9	0.23	42.7	OK
AS4.003	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS15	AS16	69.889	68.091	0.133	22.698	0.9	0.08	43.5	OK
AS4.004	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS16	AS11	69.650	68.014	0.193	30.946	0.7	0.12	58.1	OK
AS3.000	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS7	AS8	71.489	69.957	0.098	8.336	1.0	0.42	17.3	OK
AS3.001	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS8	AS6	71.526	69.750	0.087	12.153	1.7	0.3	24.2	OK
BS1.000	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	BS1	BS2	69.946	68.633	0.036	1.697	1.1	0.13	3.5	OK
BS1.001	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	BS2	BS3	69.536	68.174	0.070	6.527	1.3	0.17	13.7	OK
AS1.000	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS1	AS2	72.800	71.033	0.103	7.959	0.9	0.41	16.5	OK
AS2.000	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS3	AS2	73.187	71.392	0.076	11.483	2.1	0.23	24.4	OK
BS1.004	FEH: 2 years: +0 %: 480 mins: Winter	Pipe	BS4	BS5	68.500	67.503	0.020	28.099	0.4	0.04	0.6	Surcharged

AS1.010	FEH: 2 years: +0 %: 120 mins: Summer	Pipe	AS18	AS19	68.650	67.382	0.040	31.427	0.8	0.14	2.9	Surcharged
BS1.002	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	BS3	Pond (1)	69.174	67.826	0.142	16.141	1.7	0.25	34.1	OK
BS1.003	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	Pond (1)	BS4	67.000	67.241	0.225	1.372	0.1	0.05	4.7	Surcharged
AS1.009	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	Pond	AS18	67.150	67.269	0.204	2.496	0.1	0.03	5.5	OK
AS1.008	FEH: 2 years: +0 %: 15 mins: Winter	Pipe	AS17	Pond	68.784	67.676	0.159	112.626	3.4	0.24	203.1	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
AS1.001	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS2	AS4	72.732	71.503	0.300	76.403	1.9	0.76	133.5	Surcharged
AS1.002	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS4	AS5	72.096	71.156	0.300	103.146	2.6	1.04	182.9	Surcharged
AS1.003	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS5	AS6	71.273	70.176	0.300	105.864	2.6	1.2	185.2	Surcharged
AS1.004	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS6	AS9	70.903	69.134	0.255	159.519	2.6	0.24	292.6	OK
AS1.005	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS9	AS10	70.617	68.781	0.287	173.899	2.4	0.31	318.7	OK
AS1.006	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS10	AS11	69.939	68.293	0.391	179.899	1.7	0.29	325.4	OK
AS1.007	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS11	AS17	69.516	68.132	0.436	285.955	2.3	0.78	504.5	OK
AS4.000	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS12	AS13	69.910	69.021	0.225	31.372	1.6	1.51	63.9	Surcharged
AS4.001	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS13	AS14	70.252	68.585	0.300	42.963	1.2	1.22	87.4	Surcharged
AS4.002	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS14	AS15	70.256	68.459	0.264	60.870	1.3	0.65	121.4	OK
AS4.003	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS15	AS16	69.889	68.213	0.274	62.997	1.0	0.22	122.9	OK
AS4.004	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS16	AS11	69.650	68.175	0.385	85.891	0.8	0.32	155.5	OK
AS3.000	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS7	AS8	71.489	70.114	0.220	23.106	1.2	1.14	46.8	Surcharged
AS3.001	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS8	AS6	71.526	69.835	0.165	33.708	2.1	0.83	66.1	OK

BS1.000	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	BS1	BS2	69.946	68.660	0.063	4.710	1.4	0.35	9.8	OK
BS1.001	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	BS2	BS3	69.536	68.227	0.129	18.115	1.6	0.46	38.3	OK
AS1.000	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS1	AS2	72.800	71.588	0.225	22.061	1.0	0.96	38.7	Surch arged
AS2.000	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS3	AS2	73.187	71.698	0.225	31.806	2.0	0.53	56.3	Surch arged
BS1.004	FEH: 30 years: +35 %: 960 mins: Winter	Pipe	BS4	BS5	68.500	67.922	0.023	76.302	0.4	0.05	0.8	Surch arged
AS1.010	FEH: 30 years: +35 %: 1440 mins: Winter	Pipe	AS18	AS19	68.650	68.110	0.040	428.093	0.8	0.14	3.0	Surch arged
BS1.002	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	BS3	Pond (1)	69.174	67.890	0.225	44.678	2.4	0.7	94.9	OK
BS1.003	FEH: 30 years: +35 %: 60 mins: Winter	Pipe	Pond (1)	BS4	67.000	67.690	0.225	5.695	0.4	0.06	4.9	Surch arged
AS1.009	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	Pond	AS18	67.150	67.503	0.300	3.497	0.7	0.16	30.0	Surch arged
AS1.008	FEH: 30 years: +35 %: 15 mins: Winter	Pipe	AS17	Pond	68.784	67.851	0.298	312.304	4.2	0.66	552.5	OK

Project:	Date: 09/10/2023		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		

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

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
AS1.001	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS2	AS4	72.732	72.540	0.300	100.538	2.4	0.95	168.0	Flood Risk
AS1.002	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS4	AS5	72.096	72.041	0.300	135.628	3.3	1.31	230.3	Flood Risk
AS1.003	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS5	AS6	71.273	70.571	0.300	139.204	3.3	1.5	231.3	Surcharged
AS1.004	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS6	AS9	70.903	69.175	0.298	209.826	2.6	0.3	365.7	OK
AS1.005	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS9	AS10	70.617	68.825	0.337	228.755	2.4	0.39	399.0	OK
AS1.006	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS10	AS11	69.939	68.350	0.480	236.648	1.7	0.36	406.9	OK
AS1.007	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS11	AS17	69.516	68.255	0.531	376.284	2.4	0.96	624.8	OK
AS4.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS12	AS13	69.910	69.427	0.225	41.288	2.1	1.97	83.6	Surcharged
AS4.001	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS13	AS14	70.252	68.713	0.300	56.544	1.6	1.6	114.6	Surcharged
AS4.002	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS14	AS15	70.256	68.515	0.311	79.878	1.4	0.86	160.6	OK
AS4.003	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS15	AS16	69.889	68.312	0.385	82.849	0.9	0.28	157.1	OK
AS4.004	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS16	AS11	69.650	68.297	0.507	113.023	0.8	0.39	187.9	OK
AS3.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS7	AS8	71.489	70.437	0.225	30.385	1.5	1.42	58.3	Surcharged
AS3.001	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS8	AS6	71.526	70.007	0.225	44.371	2.0	1.02	81.3	Surcharged

BS1.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	BS1	BS2	69.946	68.672	0.074	6.182	1.5	0.47	13.0	OK
BS1.001	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	BS2	BS3	69.536	68.241	0.225	23.815	1.4	0.61	51.0	OK
AS1.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS1	AS2	72.800	72.664	0.225	29.030	1.2	1.15	46.5	Flood Risk
AS2.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS3	AS2	73.187	72.819	0.225	41.828	2.1	0.7	73.5	Surch arged
BS1.004	FEH: 100 years: +40 %: 960 mins: Winter	Pipe	BS4	BS5	68.500	68.093	0.025	83.577	0.5	0.06	0.9	Surch arged
AS1.010	FEH: 100 years: +40 %: 1440 mins: Winter	Pipe	AS18	AS19	68.650	68.376	0.042	485.905	0.8	0.16	3.4	Flood Risk
BS1.002	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	BS3	Pond (1)	69.174	68.129	0.225	58.799	2.9	0.84	113.5	Surch arged
BS1.003	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	Pond (1)	BS4	67.000	67.619	0.225	2.402	1.0	0.11	9.4	Surch arged
AS1.009	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	Pond	AS18	67.150	67.603	0.300	3.939	0.1	0.03	6.2	Surch arged
AS1.008	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	AS17	Pond	68.784	67.917	0.380	409.831	4.3	0.83	695.7	OK

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 700 Urban 0.000
Area (ha) 3.859 Soil 0.300 Region Number Region 4

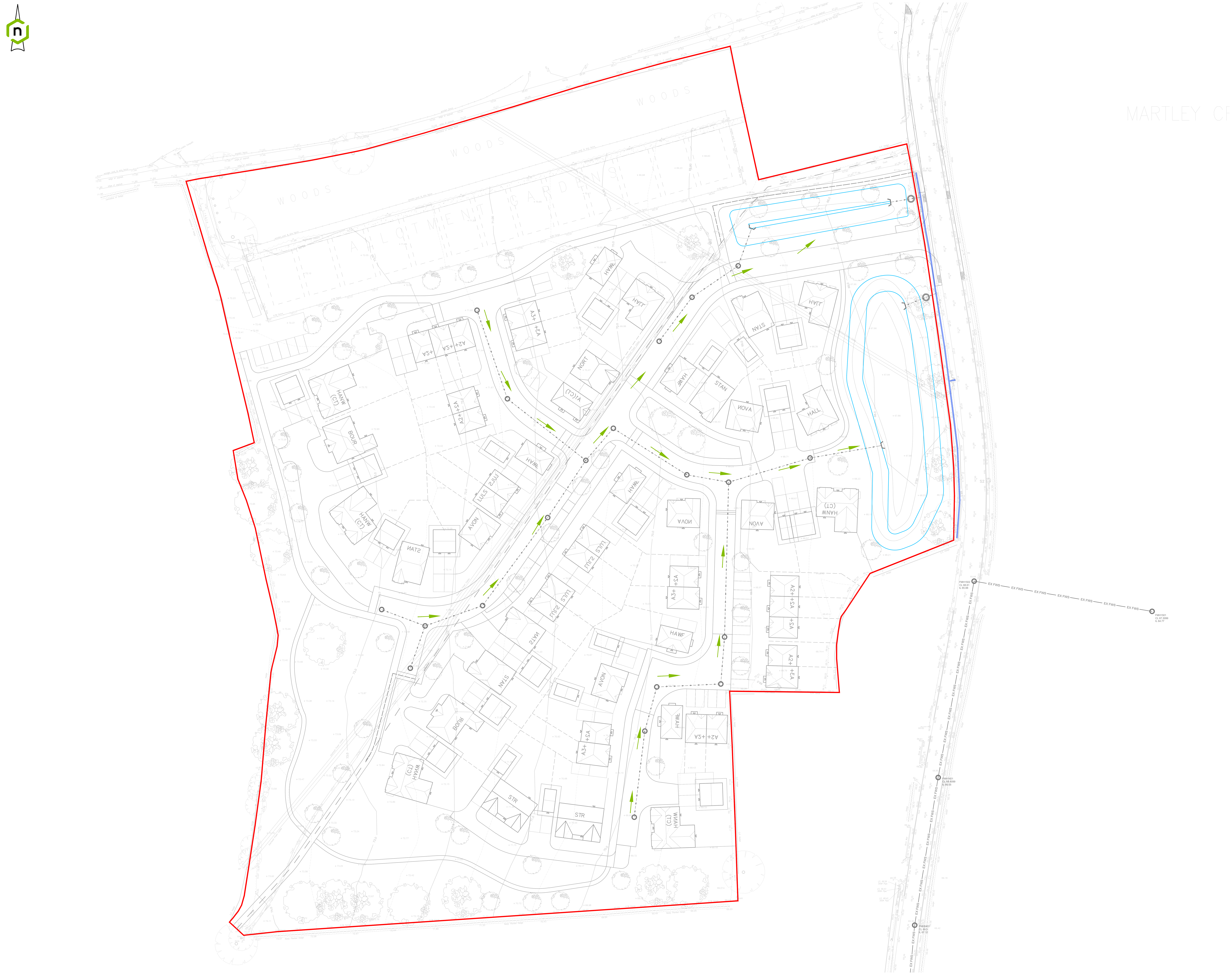
Results l/s

QBAR Rural 7.0
QBAR Urban 7.0

Q100 years 18.1

Q1 year 5.8
Q30 years 13.8
Q100 years 18.1

APPENDIX C – Exceedance Flow Plan



GENERAL NOTES

1. THIS DRAWING SHOULD NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF LINK ENGINEERING.
2. DO NOT SCALE FROM THIS DRAWING. UNITS ARE IN METRES UNLESS OTHERWISE SPECIFIED.
3. THE CONTRACTOR IS TO CHECK ALL INFORMATION PROVIDED PRIOR TO COMMENCING WORKS AND SEEK CLARIFICATION FROM THE ENGINEER IN RESPECT TO ANY AMBIGUITIES FOUND.
4. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER SCHEME SPECIFIC DRAWINGS.
5. PAVEMENT SURFACING AND FOUNDATIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE DEPARTMENT FOR TRANSPORT'S DESIGN MANUAL FOR ROADS AND BRIDGES AND SHALL COMPLY WITH THE ADOPTING LOCAL HIGHWAY AUTHORITY'S DESIGN GUIDANCES WHERE APPLICABLE, FOLLOWING A FULL SITE INVESTIGATION TO ESTABLISH GROUND CONDITIONS.
6. ALL TRAFFIC SIGNS AND ROAD MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH THE TRAFFIC SIGNS REGULATIONS AND GENERAL DIRECTIONS 2016 (INCLUDING SUBSEQUENT AMENDMENTS 1 & 2) AND THE CORRESPONDING TRAFFIC SIGNS MANUALS
7. ALL ADOPTABLE STREETLIGHTING SHALL BE DESIGNED IN ACCORDANCE WITH THE ADOPTING LOCAL HIGHWAY AUTHORITY'S DESIGN GUIDANCES WHERE APPLICABLE. LIGHTING SHALL BE DESIGNED TO BS 5489 (2013) AND BS EN 13201 (2015) FOR THE APPROPRIATE ROUTE CLASSIFICATION.
8. ALL ADOPTABLE HIGHWAY WORKS SHALL BE ADOPTED VIA THE HIGHWAY AUTHORITY ACT 1980.
9. FOUL AND SURFACE WATER DRAINAGE STRATEGIES SHALL BE DESIGNED IN STRICT ACCORDANCE WITH THE SITE SPECIFIC FLOOD RISK ASSESSMENT RECOMMENDATIONS.
10. ALL ADOPTABLE DRAINAGE WORKS SHALL BE DESIGNED IN ACCORDANCE WITH "SEWERS FOR ADOPTION" 6th EDITION, THE "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY" 6th EDITION AND ANY SUBSEQUENT AMENDMENTS TO THESE DOCUMENTS AS ADVISED.
11. ALL ADOPTABLE DRAINAGE WORKS SHALL BE ADOPTED VIA THE WATER INDUSTRY ACT 1991.
12. ALL PRIVATE WORKS SHALL BE DESIGNED TO THEIR RESPECTIVE PARTS OF BUILDING REGULATIONS.
13. FOR FINAL DEVELOPMENT LAYOUT AND LANDSCAPING PROPOSALS, SEE ARCHITECTS PLANS.
14. PLANTING OR ANY OBSTRUCTIONS OF ANY KIND (OTHER THAN ESSENTIAL STREET FURNITURE) ARE PERMITTED WITHIN THE CARRIAGEWAY VISIBILITY SPLAYS.
15. ALL EARTHWORK SLOPES TO BE A MINIMUM 1 IN 3 OR UNLESS ADVISED OTHERWISE WITHIN SPECIFIC SITE INVESTIGATION DESIGN REPORT TO BE PROVIDED.
16. ALL SIGNAGE TO BE IN ACCORDANCE WITH TSRGD.

KEY

PROPOSED STORM MANHOLE
PROPOSED STORM SEWER
HW2 PROPOSED HEADWALL
EXISTING SURFACE WATER DITCH
DIRECTION OF FLOOD EXCEEDANCE ROUTES

Rev.	Amendments	Date	By
-	INITIAL ISSUE.	07.03.24	WJT

Revisions

Client
HAYFIELD

Link ENGINEERING
Find us @ www.linkeng.co.uk

Project
LE23827
BERROW GREEN
MARTLEY

Drawing
EXCEEDANCE FLOW PLAN

Scale @ A1	Drawn	Checked	Rev
1:500	WJT	FJ	-

DWG No
BGM-LE-GEN-XX-DR-CE-002

Status
PLANNING (S5)