

Appendix H – Outline Drainage Strategy



Outline Application
Permitted development
for 120 dwellings
(Ref: DC/24/0428)

Basin 1
Bottom area: 150.5m²
Top area: 734.5m²
Depth of storage: 2m
Freeboard: 0.3m
Banks: 1 in 3
Total volume: 885m³

Basin 2
Bottom area: 51.1m²
Top area: 126.5m²
Depth of storage: 0.75m
Freeboard: 0.3m
Banks: 1 in 3
Attenuation volume: 66.6m³

Proposed outfall to
watercourse @ 10.4mAOD
at maximum rate 17.1l/s
via Hydrobrake or similar
flow control.

- KEY**
- Attenuation Basin
 - Permeable Paving
 - Indicative Foul Water Rising Main
 - Indicative Surface Water Drainage Route

- NOTES**
- This drawing represents an Outline Drainage Strategy which seeks to establish the principles of surface water management for the proposed development.
 - Drawing is based on Proving Layout prepared by FPCR (dwg ref. 13658-FCPR-ZZ-ZZ-DR-L-0005 P04. It should be noted that the proposed site layout is indicative only and will be fixed at the Reserved Matters stage.
 - Location, dimensions and storage volumes provided by proposed SuDS features to be confirmed at the detailed design stage taking into account proposed site levels.
 - Discharge rates from respective catchments to be restricted to corresponding QBAR runoff rates during all events up to and including the 1 in 100 year plus 45% climate change event.
 - Surface water runoff to discharge to existing Ordinary Watercourse adjacent to southern boundary, subject to agreement with LLFA. Ordinary Watercourse consent will be required for any new outfall into the respective watercourses.
 - Foul effluent to discharge to existing public sewer network via a pumped connection, subject to agreement with Southern Water.

Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information. Subject to detailed design.



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Client: Wain Estates (Land) Ltd			
Site: Land at Shermanbury Road			
Title: Outline Drainage Strategy			
Job No.: FRA251234	Scale (See Scale Bar): NTS	App: DP	Revision: H 0
Drawn By: DP	Checked By: CC	Drawn: July 2026	



- KEY**
- Attenuation Basin
 - Permeable Paving
 - Indicative Foul Water Rising Main
 - Existing Public Foul Sewer
 - Indicative Surface Water Drainage Route
- NOTES**
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Client:

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Land at Shermanbury Road

Title:

Outline Drainage Strategy

Job No:	Scale (See Scale Bar):	App:	Revision:
FRA251234	NTS		
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DP	CC	July 2026	H 0

Appendix I – Causeway Flow Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Pervious Drives	0.869	5.00	14.000		519808.730	119518.147	0.900
Basin 1	0.451	5.00	13.500	1200	519808.347	119509.784	2.000
S1			13.500	1800	519802.025	119509.870	2.026
S2			13.600	1200	519749.628	119510.513	2.340
S3	0.030	5.00	13.500	1200	519745.988	119498.151	2.293
S4	0.024	5.00	12.400	1200	519745.791	119475.956	1.284
S5			11.700	1200	519761.515	119446.007	0.900
Basin 2		5.00	11.500		519767.619	119446.661	0.750
S6			11.400	1800	519764.612	119440.069	0.900
Outfall			11.400		519766.087	119437.242	1.000

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	45	0	0

Node S1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	11.474	Product Number	CTL-SHE-0169-1670-2000-1670
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	16.7	Min Node Diameter (mm)	1800

Node Pervious Drives Online Orifice Control

Flap Valve	x	Design Depth (m)	1.200	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	120.0		
Invert Level (m)	13.100	Diameter (m)	0.235		

Node S6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	10.500	Product Number	CTL-SHE-0187-1710-0900-1710
Design Depth (m)	0.900	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	17.1	Min Node Diameter (mm)	1500

Node Basin 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	11.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	808

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	150.5	150.5	2.000	734.5	750.9

Node Pervious Drives Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	13.100	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	90	Depth (m)	0.450
Safety Factor	2.0	Width (m)	60.000	Inf Depth (m)	
Porosity	0.30	Length (m)	65.000		

Node Basin 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	10.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	440

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	51.1	51.1	0.750	126.5	130.4

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Pervious Drives	152	13.255	0.155	56.5	107.8168	0.0000	OK
360 minute summer	Basin 1	288	12.005	0.505	36.8	116.1617	0.0000	SURCHARGED
360 minute summer	S1	288	12.002	0.528	16.4	1.3449	0.0000	SURCHARGED
360 minute summer	S2	288	11.365	0.105	16.4	0.1183	0.0000	OK
240 minute summer	S3	140	11.309	0.102	16.7	0.1417	0.0000	OK
120 minute summer	S4	66	11.206	0.090	18.3	0.1350	0.0000	OK
120 minute summer	S5	68	10.856	0.056	18.2	0.0634	0.0000	OK
360 minute summer	Basin 2	280	10.791	0.041	0.8	2.1821	0.0000	OK
360 minute summer	S6	280	10.791	0.291	17.5	0.7407	0.0000	OK
360 minute summer	Outfall	280	10.459	0.059	16.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Pervious Drives	1.000	Basin 1	19.2	2.197	0.070	0.0732	
360 minute summer	Basin 1	1.001	S1	16.4	0.233	0.231	0.4453	
360 minute summer	S1	1.002	S2	16.4	0.783	0.232	1.0988	
360 minute summer	S2	1.003	S3	16.4	0.770	0.231	0.2754	
240 minute summer	S3	1.004	S4	16.7	0.887	0.236	0.4262	
120 minute summer	S4	1.005	S5	18.2	1.381	0.170	0.4521	
120 minute summer	S5	1.006	S6	18.2	0.645	0.077	0.2548	
360 minute summer	Basin 2	2.000	S6	-0.8	-0.121	-0.040	0.0764	
360 minute summer	S6	1.007	Outfall	16.8	1.626	0.085	0.0329	384.7

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Pervious Drives	84	13.446	0.346	260.8	335.6304	0.0000	SURCHARGED
480 minute summer	Basin 1	496	13.163	1.663	92.0	663.1965	0.0000	SURCHARGED
480 minute summer	S1	496	13.160	1.686	17.1	4.2915	0.0000	SURCHARGED
30 minute summer	S2	19	11.373	0.113	16.7	0.1277	0.0000	OK
15 minute summer	S3	11	11.360	0.153	33.4	0.2137	0.0000	OK
15 minute summer	S4	11	11.262	0.146	48.1	0.2191	0.0000	OK
240 minute summer	S5	168	11.053	0.253	26.7	0.2862	0.0000	OK
240 minute summer	Basin 2	172	11.051	0.301	11.6	19.9290	0.0000	SURCHARGED
240 minute summer	S6	168	11.051	0.551	26.4	1.4019	0.0000	SURCHARGED
1440 minute winter	Outfall	960	10.459	0.059	17.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	Pervious Drives	1.000	Basin 1	55.1	2.916	0.202	0.3368	
480 minute summer	Basin 1	1.001	S1	17.1	0.291	0.242	0.4453	
480 minute summer	S1	1.002	S2	16.7	0.787	0.236	1.1196	
30 minute summer	S2	1.003	S3	16.9	0.776	0.238	0.3843	
15 minute summer	S3	1.004	S4	33.1	0.983	0.468	0.7783	
15 minute summer	S4	1.005	S5	48.1	1.620	0.448	1.5036	
240 minute summer	S5	1.006	S6	26.4	0.786	0.112	0.4481	
240 minute summer	Basin 2	2.000	S6	-11.6	-0.659	-0.555	0.1275	
240 minute summer	S6	1.007	Outfall	17.1	1.633	0.086	0.0334	988.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Pervious Drives	86	13.537	0.437	338.1	443.9983	0.0000	SURCHARGED
360 minute summer	Basin 1	360	13.366	1.866	132.2	799.5639	0.0000	FLOOD RISK
360 minute summer	S1	360	13.363	1.889	17.2	4.8079	0.0000	FLOOD RISK
15 minute summer	S2	11	11.388	0.128	16.7	0.1446	0.0000	OK
15 minute summer	S3	11	11.379	0.172	40.2	0.2393	0.0000	OK
15 minute summer	S4	12	11.279	0.163	59.7	0.2450	0.0000	OK
480 minute summer	S5	768	11.268	0.468	24.0	0.5290	0.0000	SURCHARGED
480 minute summer	Basin 2	768	11.265	0.515	6.5	39.6755	0.0000	FLOOD RISK
480 minute summer	S6	768	11.265	0.765	42.3	1.9476	0.0000	FLOOD RISK
960 minute winter	Outfall	495	10.459	0.059	17.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	Pervious Drives	1.000	Basin 1	65.2	3.041	0.239	0.4120	
360 minute summer	Basin 1	1.001	S1	17.2	0.283	0.243	0.4453	
360 minute summer	S1	1.002	S2	16.7	0.787	0.236	1.1215	
15 minute summer	S2	1.003	S3	17.9	0.776	0.253	0.4533	
15 minute summer	S3	1.004	S4	40.1	1.011	0.567	0.8820	
15 minute summer	S4	1.005	S5	59.9	1.606	0.558	1.8513	
480 minute summer	S5	1.006	S6	42.3	0.758	0.179	0.4716	
480 minute summer	Basin 2	2.000	S6	-6.5	-0.371	-0.313	0.1275	
480 minute summer	S6	1.007	Outfall	17.1	1.634	0.087	0.0334	1484.5

Appendix J - References

ⁱ Ministry of Housing, Communities and Local Government, December 2024, “National Planning Policy Framework”.

ⁱⁱ Ministry of Housing Communities and Local Government. “Planning Practice Guidance” Ministry of Housing, Communities and Local Government, February 2024, “Planning practice guidance”.

ⁱⁱⁱ Horsham District Council, Scott Wilson, April 2010 Strategic Flood Risk Assessment

Based across the UK with
offices in Manchester, Liverpool,
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