

Project Title: Priors & Pearce's Farm

Project No/ Document Reference: A218-R061

Date: 07 May 2026

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RESPONSE TO LLFA DRAINAGE COMMENTS ON FRA

1. Introduction

- 1.1. 1.1 This Technical Note has been prepared by Abley Letchford to accompany the revised drainage catchment strategy drawing and supporting hydraulic calculations prepared in response to comments received from Wokingham Borough Council in respect of planning application 241933. For clarity this note relates to planning applications 241933 (Priors Farm) and 242279 (Pearces Farm).
- 1.2. The application relates to land west of Old Wokingham Road and north and south of Easthampstead Road, Wokingham, comprising the proposed South Wokingham SDL Extension. The proposal is a hybrid application comprising outline development for up to 850 dwellings, including a neighbourhood centre, public open space, play areas, allotments, drainage and associated infrastructure, together with a full application for the proposed SANG and associated works.
- 1.3. This note should be read alongside the previously submitted Flood Risk Assessments and Drainage Strategies for Priors Farm and Pearces Farm, together with the subsequent FRA and Drainage Strategy Addendum prepared for the wider Priors / Pearces Farm drainage strategy.

2. Purpose of this Technical Note

- The purpose of this Technical Note is to:
- respond to the drainage matters raised by Wokingham Borough Council in its LLFA consultation response;
- confirm the basis of the revised site-wide drainage catchment strategy shown on drawing A218-025 P7;
- summarise the updated greenfield runoff assessment and hydraulic calculations;
- confirm that the drainage strategy remains an outline strategy, with detailed catchment boundaries, basin geometry, outfall details, flow controls and conveyance features to be developed further at Reserved Matters / detailed design stage;
- demonstrate that the outline drainage principles remain technically appropriate and capable of being developed into a compliant SuDS scheme at reserved matters; and
- Demonstrate that the drainage system will continue to operate as intended during such periods where the downstream river is flooding. This will apply to the 1%AEP with a 14% allowance for climate change

3. Background to LLFA Comments

- 3.1. The LLFA confirmed that the general principle of subdividing the site into discrete catchments, each served by attenuation storage and controlled outfalls to the ordinary watercourse network, was accepted in principle. However, the LLFA raised a number of matters requiring clarification or further information.
- 3.2. The key matters raised by the LLFA were as follows:





- outfall viability should be confirmed rather than assumed, with survey evidence of receiving watercourse invert levels, bank levels and cross-sectional capacity;
- confirmation is required that basin outfall invert levels are appropriately related to the 1 in 100 year plus 14% climate change fluvial flood level, particularly where basins are located close to the Flood Zone 2 / 3 corridor. Please refer to paragraph 7.2
- catchment boundaries shown on the outline drawing are indicative and will need to be updated as the detailed layout evolves;
- individual sub-catchment discharge rates will need to be checked at detailed design stage, particularly where rates may fall below the minimum practical discharge rate;
- distributed source control storage relied upon within the strategy should be spatially located at Reserved Matters stage;
- swales and filter drains should be supported by sizing calculations at detailed design stage;
- flow controls should be individually sized for each basin based on the confirmed contributing catchment area and discharge rate;
- basin cross-sections and volume / depth curves should be provided at Reserved Matters stage to confirm that the required storage volumes can be achieved within the available footprints; and
- groundwater monitoring information should be provided to confirm basin liner requirements.

3.3. The revised drawing and calculations submitted with this Technical Note have therefore been prepared to provide additional clarity at outline stage and to demonstrate that the drainage strategy remains deliverable, subject to the normal refinement expected through Reserved Matters and detailed design.

4. Revised Site-Wide Drainage Catchment Strategy

- 4.1. The revised site-wide drainage catchment strategy is shown on drawing A218-025 P7, titled "Site Wide Drainage Catchment Strategy", dated May 2026.
- 4.2. Revision P7 notes that the flow route and catchments have been amended to suit basin updates. The drawing continues to show the application boundary, proposed developable area, drainage catchment areas, proposed attenuation basins, basin outfalls, swale / filter drain corridors, natural overland flow routes and the Flood Zone 100 year plus 14% climate change extent.
- 4.3. The drawing identifies the following drainage features:
- attenuation basins labelled Basin 1 to Basin 8;
 - drainage catchments labelled Catchment 1 to Catchment 4 and Catchment Pearce 1 / Catchment Pearce 2;
 - 2 m wide swale / filter drain corridors;
 - 3 m to 5 m wide swale / filter drain corridors; and
 - basin outfall locations.
- 4.4. The revised drawing remains an outline drainage strategy drawing and notes that the surface water strategy is indicative and based on masterplanning information at the time of production. It also notes that all surface water calculations were undertaken using Causeway Flow drainage software and are subject to detailed design.



5. Greenfield Runoff Rates

- 5.1. The greenfield runoff rates have been reviewed using the HR Wallingford / UK SuDS greenfield runoff rate estimation tool. The calculation output confirms that the assessment was undertaken for Priors & Pearce's Farm, Wokingham, using the FEH statistical 2025 method.
- 5.2. The calculation output identifies the following key parameters:

Parameter	Value
Site name	Priors & Pearce's Farm
Site location	Wokingham
Easting	483318
Northing	167417
Model version	2.2.3
Method	FEH statistical 2025
SAAR9120	691 mm
BFIHOST19 scaled	0.389
QMED-QBAR conversion	1.136
Hydrological Region	6

- 5.3. The resulting greenfield runoff rates are:

Return Period	Flow Rate
1 year	3.6 l/s
2 year	3.7 l/s
10 year	6.8 l/s
30 year	9.7 l/s
100 year	13.4 l/s
200 year	15.7 l/s

- 5.4. The hydraulic calculations submitted alongside this note use a positively drained area of 1.000 ha and identify Q2, Q30 and Q100 rates of 3.8 l/s, 10.0 l/s and 13.9 l/s respectively. These values are consistent with the outline approach of assessing discharge and storage on a unit-area basis for subsequent application to the site catchments at detailed design stage.
- 5.5. The LLFA previously noted that the FEH statistical approach had been correctly applied and accepted the parameters as the basis for the outline drainage strategy. The LLFA also noted that detailed design submissions should check individual sub-catchment QBAR rates and apply the minimum discharge rate where necessary.

6. Hydraulic Modelling and Storage Assessment

- 6.1. The supporting hydraulic calculations have been prepared using Causeway Flow+ version 17.0 and are titled "A218 - Prior's Farm Outline Design".
- 6.2. The hydraulic model uses FEH-22 rainfall methodology and assesses the 1 year, 30 year and 100 year plus 40% climate change events. The calculations include a check against discharge rates of 3.8 l/s for the 2 year event, 10.0 l/s for the 30 year event and 13.9 l/s for the 100 year event.
- 6.3. The calculations identify a 100 year 360 minute pre-development runoff volume of 328 m³ for the 1.000 ha positively drained area.



- 6.4. Permeable runoff has been calculated using a ReFH2 dynamic hydrograph to represent the greenfield runoff scenario for the site over a range of storms.
- 6.5. Two storage structures are represented in the hydraulic output:
- a Long Term Storage node, modelled with a 500 m² depth / area storage structure and a 1.000 m depth; and
 - a QBAR storage node, modelled with a 650 m² depth / area storage structure and a 1.500 m depth.
- 6.6. The hydraulic results show no flooding for the critical 1 year, 30 year and 100 year plus 40% climate change events. The 100 year plus 40% climate change critical storm results show zero flood volume at both the QBAR and LTS nodes.
- 6.7. For the 100 year plus 40% climate change event, the critical results include:

Node	Critical Event	Peak Depth	Node Volume	Flood Volume	Status
QBAR	600 minute winter	1.451 m	943.4491 m ³	0.0000 m ³	OK
LTS	360 minute summer	1.249 m	624.7268 m ³	0.0000 m ³	OK

- 6.8. The results therefore demonstrate that, on the outline unit-rate modelling basis, sufficient storage can be provided to manage the critical storm events without flooding from the modelled attenuation nodes.

7. Response to LLFA Matters

Outfall Viability

- 7.1. The LLFA requested that outfall viability be formally confirmed through survey information, including receiving watercourse invert levels, bank levels and cross-sectional capacity.
- 7.2. The revised drainage strategy drawing identifies proposed basin outfall locations, drainage corridors and existing watercourse information, providing a clearer spatial framework for how each catchment will discharge from the site.

Relationship with Flood Zone and Fluvial Levels

- 7.3. The LLFA requested confirmation that basin outfall invert levels are appropriately related to the 1 in 100 year plus 14% climate change fluvial flood level in the receiving watercourse.
- 7.4. The revised drawing shows the Flood Zone 100 year plus 14% climate change extent in relation to the proposed drainage catchments, attenuation basins and outfalls. Furthermore, the drawing shows the anticipated outfall location and the modelled flood level at these locations within the table. The basins have been raised to ensure their base is above the flood level at these locations. It is, however, this point that conflicts with other elements of WBC objectives as well as providing a scheme that may not be aesthetically pleasing and/or require extensive earthworks. We therefore request WBC to reconsider this request.
- 7.5. Abley Letchford appreciates the drainage need to raise basin levels above any flood level but this contradicts with WBC landscape objectives of having SuDS features that are in keeping with the existing landform and not overly engineered. The definition of a flood level is that it is at ground level. In the case of Priors Farm this



is related to the Liden Brook tributary running through the site which is a large floodplain corridor, 10m to 40m wide albeit the actual ditch is only small, less than 3m wide. The floodplain and ditch has been fully respected.

- 7.6. The SuDS basins and swales that sit alongside this corridor have been designed to form a large blue/green corridor in keeping with the desire to respect the existing landform, where the basins are able to be used for recreation when not in flood. They are multilayered to cater for the 1 in 10, 1 in 30 and 1 in 100 year plus climate change in different levels and therefore mostly dry apart from in extreme flood events.
- 7.7. To raise the whole basins out of the ground above the 1 in 100 year plus 14% climate change appears to contradict the aims of the landscape officer and the masterplan as a whole. No longer will these areas be able to be used as recreation and will be unusable voids for most of the time. Furthermore, the surrounding land will need to be extensively raised to achieve pipe cover creating huge earthworks movements and creating a landform that does not respect the existing constraints, such as trees and vegetation, or the gentle slopes of the development.
- 7.8. We appreciate the need to ensure the drainage scheme works in all storms but we request the outfalls are above another datum, such as the 1 in 10 year flood event or top of bank, with sensitivity testing undertaken on a surcharged outfall for the storms in excess of this up to the 1 in 100 year flood event plus 14% climate change. This means the basins will work as intended for the majority of storms throughout the year but for the most extreme events the basins will maintain the flood levels and act as storage the same as they would if raised out of the ground. This is easily achieved with a non-return valve within the system which is normal construction and flood modelling detailing.
- 7.9. Notwithstanding the above to clarify, at outline stage, the strategy remains based on providing attenuation storage outside the main developable areas, with controlled discharges to the receiving drainage network. Final outfall levels, headwall arrangements, non-return protection where required, and any interaction with fluvial flood levels will be confirmed through detailed design.

Catchment Boundary Clarity

- 7.10. The LLFA noted that catchment boundaries shown on the drainage strategy drawing are indicative and based on masterplanning information.
- 7.11. The revised drawing provides updated drainage catchments and identifies the revised basin arrangement, with the drawing revision noting that the flow route and catchments have been amended to suit basin updates.
- 7.12. As the application remains at outline stage, the catchment boundaries should be treated as strategic drainage catchments. The final boundaries will be updated at Reserved Matters stage to reflect final highway layouts, parcel boundaries, finished levels, source control features, swale and filter drain alignments, impermeable area calculations and the final phasing of development. However, to clarify it is not considered this will be much of a change if any.

Distributed Source Control Storage

- 7.13. The LLFA identified that some catchments rely on distributed source control storage and requested that this be spatially allocated at Reserved Matters stage.



- 7.14. The revised strategy drawing identifies swale / filter drain corridors and basin connections across the site, including 2 m wide and 3 m to 5 m wide swale / filter drain corridors. These features provide the framework for distributed conveyance, water quality treatment and, where appropriate, local attenuation within the catchments.
- 7.15. The detailed drainage design should confirm the specific form, extent and storage contribution of source control features, which may include swales, filter drains, rain gardens, permeable paving, local attenuation and other SuDS features appropriate to the final layout. The final detailed design should also demonstrate how the residual storage requirement within each catchment is physically provided. This can be assured through an appropriately worded condition.

Swales and Filter Drains

- 7.16. The LLFA requested swale cross-section designs and capacity calculations demonstrating conveyance capacity at detailed design stage.
- 7.17. The revised drawing identifies the proposed swale / filter drain corridors forming part of the outline surface water drainage strategy. The detailed sizing of these features will depend on final contributing catchment areas, longitudinal gradients, side slopes, treatment requirements, highway design and landscape constraints.
- 7.18. It is therefore proposed that detailed swale and filter drain calculations are provided at Reserved Matters stage, once the final layout and levels are fixed. These calculations should confirm conveyance capacity, treatment function, exceedance routing and maintenance access. This can be assured through an appropriately worded condition.

Flow Controls

- 7.19. The LLFA noted that the hydraulic calculations include indicative Hydro-Brake® product references and that each basin will require individual flow control sizing at detailed design stage.
- 7.20. The supporting hydraulic calculations include Hydro-Brake® controls within the outline model. These controls are appropriate for testing the principle of restricted discharge and associated storage requirements at outline stage. However, final flow control selection will be undertaken for each basin based on confirmed catchment areas, storage volumes, head conditions, discharge rates and maintenance requirements.
- 7.21. This will ensure that the final flow control arrangement is not simply scaled from the unit model but instead responds to the detailed geometry and hydraulic requirements of each catchment.

Basin Geometry and Storage Volumes

- 7.22. The LLFA requested confirmed basin cross-sections and volume / depth curves at Reserved Matters stage to demonstrate that the required volumes are achieved within the available footprints.
- 7.23. The revised drawing identifies the proposed attenuation basin locations and updated catchment arrangement. The supporting hydraulic calculations demonstrate that, on an outline unit-rate basis, the required attenuation can be modelled without flooding in the 1 year, 30 year and 100 year plus 40% climate change events.



- 7.24. At detailed design stage, each basin should be supported by detailed earthworks design, basin cross-sections, depth / area / volume curves, maintenance access arrangements, inlet and outlet details, freeboard assessment, landscape and ecological integration, and exceedance routing.

Groundwater and Basin Lining

- 7.25. The LLFA requested groundwater monitoring data to confirm basin liner requirements.
- 7.26. The detailed design should include groundwater monitoring and geotechnical information sufficient to confirm whether any attenuation basins require lining, partial lining or other groundwater protection measures. This should be reviewed alongside infiltration potential, groundwater levels, contamination risk, basin invert levels and long-term maintenance requirements.

8. Summary and Conclusion

- 8.1. The revised drainage information has been prepared to respond to the LLFA comments on the outline drainage strategy for Priors / Pearces Farm.
- 8.2. The revised site-wide drainage catchment strategy drawing, A218-025 P7, updates the flow route and catchments to suit basin updates and continues to show the proposed attenuation basins, catchment areas, outfalls, swale / filter drain corridors, overland flow routes and Flood Zone 100 year plus 14% climate change extent.
- 8.3. The greenfield runoff calculations confirm that the FEH statistical 2025 method has been used for Priors & Pearce's Farm, Wokingham, with a QBAR value derived from the UK SuDS tool and return period flow rates identified for the 1 year to 200 year events.
- 8.4. The hydraulic calculations have been prepared in Causeway Flow+ version 17.0 and demonstrate that the outline drainage model produces no flooding for the modelled 1 year, 30 year and 100 year plus 40% climate change critical storm events.
- 8.5. The note acknowledges that certain matters must be progressed at Reserved Matters / detailed design stage, including outfall survey, receiving watercourse cross-sections, fluvial level checks, final catchment boundaries, individual flow control sizing, basin depth / volume curves, swale and filter drain sizing, groundwater monitoring and confirmation of any basin lining requirements.
- 8.6. On this basis, the revised drawing and calculations demonstrate that the surface water drainage strategy remains technically deliverable at outline stage and provides an appropriate framework for detailed drainage design to be secured through planning condition.



Appendices

Appendix A – A218-025 P7 Site Wide Drainage Catchment Strategy

Appendix B – Greenfield Runoff Rate Calculation

Appendix C – Hydraulic Calculations

Appendix D – Wokingham Borough Council LLFA Consultation Response

- NOTES:
1. Do not scale.
 2. Refer to all other Project Drawings and supporting notes.
 3. All levels are in meters above Ordinance Datum.
 4. Surface Water Strategy is indicative and based on masterplanning information at the time of production.
 5. All Surface Water Calculations were Undertaken Using Causeway Flow Drainage Software and are subject to detailed design.
 6. All Outfalls have been visually determined during site walkover and are assumed viable to be utilized as surface water outfalls.

- Key:
- Application Boundary
 - Flood Zone 100yr+14%Climate Change
- Proposed Drainage
- Attenuation Basin
 - Natural Overland Flow Route (Remaining as existing)
 - Natural Overland Flow Route (Captured by the drainage system)
 - Natural Overland Flow Route (To be within proposed development)
 - Catchment Pearce 1
 - Catchment Pearce 2
 - Catchment 1
 - Catchment 2
 - Catchment 3
 - Catchment 4
 - Potential Foul Pump Station Location
 - 2m wide Swale/Filter Drain
 - 3m - 5m wide Swale/Filter Drain
 - Proposed Developable Area
 - Drainage Catchment Area
 - Basin Outfall

Development runoff parameters			
Qbar rate	4.2	l/s/ha	
1 year	3.6	l/s/ha	
30	9.7	l/s/ha	
100	13.4	l/s/ha	
LTSRate	2	l/s/ha	
Pre-development runoff volume	320	m ³ /ha	
LTSVolume	43.4	m ³ /ha	
100% AEP volume	115	m ³ /ha	
3.3% AEP volume	317	m ³ /ha	
1% AEP year volume	625	m ³ /ha	

P7	05/26	Flow route and catchments amended to suit basin updates	DZ	JS
P6	03/26	Basins 1 & 2 updated	DZ	JS
P5	07/24	Layout updated to latest version	LC	JS
P4	07/24	Discharge Points added	LC	JS
P3	03/24	Basins 1 & 2 updated	LC	JS
P2	01/24	Swales/filter drain added showing basin connections.	LC	JS
P1	12/23	First Issue	LC	JS
Rev	Date	Description	Drawn	Checked



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Client

LIGHTWOOD STRATEGIC

Project
PRIORS FARM,
SOUTH WOKINGHAM SDL

SITE WIDE DRAINAGE CATCHMENT STRATEGY

Status
FOR INFORMATION

Scale	Date	Drawn	Checked
1:2000 @ A1	DEC 2023	LC	JS
Drawing No.	A218-025		
Revision	P7		

Assumptions		
Average plot size	295	m ²
Average driveway area	17.5	m ²
Average House Area	100	m ²
Average Adopted Road Area Per Plot	45	m ²
Assumed Road Adopted Total Width	9	m
Swale Slopes 1 in	3	
Swale Granular Underdrain - 0.35m deep / 1m wide		
Assumed area of housing draining in to permeable driveway	10	m ²
Assumed average permeable private road	10	m ²
Assumed rain Garden storage per plot	1	m ³
Assumed rain Garden area per plot	6	m ³
High groundwater and infiltration not proven		

Area	Total Volume of interception for first 5mm of rainfall	Basin Lined (Y/N) *subject to additional ground water monitoring	Interception provided by Basins (m³)	Anticipated Plot numbers	Total Permeable Driveway (m²)	Assumed total area of housing draining in to permeable driveways (m²)	Interception provided by permeable driveway (m³)	Assumed total area draining into permeable shared road (m²)	Assumed interception from permeable road (m³)	Volume of Storage from Permeable Paving	Total plot rain garden area	Total Plot Rain Garden Interception	Total Plot Rain Garden Storage	Adoptable Swale length (m)	Interception provided by highway swale (m³)	Swale Depths	Swale Base widths	Surface Volume from swale	Filter Depth Below Swale	Volume from gravel beneath swale	Total Inception Achieved (m³)	Total Upstream Storage (m³)	% of 5mm interception achieved	Additional volume of interception required to comply with Standard 2 (m³)	Estimated number of plots requiring additional interception measures to comply with Standard 2	Additional Road Interception Measures Likely to be required
Pearce 2	84.4	Y	5.9	65	1138	660	12.19	660	3.25	241.31	300	1.95	66	305	8.13	0.30	1.00	185.25	0.35	37.54	31.38	529.10	37.20	66.22	65	YES
Pearce 1	94.2	Y	12.7	80	1400	800	15.00	800	4.00	297.00	480	2.40	80	400	10.00	0.50	1.00	500.00	0.35	46.20	44.14	923.20	46.85	54.08	80	YES
1	282.6	Y	14.1	277	4848	2770	51.94	2770	13.85	1028.35	1662	8.31	277	1365	34.63	0.50	1.00	1731.25	0.35	159.97	122.79	3196.59	43.46	173.62	277	YES
2	315.1	Y	9.8	312	5460	3120	38.60	3120	15.60	1158.30	1672	9.36	312	1560	39.00	0.30	1.00	1650.00	0.35	180.18	130.28	3600.48	41.98	186.39	312	YES
3	97.5	Y	3.2	92	1610	920	17.25	920	4.80	341.55	552	2.76	92	460	11.50	0.30	1.00	292.20	0.35	53.13	38.33	40.33	52	YES	92	YES
4	74.4	Y	2.4	71	1243	710	13.31	710	3.55	263.59	406	2.13	71	355	8.88	0.30	1.00	202.36	0.35	41.00	30.31	577.94	40.71	47.69	71	YES
TOTAL	948.1	-	48.1	897.0	15697.5	8970.0	168.2	8970.0	44.9	3330.1	5382.0	26.9	897.0	4485.0	112.1	-	-	4831.05	-	518.02	400.20	9576.18	220.53	592.78	897	YES

Basin(s)	Area	Catchment Area (ha)	Obar Rate (l/s)	Development Area (ha)	Type	Assumed Impermeable (%)	Impermeable Area (ha)	Pre Development runoff 360 minute storm (m³)	Permeable Area (ha)	Contributing Areas (Impermeable & Basin) (ha)	LTS Volume	LTS Rate	1:1-year Rate	1:1 volume	1:30-year Rate	1:30-Year Volume	1:100-year Rate	1:100-year Volume	Total Area (ha)	Depth (m)	Slope (1 in)	Cover (mAO)	Invert (mAO)	Base Area (m²)	Surface Area (m²)	Volume (m³)	Peak Water Level (mAO)	Freeboard (mm)	Outfall IL (mAO)	1% Flood Level at Outfall	Storage From Basins	Total Upstream SuDS (m³)	Total Storage (m³)	Outfall IL (mAO)	1% AEP + 14% CC Flood Level at Outfall	
1	Pearce 2	2.60	10.9	2.60	Residential	65	1.69	539.9	0.74	1.86	112.6	5.2	9.3	298.5	25.2	822.8	34.8	1622.2	66.69	1.5	3	61	59.5	552	1683	1249	60.7	300	59.5	-	1249.0	529.1	1778.1	59.5	-	
2	Pearce 1	3.18	13.4	2.90	Residential	65	1.88	603.0	0.99	2.19	138.1	6.4	11.5	366.0	30.9	1009.0	42.7	1989.4	66.88	1.2	3	63.65	62.45	622	3042	1118	63.15	300	62.45	62.445	1118.0	923.2	2041.2	62.45	62.445	
3	1	12.29	51.6	8.69	Residential	65	5.65	1808.4	6.10	6.19	533.3	24.6	44.2	1413.2	119.2	3895.6	164.7	7680.6	70.65	1.5	3	58.95	57.45	1926	3510	3156	58.65	300	57.45	57.416	4695.0	3196.6	7891.6	57.45	57.416	
4																				1.5	3	59.35	57.85	887	1856	1539	59.05	300	57.85	57.836				57.85	57.836	
5																				1.6	3	60.7	59.1	1021	3145	2572	60.4	300	59.1	59.069				59.1	59.069	
6	2	10.50	44.1	9.69	Residential	65	6.30	2016.4	3.71	6.79	455.7	21.0	37.8	1207.5	101.8	3328.4	140.7	6562.4	71.30	1.5	3	60.85	59.35	939	1742	1499	60.55	300	59.35	59.306	4071.0	3600.5	7671.5	59.35	59.306	
TOTAL 3-6	1-2	22.79	95.7	18.39	-	-	11.95	3824.7	9.81	12.98	989.0	45.6	82.0	2620.7	221.1	7224.0	305.4	14243.0	141.95	-	-	-	-	4773	10253	8766	-	-	-	-	8766.0	6797.1	15563.1	-	-	
7	3	3.59	15.1	3.00	Residential	65	1.95	624.0	1.37	2.22	155.8	7.2	12.9	412.7	34.8	1237.7	48.1	2243.1	66.95	1.5	3	61.35	59.85	643	2685	1550	61.05	300	59.85	59.802	1550.0	748.9	2298.9	59.85	59.802	
8	4	2.79	11.7	2.29	Residential	65	1.49	476.5	1.14	1.66	121.3	5.6	10.1	321.4	27.1	885.9	37.4	1746.7	66.49	1.5	3	58.95	57.45	488	1694	1280	58.65	300	57.45	57.416	1280.0	577.9	1857.9	57.45	57.416	
TOTAL		34.95	146.79	29.17	-	-	18.96	6068.03	14.05	20.90	1516.87	69.90	125.82	4019.37	339.02	11079.47	468.34	21844.38	408.96	-	-	-	-	484.80	473.00	7078	19357	13663.00	-	-	-	13663.00	9576.18	23539.18	-	-

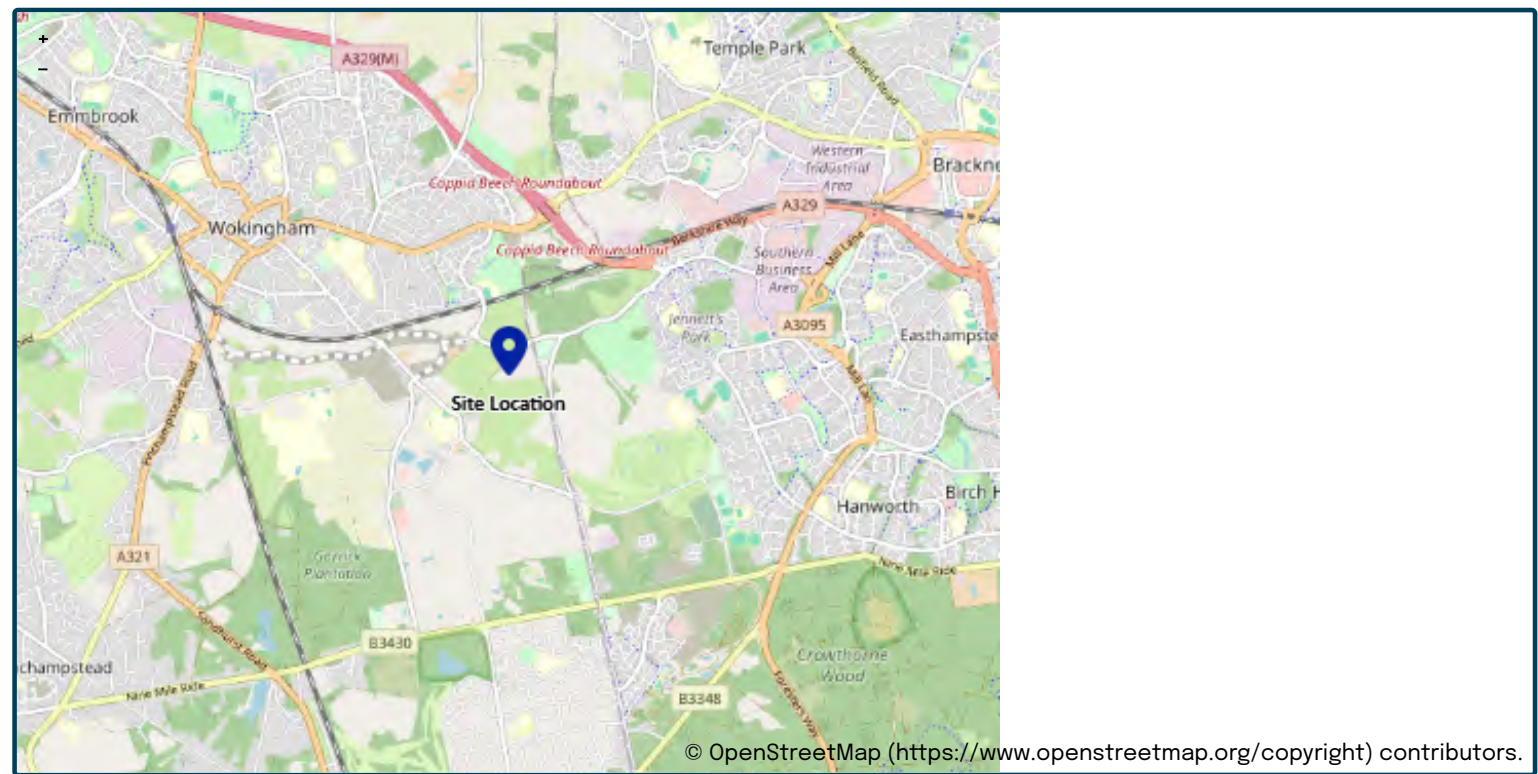
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	23/04/2026
Calculated by	JS
Reference	A218
Model version	2.2.3

Location

Site name	Priors & Pearce's Farm
Site location	Wokingham



Site easting (British National Grid)	483318
Site northing (British National Grid)	167417

Site details

Total site area (ha)	1 ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	My value	Map value
SAAR9120 (mm)	691	mm
BFIHOST19scaled	0.389	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	3.7	l/s
QBar (FEH statistical 2025) (l/s)	4.2	l/s

Growth curve factors

	My value	Map value
Hydrological region	6	6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	3.6
Flow rate 2 year (l/s)	3.7
Flow rate 10 years (l/s)	6.8
Flow rate 30 years (l/s)	9.7
Flow rate 100 years (l/s)	13.4
Flow rate 200 years (l/s)	15.7

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Design Settings

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

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
Qbar	1.000		100.000	117.432	38.528	1.500	98.500
LTS	0.650	5.00	100.000	118.665	23.629	1.500	98.500

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	100 year (l/s)	13.9	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	✓	Check Discharge Volume	✓
Summer CV	1.000	Drain Down Time (mins)	240	2 year (l/s)	3.8	100 year 360 minute (m³)	328
Winter CV	1.000	Additional Storage (m³/ha)	0.0	30 year (l/s)	10.0		

Storm Durations

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	40	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	BFIHost	0.389	Growth Factor 100 year	3.19	Q 30 year (l/s)	10.0
Greenfield Method	FEH	Region	6	Betterment (%)	0	Q 100 year (l/s)	13.9
Positively Drained Area (ha)	1.000	QBar/QMed conversion factor	1.136	QMed	3.8		
SAAR (mm)	691	Growth Factor 2 year	0.88	QBar	4.4		
Host	5	Growth Factor 30 year	2.30	Q 2 year (l/s)	3.8		

Pre-development Discharge Volume

Site Makeup	Greenfield	Soil Index	1	Return Period (years)	100	Betterment (%)	0
Greenfield Method	FSR/FEH	SPR	0.47	Climate Change (%)	0	PR	0.457
Positively Drained Area (ha)	1.000	CWI	99.556	Storm Duration (mins)	360	Runoff Volume (m³)	328

Node LTS ReFH2 Dynamic Hydrograph

Overrides Design Area	x	Depression Storage Depth (mm)	0	Region	England, Wales, NI
Overrides Design Additional Inflow	x	Evapo-transpiration (mm/day)	0	Include Baseflow	x
Depression Storage Area (m²)	0	Area (ha)	0.350		

Applies to All storms

Node Qbar Offline Hydro-Brake® Control

Flap Valve	x	Design Flow (l/s)	4.2	Min Outlet Diameter (m)	0.150
Loop to Node		Objective	(HE) Minimise upstream storage	Min Node Diameter (mm)	1200
Invert Level (m)	98.500	Sump Available	✓		
Design Depth (m)	1.000	Product Number	CTL-SHE-0097-4200-1000-4200		

Node LTS Offline Hydro-Brake® Control

Flap Valve	x	Design Flow (l/s)	2.0	Min Outlet Diameter (m)	0.100
Loop to Node		Objective	(HE) Minimise upstream storage	Min Node Diameter (mm)	1200
Invert Level (m)	98.500	Sump Available	✓		
Design Depth (m)	0.150	Product Number	CTL-SHE-0079-2000-0150-2000		

Node LTS Offline Hydro-Brake® Control

Flap Valve	x	Design Flow (l/s)	5.8	Min Outlet Diameter (m)	0.150
Loop to Node		Objective	(HE) Minimise upstream storage	Min Node Diameter (mm)	1200
Invert Level (m)	98.750	Sump Available	✓		
Design Depth (m)	0.750	Product Number	CTL-SHE-0117-5800-0750-5800		

Node LTS Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	500.0	0.0	1.000	500.0	0.0

Node Qbar Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	650.0	650.0	1.500	650.0	785.6

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	Qbar	420	98.716	0.216	21.9	140.5591	0.0000	OK
600 minute summer	LTS	510	98.729	0.229	15.2	114.4400	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
600 minute summer	Qbar	Hydro-Brake®	4.1	144.0
600 minute summer	LTS	Hydro-Brake®	2.4	84.5
600 minute summer	LTS	Hydro-Brake®	0.0	0.0

Results for 30 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
480 minute winter	Qbar	472	99.293	0.793	52.5	515.1753	0.0000	OK
360 minute summer	LTS	344	99.134	0.634	69.9	316.8599	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute winter	Qbar	Hydro-Brake®	4.2	139.5
360 minute summer	LTS	Hydro-Brake®	3.9	104.0
360 minute summer	LTS	Hydro-Brake®	5.8	143.4

Results for 100 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
600 minute winter	Qbar	600	99.951	1.451	74.9	943.4491	0.0000	OK
360 minute summer	LTS	360	99.749	1.249	122.4	624.7268	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
600 minute winter	Qbar	Hydro-Brake®	5.0	204.0
360 minute summer	LTS	Hydro-Brake®	5.3	144.6
360 minute summer	LTS	Hydro-Brake®	6.6	164.1



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