

DRAINAGE STRATEGY

Surface Water and Foul Water Management

Site Address	Birchfield Nursery, London Road, Henfield, West Sussex, BN5 9AA
Application Reference	DC/25/1828
Document Title	Drainage Strategy — Discharge of Condition 3
Local Planning Authority	Horsham District Council
Prepared By	Jack Dunckley
Date	May 2026
Revision	Rev B — Revised following HDC Drainage consultation response dated 19/12/2025

1. Introduction

This Drainage Strategy has been prepared in support of the application to discharge Condition 3 of planning permission DC/25/1828, relating to development at Birchfield Nursery, London Road, Henfield, West Sussex, BN5 9AA. The strategy addresses all matters raised in the HDC Drainage consultation response dated 19 December 2025 and has been prepared in full accordance with the requirements set out in that response.

The strategy addresses the following:

- Existing and proposed drainage patterns entering, within and leaving the site.
- Site area measurements and impermeable area calculations.
- Greenfield runoff rates (QBAR).
- Pre- and post-development peak flow rates for 100% AEP, 3.33% AEP, 1% AEP and 1% AEP + 45% climate change storm events.
- Attenuation storage volumes for the full range of design storm events.
- Foul water flows and package treatment plant sizing.
- Infiltration assessment and rationale for SuDS selected.
- Pollution prevention and water quality measures.
- Exceedance flow routes.
- Maintenance and Management Plan for all drainage features.

This strategy should be read alongside the revised Planning Statement for DC/25/1828 (Rev B, May 2026). The previously proposed approach of directing surface water or grey water to

the onsite well has been fully withdrawn. The drainage scheme set out in this strategy is compliant with the Environmental Permitting (England and Wales) Regulations 2016, HDPF Policy 38, and Building Regulations Part H.

2. Site Description and Existing Drainage

2.1 Site Description

The application site forms part of the Birchfield Nursery site on London Road (A281), Henfield, West Sussex. The drainage strategy relates to the coffee shop development and its associated site area, which has a total red line area of 1,200 m². The site is predominantly surfaced with tarmac and concrete hardstanding, with the proposed new building occupying approximately 300 m² of the total site area.

The site is located in a semi-rural setting. The ground is described as having good conditions with potential suitability for infiltration, which is addressed further in Section 5. A ditch/watercourse is located within 10 metres of the site boundary.

2.2 Existing Drainage Patterns

The existing site is predominantly impermeable, with tarmac and concrete hardstanding covering the majority of the site area. The existing surface water drainage pattern is as follows:

- Rainfall falling on the site currently runs off the impermeable hardstanding surface and drains to the existing surface water infrastructure on and adjacent to the site.
- There are no formal attenuation measures currently in place on the site.
- The existing runoff regime reflects a brownfield, predominantly impermeable site with a runoff coefficient of approximately 0.90.

The proposed development introduces a new building of 300 m² onto an area that is presently hardstanding. There is no net increase in impermeable area as a result of the development. The drainage challenge is therefore not an increase in impermeable area but rather the opportunity to significantly improve upon the existing uncontrolled brownfield runoff regime through the implementation of a fully designed SuDS attenuation and discharge system.

2.3 Flood Risk

The site is located within Flood Zone 1 as defined by the Environment Agency's Flood Map for Planning. There is no identified risk of flooding from rivers or the sea. Surface water flood risk is low given the site's topography and the drainage measures proposed in this strategy. The proposed drainage system is designed to ensure that there is no increase in flood risk on or off the site as a result of the development.

3. Site Areas and Impermeable Surface Calculations

Total Coffee Shop Site Area	1,200 m ² (0.12 ha)
Proposed Building Roof Area	300 m ²
Existing / Remaining Hardstanding	900 m ²
Total Impermeable Area (Pre-Dev)	1,200 m ² (0.12 ha) — all hardstanding

Total Impermeable Area (Post-Dev)	1,200 m ² (0.12 ha) — roof 300 m ² + hardstanding 900 m ²
Net Change in Impermeable Area	0 m ² — no increase in impermeable area
Runoff Coefficient (Cv) — Roof	0.95
Runoff Coefficient (Cv) — Hardstanding	0.90
Composite Cv (Post-Development)	0.90 (conservative, used for all calculations)

As demonstrated above, the proposed development does not increase the impermeable area of the site. The post-development drainage calculations are therefore based on managing the existing brownfield runoff from 1,200 m² of impermeable surface, restricted to a controlled discharge rate, representing a significant betterment of the existing uncontrolled brownfield runoff.

4. Surface Water Runoff Calculations

4.1 Design Rainfall Data

Design rainfall depths have been derived using the FEH (Flood Estimation Handbook) statistical method, applicable to the Henfield, West Sussex area (approximate NGR TQ 2116 1588). The design storm duration is 60 minutes. The following design rainfall depths have been adopted:

Storm Event	Design Rainfall Depth (60-min storm)
100% AEP (1 in 1 year)	21.0 mm
3.33% AEP (1 in 30 year)	38.5 mm
1% AEP (1 in 100 year)	47.0 mm
1% AEP + 45% Climate Change	68.2 mm (47.0 × 1.45)

4.2 Greenfield Runoff Rate (QBAR)

The greenfield runoff rate (QBAR) has been calculated using the IH124 methodology, adopting a standard greenfield QBAR of 2.0 l/s/ha for lowland Sussex. This represents the runoff rate from the site in an undeveloped greenfield condition.

QBAR Rate	2.0 l/s/ha
Site Area	0.12 ha
QBAR (Total Site)	0.24 l/s

The greenfield QBAR is 0.24 l/s. The practical minimum controllable discharge rate from an orifice plate restrictor is 0.5 l/s. The proposed discharge rate of 0.5 l/s therefore represents the lowest practically achievable rate for a system of this scale, and constitutes a significant improvement on the existing uncontrolled brownfield runoff of up to 20.5 l/s.

4.3 Pre-Development (Existing) Peak Flow Rates

Pre-development peak flow rates have been calculated using the Rational Method ($Q = C_v \times i \times A$):

Storm Event	Existing Peak Flow Rate
100% AEP (1 in 1 year)	6.30 l/s
3.33% AEP (1 in 30 year)	11.55 l/s
1% AEP (1 in 100 year)	14.10 l/s
1% AEP + 45% Climate Change	20.46 l/s

These flows represent the existing uncontrolled brownfield runoff from the site, currently discharging without restriction or attenuation.

4.4 Post-Development Peak Flow Rates and Proposed Discharge Rate

Following implementation of the proposed SuDS drainage scheme, all surface water runoff will be attenuated and discharged at a controlled rate of 0.5 l/s via an orifice plate restrictor to the adjacent ditch/watercourse.

Storm Event	Existing Peak Flow	Unrestricted Post-Dev Flow	Proposed Restricted Discharge
100% AEP	6.30 l/s	6.30 l/s	0.50 l/s
3.33% AEP	11.55 l/s	11.55 l/s	0.50 l/s
1% AEP	14.10 l/s	14.10 l/s	0.50 l/s
1% AEP + 45% CC	20.46 l/s	20.46 l/s	0.50 l/s

The proposed restricted discharge of 0.50 l/s represents a betterment of between 92% and 98% on the existing brownfield peak flow rates across all storm events, significantly exceeding the 50% brownfield betterment standard referenced in the HDC Drainage consultation response.

4.5 Attenuation Storage Volumes

Attenuation storage has been calculated as: $V = (C_v \times \text{Rainfall Depth} \times \text{Impermeable Area}) - (\text{Discharge Rate} \times \text{Storm Duration})$.

Storm Event	Inflow Volume (m³)	Outflow Volume (m³)	Storage Required (m³)
100% AEP	22.68	1.80	20.88
3.33% AEP	41.58	1.80	39.78
1% AEP	50.76	1.80	48.96
1% AEP + 45% CC *	73.66	1.80	71.86

* Design (critical) storm event. Required storage with 10% freeboard: 79.0 m³. Proposed attenuation system: 80 m³.

4.6 Storm Event Compliance Summary

- 100% AEP: 20.88 m³ required — contained within 80 m³ system. No excessive surcharging.
 - 3.33% AEP: 39.78 m³ required — safely contained underground. No surface flooding.
 - 1% AEP + 45% CC: 71.86 m³ required (79.0 m³ with freeboard) — safely contained within the 80 m³ attenuation system. No risk to persons or property.
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5. SuDS Strategy and Drainage Hierarchy

5.1 Drainage Hierarchy Compliance

The proposed drainage strategy has been designed in accordance with the SuDS drainage hierarchy in Building Regulations Part H and the CIRIA SuDS Manual (C753), prioritising source control and infiltration before discharge to surface water:

- Step 1 — Store and use rainwater: Roof water from the proposed building (300 m²) will be collected in a sealed 5,000-litre underground rainwater harvesting tank for reuse on site for irrigation and garden centre water supply, directly reducing the volume entering the attenuation system.
- Step 2 — Infiltration to ground: Ground conditions have been described as good. BRE365 infiltration testing will be carried out at the proposed soakaway location and depth prior to construction. Subject to results, a soakaway will supplement the attenuation system outflow.
- Step 3 — Discharge to surface water: Attenuated and filtered surface water will be discharged at a controlled rate of 0.5 l/s to the adjacent ditch/watercourse within 10 metres of the site boundary.
- Step 4 — Discharge to combined sewer: No connection to the public sewer is proposed for surface water. Foul water and surface water are kept entirely separate.

5.2 Infiltration Assessment

BRE365 infiltration testing has not yet been carried out at the time of this submission. The following desk-based assessment has been undertaken:

- The Henfield area is underlain by a mix of Weald Clay and Tunbridge Wells Sand formations. Where Tunbridge Wells Sand is present, infiltration rates are typically 1×10^{-5} to 1×10^{-4} m/s — suitable for soakaway drainage. Where Weald Clay is present, rates are typically below 1×10^{-6} m/s and soakaways would not be effective.
- Given the site owner's description of good ground conditions, infiltration is considered likely but must be confirmed by BRE365 testing prior to construction.
- The attenuation system has been designed to function fully without reliance on infiltration, with the restricted outfall to the watercourse providing the primary discharge route. Any infiltration achieved through the soakaway supplements this and represents additional betterment.

5.3 Proposed SuDS Components

5.3.1 Rainwater Harvesting Tank (Roof Water)

A sealed, underground proprietary rainwater harvesting tank of 5,000 litres capacity will be installed below ground to collect roof water from the 300 m² building roof. The tank is a fully enclosed, watertight system with no connection to the groundwater table and no risk of groundwater contamination. Roof water enters the tank via a filtered inlet; harvested rainwater is pumped to surface for reuse on site for irrigation and garden centre supply. Overflow from the tank discharges to the geocellular attenuation system via a gravity connection. Estimated annual harvest: 172 m³/year (approximately 472 litres/day average).

5.3.2 Hydrocarbon/Silt Separator — Hardstanding Drainage

All surface water runoff from hardstanding areas will pass through a proprietary Class 1 full-retention hydrocarbon and silt separator (to BS EN 858) prior to entering the attenuation system. This removes sediment, hydrocarbons and contaminants from vehicle movements before discharge, protecting the receiving watercourse from pollution.

5.3.3 Geocellular Attenuation Tank

A geocellular attenuation tank of 80 m³ capacity will be installed beneath the hardstanding. Geocellular modular crate systems (such as Polypipe Stormcell, ACO StormBrixx, or equivalent) provide a high void ratio storage system suitable for installation beneath hardstanding. The system will be wrapped in a geotextile membrane to prevent ingress of fines and will be accessible via inspection chambers at each end. Indicative dimensions: approximately 27 m × 3 m × 1 m depth, subject to final design.

5.3.4 Orifice Plate Restrictor and Outfall to Watercourse

The geocellular attenuation tank outlet will be controlled by an orifice plate restrictor set at 0.5 l/s, discharging via a headwall structure to the adjacent ditch/watercourse within 10 metres of the site boundary. A non-return valve will be incorporated at the outfall to prevent surcharging during high water levels in the receiving watercourse.

5.3.5 Soakaway (Subject to BRE365 Confirmation)

Subject to BRE365 infiltration testing results, a soakaway will be incorporated to supplement the attenuation system outflow. If testing confirms insufficient infiltration rates, the scheme will operate entirely via the restricted outfall to the watercourse.

6. Foul Water Drainage

6.1 Foul Water Flows

Foul water flows have been calculated in accordance with Sewerage Sector Guidance and Building Regulations Part H, based on the anticipated occupancy and usage of the coffee shop:

Building Use	Coffee shop / café
Estimated Covers	50 covers, 3 sittings per day = 150 customer visits/day
Staff	10 staff per day
Foul Flow — Customers	150 × 10 l/person = 1,500 litres/day (BS EN 12056)
Foul Flow — Staff	10 × 50 l/person = 500 litres/day
Total Daily Foul Flow	2,000 litres/day
Peak Foul Flow (8hr day)	0.069 l/s

Population Equivalent	Approximately 27 PE — 30 PE package treatment plant proposed
Trade Effluent	Kitchen/wash-up waste — grease trap fitted before treatment plant inlet

6.2 Package Sewage Treatment Plant

The site does not have access to the public foul sewer network. Foul water will be treated onsite by a 30-population equivalent (PE) package sewage treatment plant (PSTP), which is the most appropriate and high-quality solution for this rural location. A package treatment plant is selected in preference to a septic tank as it produces a significantly higher quality of treated effluent, reducing environmental risk and providing a robust, low-maintenance foul water solution consistent with best practice for commercial developments.

The package treatment plant will be designed, supplied and installed in accordance with the following standards and requirements:

- British Standard BS EN 12566-3 (Small Wastewater Treatment Systems — Packaged and/or Site-Assembled Domestic Wastewater Treatment Plants).
- Building Regulations Part H (Drainage and Waste Disposal).
- Environment Agency guidance: Sewage Treatment Systems — Environmental Permits and Exemptions.
- The treated effluent quality will meet or exceed the standard required for discharge under an Environmental Permit or Exemption issued by the Environment Agency.

Treatment Plant Type	Package sewage treatment plant (PSTP) — activated sludge / biozone process
Population Equivalent (PE)	30 PE
Daily Flow Capacity	30 PE × 150 l/PE/day = 4,500 litres/day design capacity
Actual Daily Flow	2,000 litres/day (67% of design capacity — adequate headroom)
Effluent Quality (typical)	BOD < 20 mg/l, Suspended Solids < 30 mg/l (to BS EN 12566-3)
Grease Trap	Proprietary grease trap fitted between kitchen drainage and treatment plant inlet
Permit / Exemption	Environmental Permit or registered Exemption — Environment Agency, Environmental Permitting Regulations 2016
Effluent Discharge	Treated effluent to be discharged to appropriate receiving point in accordance with permit conditions — soakaway field or watercourse as directed by the Environment Agency
Power Supply	Mains electrical connection required for blower/aeration unit
Alarm	Audible and visual alarm for plant failure — wired to site control panel

Maintenance Contract	Annual service contract with manufacturer or approved contractor — mandatory
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6.3 Advantages of Package Treatment Plant over Septic Tank

A 30 PE package treatment plant is selected in preference to a septic tank for the following reasons:

- **Effluent quality:** A PSTP produces treated effluent to a significantly higher standard than a septic tank (typically BOD < 20 mg/l, SS < 30 mg/l versus septic tank effluent which requires further treatment in the ground). This reduces environmental risk and the likelihood of future regulatory issues with the Environment Agency.
- **Smaller discharge footprint:** The higher quality effluent from a PSTP can typically be discharged to a watercourse or smaller infiltration area than septic tank effluent, providing greater flexibility and reducing the land take required for effluent disposal.
- **Commercial use suitability:** For a coffee shop with kitchen/catering facilities generating grease and food waste, a PSTP with a grease trap provides a more robust and appropriate treatment solution than a septic tank.
- **Regulatory compliance:** Environment Agency guidance encourages the use of package treatment plants in preference to septic tanks for new developments where possible, particularly where there is a risk of impact on nearby watercourses or groundwater.
- **Capacity:** The 30 PE plant provides a design capacity of 4,500 litres/day against an estimated actual daily flow of 2,000 litres/day, providing 67% headroom for increases in usage without requiring infrastructure changes.

The package treatment plant will be entirely separate from the surface water drainage system. No surface water, roof water or clean water will enter the foul drainage system.

7. Pollution Prevention and Water Quality

The following measures will be incorporated to prevent pollution of receiving groundwater and surface water, in accordance with the requirements of the HDC Drainage consultation response and the Environmental Permitting (England and Wales) Regulations 2016:

- **Hydrocarbon/silt separator:** All hardstanding runoff will pass through a proprietary Class 1 full-retention separator (to BS EN 858) prior to entering the attenuation system, removing sediment, hydrocarbons and contaminants.
- **Sealed rainwater harvesting tank:** Roof water is inherently clean and stored in a sealed underground tank — a fully enclosed, watertight system with no connection to the groundwater table and no risk of groundwater contamination.
- **Geotextile membrane to attenuation tank:** Prevents sediment ingress and protects groundwater quality.
- **Grease trap:** A proprietary grease trap will be installed between the kitchen drainage and the package treatment plant inlet, removing fats, oils and greases from catering waste water before they enter the treatment process.
- **Package treatment plant integrity:** The PSTP is a sealed, watertight system producing high-quality treated effluent to BS EN 12566-3. Regular servicing under a

mandatory annual maintenance contract ensures continued performance and prevents any risk of pollution.

- Site drainage separation: Foul water and surface water drainage systems are fully separate throughout the site, with no cross-connections.
- The onsite well has no connection to any drainage system and will not receive any surface water, roof water, grey water or foul water. The well is excluded from the drainage strategy entirely.

8. Exceedance Flow Routes

In the event of a storm event exceeding the 1% AEP + 45% climate change design event, exceedance flows will be managed as follows:

- Once the 80 m³ geocellular attenuation tank reaches capacity, water will pond on the hardstanding surface of the site, which acts as a natural ponding area within defined boundaries.
- The site topography will be reviewed at detailed design stage to ensure overland flow routes are directed away from the building and towards defined low points.
- The adjacent ditch/watercourse within 10 metres of the site boundary provides a natural exceedance route for extreme flows, receiving any overland flow before it can affect third-party property.
- Maximum flood depth on the hardstanding during a beyond-design event is estimated to be shallow (less than 150 mm) given the small catchment area and proximity of the watercourse.
- No exceedance flows will be directed towards neighbouring properties or the public highway.

A formal exceedance flow route plan will be produced at detailed design stage and submitted to HDC Drainage for review prior to construction commencing.

9. Maintenance and Management Plan

9.1 Responsible Party

The ongoing maintenance and management of all surface water and foul drainage infrastructure will be the responsibility of the site owner, Jack Dunckley, or their appointed managing agent. A named drainage maintenance contact will be designated prior to first occupation and their details provided to the Local Planning Authority on request.

9.2 Surface Water Drainage — Maintenance Schedule

Component	Maintenance Task	Frequency	Responsible Party
Hydrocarbon/silt separator	Inspect, empty silt trap, check for blockages	6-monthly (or after major storm events)	Site owner / appointed contractor

Geocellular attenuation tank	CCTV inspection via access chambers; jetting if required	Annually	Specialist drainage contractor
Orifice plate restrictor	Check for blockage, clear debris	6-monthly	Site owner / appointed contractor
Outfall to ditch/watercourse	Inspect headwall; clear debris; check non-return valve operation	Annually and after major storms	Site owner
Rainwater harvesting tank	Inspect via access cover; clean inlet filter screen; check pump operation and overflow connection	Annually	Site owner
Soakaway (if installed)	Check for silting; inspect access chamber	Annually	Site owner / appointed contractor

9.3 Foul Water Drainage — Maintenance Schedule

Component	Maintenance Task	Frequency	Responsible Party
Grease trap	Empty grease and solids; clean and inspect	Monthly (or per manufacturer guidance)	Site owner / catering operator
Package treatment plant	Full service inspection; desludge as required; check blower and alarm	Annually minimum — mandatory service contract with approved contractor	Manufacturer-approved service contractor
Package treatment plant	Check alarm panel, aeration unit, and effluent quality	6-monthly interim check	Site owner / service contractor
Effluent discharge point	Inspect discharge point; confirm effluent quality meets permit conditions	Annually	Site owner / service contractor

All maintenance activities will be recorded in a drainage maintenance log retained on site. Records will be made available to the Local Planning Authority and the Environment Agency on request. Proprietary device manuals for all installed drainage components will be held on site.

10. Conclusion and Policy Compliance

This Drainage Strategy demonstrates that the proposed development at Birchfield Nursery, London Road, Henfield (DC/25/1828) can be drained in a fully compliant, sustainable and

technically sound manner. The strategy directly addresses each of the requirements set out in the HDC Drainage consultation response dated 19 December 2025.

In summary:

- The total site area is 1,200 m² (0.12 ha) with a roof area of 300 m². The site is fully impermeable pre- and post-development with no net increase in impermeable area.
- Greenfield QBAR is 0.24 l/s. The proposed restricted discharge of 0.50 l/s achieves a 92–98% betterment of existing brownfield peak flows across all storm events, significantly exceeding the 50% betterment standard.
- Attenuation storage of 80 m³ (geocellular system) safely contains all storm events up to and including the 1% AEP + 45% climate change design event (79.0 m³ required with 10% freeboard).
- Surface water is filtered through a hydrocarbon/silt separator (BS EN 858), attenuated in the geocellular tank, and discharged at 0.5 l/s to the adjacent ditch/watercourse.
- Roof water is first collected in a sealed 5,000-litre rainwater harvesting tank for on-site reuse (irrigation and garden centre supply), with overflow to the attenuation system.
- BRE365 infiltration testing will be carried out prior to construction to confirm soakaway feasibility, with the scheme designed to function fully without reliance on infiltration.
- Foul water is treated by a 30 PE package sewage treatment plant (PSTP) to BS EN 12566-3, registered with the Environment Agency under the Environmental Permitting Regulations 2016. A grease trap protects the plant inlet. A mandatory annual service contract ensures continued performance.
- The 30 PE PSTP provides a design capacity of 4,500 litres/day against an estimated actual daily flow of 2,000 litres/day, providing significant headroom and ensuring the system is not operating at capacity.
- The onsite well has no connection to any drainage system.
- A full Maintenance and Management Plan is provided for all drainage features.

The strategy is fully compliant with HDPF Policy 38 (Sustainable Drainage), Building Regulations Part H, BS EN 12566-3, the CIRIA SuDS Manual (C753), the Environmental Permitting (England and Wales) Regulations 2016, and West Sussex LLFA standards. The applicant respectfully requests that HDC Drainage withdraws its objection and confirms that the revised drainage strategy is acceptable to discharge Condition 3 of planning permission DC/25/1828.

— End of Drainage Strategy —