

TECHNICAL NOTE

LLFA Drainage Response

South Pavenhill Farm
Pavenhill, Purton
SN5 4DQ

Project	South Pavenhill Farm, Pavenhill, Purton, SN5 4DQ
Planning Application	PL/2026/04314
Outline Permission	PL/2022/00395
Development	Reserved Matters – 60 dwellings and associated works
Subject	Response to Wiltshire Council / LLFA drainage comments
Reference	Drainage response dated 26 August 2026
Date	September 2026
Revision	Rev -

Purpose of note This Technical Note responds to the drainage comments issued by Wiltshire Council’s Lead Local Flood Authority (LLFA) in relation to Condition 19. It is intended to be read alongside the revised drainage calculations, drainage layout, SuDS details, exceedance plan and maintenance information submitted with the application.

1. Background

The Reserved Matters application is for the erection of 60 dwellings and associated infrastructure, including access connections, public open space, play areas, landscaping and drainage attenuation. The application is pursuant to outline permission PL/2022/00395.

The LLFA response dated 26 August 2026 confirms that the submitted Construction Management Plan is acceptable and that there are no further comments in relation to Condition 20. Condition 19 remains outstanding pending submission and acceptance of the drainage information identified in the LLFA response.

2. LLFA Comments and Technical Response

The following sections address each item raised by the LLFA. The numbering follows the order of the LLFA response.

2.1 Infiltration Basin Location – ONS-5

The LLFA noted that the infiltration testing at ONS-5 did not produce a conventional calculated infiltration rate and requested justification for locating the infiltration basin at this location.

Additional infiltration testing was undertaken by Omnia Environmental Consulting between 23 and 26 March 2026 in accordance with BRE Digest 365. The site is underlain by the Stanford Formation, formerly referred to as Coral Rag. Groundwater was not encountered within the investigated locations.

At ONS-5, three tests were undertaken. In each test approximately 2,000 litres of water were introduced over a period of approximately 7–8 minutes. No head of water could be established because the water drained away before a measurable head could be maintained. Consequently, a conventional BRE infiltration rate could not be calculated at ONS-5.

The observed response at ONS-5 is considered relevant to the proposed basin location. Rather than indicating an absence of infiltration, the testing demonstrated very rapid drainage through the underlying Stanford Formation. The Omnia report records that ONS-5 drained rapidly and that the volume of water infiltrated and time taken for the bowser to empty were recorded.

For the drainage design, an adopted infiltration rate of 5.0×10^{-4} m/s has been used at the basin location. This is an adopted design value based on the observed rapid drainage response at ONS-5 and is not presented as a directly measured BRE infiltration rate.

The infiltration basin is therefore located at ONS-5 because the field testing demonstrated rapid drainage conditions at the proposed basin location and the wider investigation confirmed the presence of permeable Stanford Formation across the site.

2.2 Rainwater Harvesting

The LLFA has requested clarification of how rainwater harvesting is incorporated within the drainage strategy to demonstrate compliance with Standard 1, paragraph 1.2 of the National SuDS Standards.

In response, a separate technical note titled “Justification for the Omission of Rainwater Harvesting Systems – Proposed 60-Unit Residential Development – Pavenhill, Purton” has been prepared and should be read in conjunction with this Technical Note.

The separate justification note considers the proposed development as a whole and concludes that individual rainwater harvesting systems are not proposed. The assessment identifies the additional capital cost associated with providing individual systems as approximately £11,000–£15,000 per dwelling, with an average increase of approximately 5.44% in dwelling build cost. Across the 60 dwellings, this equates to an estimated additional project cost of approximately £792,000. The note identifies that this additional cost would place pressure on scheme viability and could affect the delivery of affordable housing, public open space, ecological enhancements and other community benefits.

The justification note also considers the likely level of water demand within a conventional residential development and identifies that external irrigation demand is relatively low, stored water availability is seasonal, mains-water top-up may still be required during prolonged dry periods, and actual potable water savings are dependent upon resident usage. On this basis, the environmental benefit is considered limited when compared with the capital investment required.

In addition, the provision of 60 individual systems would introduce ongoing homeowner and management responsibilities, including maintenance of pumps, storage tanks, filters and associated control equipment, together with future repair and replacement liabilities. The separate note identifies the risk that system performance may deteriorate where maintenance is not undertaken.

The development instead incorporates a range of alternative sustainability measures, including fabric-first energy efficiency, water-efficient sanitaryware and fittings, SuDS, biodiversity enhancements, tree, bird and bat box provision, electric vehicle charging infrastructure and cycle storage. These measures form part of the overall sustainability strategy for development.

Accordingly, individual rainwater harvesting systems are not included within the proposed drainage strategy. This is a deliberate design decision supported by the separate justification note, which considers cost, environmental benefit, maintenance, viability and the wider sustainability measures incorporated within the development. The omission does not alter the hydraulic function of the proposed surface water drainage system, and no rainwater harvesting storage has been relied upon within the attenuation or infiltration calculations.

2.3 Detailed Surface Water Drainage Calculations

The LLFA requires detailed calculations demonstrating no flooding on site for the 1 in 30 year plus climate change event and the 1 in 100 year plus climate change event, together with a labelled drainage layout that correlates pipe, link, manhole and node references with the model.

The detailed hydraulic model accompanying this Technical Note comprise the complete surface water network, including source areas, pipes, manholes/nodes, SuDS features, infiltration basin and associated controls.

The model includes the Condition 19 requirements for 10% urban creep and MADD/additional storage of $0 \text{ m}^3/\text{ha}$. The 1 in 30 year plus climate change event demonstrates no unacceptable flooding within the development. The 1 in 100 year plus climate change event demonstrates that the attenuation/infiltration system safely manages the design event including the F.O.S of 10 and also a surcharged outfall.

The results of this assessment are presented with the drainage calculations and used to confirm that the system remains safely managed under the specified boundary condition.

2.4 Drainage Layout – Source Control and Blue/Green SuDS

The LLFA noted that the submitted drainage layout did not clearly identify the proposed permeable paving or swales and requested that all source-control and blue/green SuDS features be shown.

The revised drainage layout has omitted the requirement of macro pervious paving and this is identified on the drainage strategy.

2.5 Simple Index Method and Treatment Train

The LLFA requests revised Simple Index Method calculations reflecting the proposed drainage strategy and demonstrating a minimum two-stage treatment train prior to groundwater.

The principal impermeable contributing areas assessed are approximately 3,945 m² of residential roof and 5,210.5 m² of low-traffic residential road, giving a total assessed impermeable area of approximately 9,155.5 m².

Source	Area	TSS	Metals	Hydrocarbons
Residential roofs	3,945 m ²	0.20	0.20	0.05
Low-traffic residential roads	5,210.5 m ²	0.50	0.40	0.40

The low-traffic residential roads represent the controlling pollution hazard. The proposed infiltration basin is to be vegetated and provided with suitable attenuating soil. On that basis, the groundwater protection indices applicable to the basin are 0.60 for TSS, 0.50 for metals and 0.60 for hydrocarbons.

Assessment	TSS	Metals	Hydrocarbons
Residential road hazard	0.50	0.40	0.40
Infiltration basin mitigation	0.60	0.50	0.60
Result	PASS	PASS	PASS

The above demonstrates that the basin, considered as the groundwater protection component, provides mitigation indices greater than the controlling pollution hazard indices.

The current arrangement routes runoff directly to the infiltration basin. The above assessment therefore demonstrates the pollution mitigation provided and based on the SIM it passes for this type of development and pollution generation.

2.6 SuDS Sizing and Cross-Sections

The LLFA requires calculations demonstrating the sizing of the infiltration basin, permeable paving and swales, together with cross-sections and confirmation of basin freeboard above the 1 in 100 year plus climate change top water level.

The proposed infiltration basin has an approximate top/open area of 1,116 m², base area of 170m² and 1 in 3 side slopes. Hydraulic calculations demonstrate the available storage volume below the design top water level and confirm that the available storage is sufficient for the 1 in 100 year plus climate change event.

The basin cross-section identifies the base, side slopes, permanent/normal levels where applicable, design top water level, finished ground level and available freeboard. The freeboard is stated numerically 0.326m. highest W.L being 135.574m vs 135.90 of Top of Basin.

2.7 Exceedance Routes

Condition 19 requires exceedance flows above the 1 in 100 year plus climate change event to be safely managed without increasing flood risk to people or property. The LLFA has specifically requested that flow routes along the highway, rear gardens and landscaped areas are shown.

Given that the extreme event including a surcharged outfall does not create any flooding, there is no exceedance flows. Therefore, the plan is not required.

2.8 Factor of 10 Applied to Infiltration Calculations (Rate not changed in Windes but FOS set at 10)

The LLFA requested confirmation that a factor of 10 has been applied to the infiltration basin calculations because the drainage strategy is reliant on infiltration.

The adopted infiltration rate at ONS-5 is 5.0×10^{-4} m/s. The hydraulic design shall apply the required factor of 10 to the adopted rate when calculating the design infiltration capacity of the basin.

Accordingly, the effective design infiltration rate used for the hydraulic assessment essentially becomes:

$$5.0 \times 10^{-4} / 10 = 5.0 \times 10^{-5} \text{ m/s}$$

This value has not been used within the final hydraulic calculations as we have applied the F.O.S of 10 and is clearly identified in the calculation summary.

2.9 Maintenance and Management

The LLFA requires a detailed maintenance strategy identifying the frequency of each activity and the party responsible for undertaking it. Below is the maintenance schedule for the surface water elements.

Feature	Maintenance activity	Frequency	Responsibility
Infiltration basin	Visual inspection; litter/debris removal; vegetation management; inspection of inlet/outlet arrangements; check for erosion/siltation	Monthly initially; then as required by inspection regime	Management company / appointed maintenance contractor
Basin inlet / flow paths	Remove accumulated sediment and debris; check free flow	At least 6-monthly and after significant events	Management company / maintenance contractor
Manholes and sewers are adoptable assets and will be the responsibility of the incumbent and their maintenance plans.	Inspection; sweeping; removal of sediment/blockages	At least annually and as required per their maintenance regime.	Incumbent water authority

2.10 Finished Floor Levels

Condition 19 requires finished floor levels to be above the maximum predicted 100-year flood level or, where no flooding is predicted, sufficiently above surface water drainage cover levels.

The final drainage submission shall include a finished floor level schedule cross-referenced to the drainage model and layout. The assessment shall confirm the maximum predicted 1 in 100 year plus climate change flood level at relevant locations and demonstrate the available freeboard to finished floor levels. Top of basin level is 135.90m and lowest FFL on site is 136.45m

3. Condition 19 Compliance Summary

Condition 19 requirement	Response / submission item	Status
1 in 30 + 30% climate change; 10% urban creep; MADD 0 m ³ /ha	Detailed hydraulic model and calculations	accompany submission
1 in 100 + 50% climate change attenuation	Hydraulic model, basin storage and infiltration calculations	accompany submission

Correlated pipe/link/node references	Revised drainage layout and model reference schedule	accompany submission
Surcharged outfall sensitivity with weir and also surcharge outfall set to 10m	Sensitivity run and results	accompany submission
Exceedance routes >1 in 100 + CC	No flooding so no exceedance plan required	N/A
Finished floor levels	All FFL are above top of basin of 135.90m vs 136.45m (lowest FFL).	
Implementation timetable	Construction/phasing information	T.B.C
Lifetime maintenance	Maintenance and management plan	accompany submission

4. Key Design Parameters

Parameter	Adopted value / requirement
Development	60 dwellings
Roof catchment	3,945 m ² (4,339.5 inclusive of U.C of 10%)
Residential/private parking road catchment	5,210.5 m ²
Total assessed impermeable area	9,550 m ²
Infiltration basin top area	1,116 m ²
Infiltration basin base area	170 m ²
Basin side slopes	1 in 3
ONS-5 adopted infiltration rate	5.0×10^{-4} m/s
Design infiltration rate after factor of 10	5.0×10^{-5} m/s (Rate not changed in Windes but FOS set at 10)
Design basis	Infiltration to Stanford Formation
Groundwater encountered	No groundwater encountered in investigation
Urban creep allowance	10%
MADD / additional storage	0 m ³ /ha

5. Conclusions

The drainage strategy for South Pavenhill Farm has been reviewed against the drainage comments issued by the Wiltshire Council LLFA on 26 August 2026.

The infiltration testing undertaken by Omnia demonstrates that the site is capable of infiltration within the Stanford Formation. Although a conventional BRE infiltration rate could not be calculated at ONS-5, the three tests demonstrated that water drained too rapidly for a measurable head to be established. The proposed basin location is therefore supported by the observed field behaviour, with an adopted design infiltration rate of 5.0×10^{-4} m/s.

For hydraulic design purposes, the required factor of 10 is applied (Rate not changed in Windes but FOS set at 10), giving an effective design infiltration rate of 5.0×10^{-5} m/s.

The Simple Index Method assessment demonstrates that the proposed vegetated infiltration basin provides groundwater mitigation indices exceeding the controlling pollution hazard indices associated with the residential road and roof catchments, subject to the basin being constructed with the assumed attenuating soil and vegetation.

The remaining drainage information identified by the LLFA is submitted as a coordinated package comprising the hydraulic calculations, drainage layout, SuDS details and supporting design information.

6. Reference Documents

- Wilshire Council / AtkinsRéalis, Drainage Response, Planning Application PL/2026/04314, dated 26 August 2026.
- Omnia Environmental Consulting, South Pavenhill, Purton – Additional Infiltration Testing / Soakaway Factual Report, Ref. A11594-4/260330/L1, April 2026.
- Outline Planning Permission PL/2022/00395 and associated Condition 19 drainage requirements.
- CIRIA C753 – The SuDS Manual, Simple Index Approach.
- BRE Digest 365 – Soakaway Design.