Technical Note

Project: Review of revised surface water drainage strategy (04/25)

Subject: APP/W0340/W/24/3356688 - 23/00815/FUL - Land south of Sandhill, Hermitage, Thatcham

Client/stakeholder:	Planning	**Version:**	1.0
Project No:	APP/W0340/W/24/3356688	**Author:**	Paul Bacchus
Date:	12/05/25	**Approved:**	N/A

This note contains a review of the revised drainage strategy submitted by Flume Consulting Engineers.

Background

The planning application was refused in part due to issues with the previous submitted drainage strategy and supporting information. The matters preventing conditional approval included:

- "The development of this site for 5 gypsy and traveller site pitches has caused increased hardstanding and non-permeable material to be placed across the application site, with associated works/ stationing of sanitary units. The local planning authority on behalf of the lead local flood authority is not satisfied with the details and quality of the suds information submitted with the application to date . Accordingly, in taking the precautionary approach , it is considered that the development/ change of use proposed is contrary to the advice in policy CS16 in the WBCS of 2006 to 2026 and the advice in bullet points 1 and 7 in policy TS3 in the HSADPD of 2017."

The appellant has not provided acceptable evidence that there is a viable surface water drainage solution on site. The main issues are regarding submitted evidence and associated calculations in support of ground investigations, and concerns regarding the drainage strategy including issues with calculations and alternative discharge locations. The LLFA do not believe the appellant has provided a suitable analysis of ground conditions to support the surface water drainage strategy in accordance with best practice/national standards contravening policy CS16 of WBC's Core Strategy.

- As highlighted in the response to the LPA on 08/10/2024 the Factual Report submitted by Jaxx Engineering used to support the Drainage Strategy does not adhere to best practice and contains errors. The LLFA does not consider the test results to be valid without further information and testing.
    - Infiltration testing was carried out in summer (21/08/2024). The details of the trial pit locations were not provided and no pictures or evidence of the trial pits

provided. Ground investigations should be carried out in winter or early spring to account for the performance of underlying soils subject to infiltration during seasonally wet periods and to establish groundwater levels. This is stated in section 3.2.3 of BRE365 2016 (appendix A). Evidence of testing should include the location of trial pits dug to ensure that the appropriateness of the results can be assessed.

- The underlying strata was identified as being comprised of clay underlain by sand with made ground in the upper surface layer. According to the report "sandy CLAY" is encountered between roughly 150-170mm below ground level (bgl) to depths of around 1800mm bgl. The infiltration rates in the Jaxx report were not representative of clay like materials which is classified as being poor or very poor infiltration media. C753 The SuDS Manual (appendix B) Table 25.1 suggests clay has infiltration rates in the region of ($<3x10^{-8}$m/s). Whilst betterment on these rates is not unexpected with the presence of other sediments, the range of values from testing still does not reflect clay like materials.

- The infiltration rates calculated in the Jaxx Engineering report are incorrect. Testing in accordance with BRE365 requires repeat filling of trial pits with water and timing the time it takes to empty. Typically, the tester would expect the rate of emptying (infiltration rate) to slow with each test as the ground becomes more saturated. In the two trial pits that were used (referred to by letters as A and B) the rates increased. In the tests 'BRE TP1 – B' and 'BRE TP2 – B' the rate increased from $1.05x10^{-5}$m/s to $9.18x10^{-4}$m/s (over 87 faster on the second test). This is not believed to be possible under normal circumstances and warranted further scrutiny.

- A spot check on 'BRE TP1 – A' was carried out by the LLFA to check the validity of the results. The rate of 'BRE TP1 – A' of $1.48x10^{-4}$m/s is more than 5x greater than the actual rate using the raw values with the used equation in section 3.2.3 of BRE365 2016 (the LLFA determined that the actual rate would be $2.78x10^{-5}$m/s). Further checks demonstrated similar differing results. Prior to the planning decision the LLFA called Jaxx Engineering Consultancy to discuss the results, the representative confirmed they were likely incorrect and would provide revised information (this was not received prior to determination).

- Groundwater hasn't been assessed but isn't anticipated to be an issue in this area (high elevation and no groundwater flood risk anticipated in the WBC SFRA).

- Unfortunately, whilst the information submitted does not rule out the use of infiltration devices, the calculation errors, failure to carry out testing during a seasonally wet period and failure to provide evidence or record the location of trial pits renders the submitted information unacceptable in its current state.

- Issues with the Drainage Strategy produced by Flume Consulting Engineers

  - As highlighted in the response to the LPA on 08/10/2024 the Drainage Strategy submitted by Flume Consulting Engineers is flawed and contains

outstanding issues which were not resolved prior to the decision. The LLFA does not consider the surface water Drainage Strategy to be valid without further information and resolution of outstanding issues.

- Figure 4 of the report confusingly refers to infiltration rates being determined at a later stage despite being established by supporting evidence and discussed in the report. The rate used in the calculations from the Flow Drainage Strategy Appendix B is 0.03780m/hr which corresponds to $1.04x10^{-5}$m/s (equivalent to the slowest rate from the Jaxx Engineering report). Whilst the Jaxx Engineering report values are incorrect, in this instance the value is slower than the rate the LLFA calculates to be correct $2.0202x10^{-5}$m/s. Unfortunately, as previously established in clause □o the Jaxx Engineering Consultancy evidence is not considered to be valid.

- An exceedance plan has not been provided. A single arrow on the SuDS scheme drawing shows exceedance leaving the site towards the northwest and B4009. Exceedance needs to be substantiated with levels assessment across the site and evidence of how the site shed runoff prior to development. This is relevant to understand the consequences of failure of the system and to inform calculations. Providing the appellant can provide storage of water up to the 1 in 100 years plus climate change storm event within the site boundary, exceedance onto the highway is not necessarily prohibited, however alternative potential exceedance arrangements might be preferable. Any increase or residual flood risk to the highway below the 1 in 100-year event plus climate change is not acceptable. Water on the highway creates an immediate skidding risk, results in potential for ice on the road which is a significant health risk to the public, and rapid deterioration of the highway. Inadequate drainage provision would be considered a nuisance problem.

- There are issues with the calculations for the surface water drainage system.

- The rainfall data that has been used should be FEH rainfall data not FSR.

- CV values should be revised to 0.9-1.0 where 100% rainfall capture is anticipated.

- The infiltration rate is not valid.

- Only the base should be considered as being viable for infiltration when designing permeable paving.

- Based on the limited exceedance information submitted the safety factor should be raised to 10 (see table 25.2 of C753 The SuDS Manual).

We therefore need to see in the new drainage strategy:

1. Valid ground investigation information.
2. Updated drainage strategy and associated calculations.

Revised information 04/25

Flume Consulting Engineers submitted an updated drainage strategy as part of the appeal process on the 23rd April 2025.

A section addressing the LLFA's concerns (pg. 2-3) states that the new drainage strategy contains updating ground investigation results, updated content and a rework of calculations.

- According to the drainage strategy the appellant commissioned a new consultant WDE Consulting in April 2025 to carry out ground investigations in April 25.
- The new infiltration results range between $1.26x10^{-5}$m/s to $2.24x10^{-5}$m/s. This information is shown clearly in appendix A.
- Reviewing the information within appendix A from WDE Consulting
    - The location of 3 trial pits is shown in figure 3 intrusive location plan.
    - Pictures of the trial pits on site have been taken.
    - Strata data has been submitted confirming the ground type as sand.
    - 3 tests were successfully carried out in trial pits 1, 2 and 3.
    - Spot checks on the calculations show the infiltration rate has been calculated correctly from the input data.
    - It is not clear why the appellant has only partially filled each trial hole but given the relatively uniform strata recorded and differing water levels assessed/depth of trial pit, the calculations and assessment of infiltration rate can be considered valid/in accordance with BRE365 section 3.2.3.

We are satisfied that the new geotechnical data used in the updated drainage strategy is acceptable. This addresses the major concern relating to the data used in the previous strategy.

- With respect to the proposed drainage strategy the appellant has stated they have used the new determined worst case infiltration rate of$1.26x10^{-5}$m/s.
- The appellant withes to use 350mm subbase for storage under open graded permeable gravel which is acceptable. Type C granular material should be used for drainage purposes (can be conditioned).
- The maintenance and monitoring section needs to clarify who is responsible for the maintenance of the system (can be conditioned).
- Generally, the drainage strategy has been developed to a concept/outline level and will need to be conditioned.
- The permeable pavement detail isn't correct.
- There are minor issues with the calculations, but nothing that cannot be addressed with conditions as both the baseline data is correct as are the input values.
- The appellant hasn't fully developed exceedance information and has still failed to provide on site levels. They have provided arrows on the plan and annotations suggesting water will be retained on site. Clarity regarding the flow route to the northwest should be provided.

Whilst still lacking detail, the drainage strategy has been developed to a standard which provides confirmation that a solution in this location in accordance with the submitted information is viable. There are still some concerns regarding exceedance however, as there is increased certainty over the viability of design this matter could be conditioned.

Conclusion

The updated drainage strategy addresses the councils' previous comments and presents a viable design subject to suitably worded conditions. Please note that it is only upon receipt of the updated information that an acceptable SuDS (drainage) strategy in accordance with national and local policy has been provided. The previous submitted information was not acceptable.

Suggested condition

No development shall take place until details of sustainable drainage measures to manage surface water within the site have been submitted to and approved in writing by the Local Planning Authority.

These details shall:

a) *Incorporate the implementation of Sustainable Drainage methods (SuDS) in accordance with the submitted drainage strategy version 2 April 25, Non-Statutory Technical Standards for SuDS (2015), the SuDS Manual C753 (2015) and the WBC SuDS Supplementary Planning Document (2018) with particular emphasis on Green SuDS that provide environmental/biodiversity benefits and water re-use.*

b) *Include a drainage strategy for surface water run-off within the site since no discharge of surface water from the site will be accepted into the public system by the Lead Local Flood Authority.*

c) *Provide exceedance details demonstrating that there is no risk of water leaving the site.*

d) *Ensure that design is informed by a suitable infiltration assessment demonstrating feasibility. If in an area at risk of flooding, or with high groundwater levels include and be informed by a ground investigation survey which establishes the soil characteristics, infiltration rate and groundwater levels. Soakage testing shall be undertaken in accordance with BRE365 methodology.*

e) *Provide evidence that the SuDS system will not increase flood risk to the site or adjacent properties via suitable calculations. Include infiltration and storage capacity calculations for the proposed SuDS measures based on a 1 in 100-year storm +40% for climate change. If not achievable, evidence must be provided, and a suitable alternative proposal must be agreed with the LLFA.*

f) *Provide a Maintenance and operation plan for the proposed drainage system over its lifetime clearly identifying who is responsible for ongoing maintenance of all site drainage systems (surface water and foul).*

g) *Include details of how surface water will be managed and contained within the site during construction works to prevent silt migration and pollution of watercourses, highway drainage and land either on or adjacent to the site.*

h) *Timetable for the implementation of the drainage strategy*

The above sustainable drainage measures shall be implemented in accordance with the approved details within 6 months unless agreed in writing with the Local Planning authority.

The sustainable drainage measures shall be maintained and managed in accordance with the approved details thereafter.

Reason: *To ensure that surface water will be managed in a sustainable manner; to prevent the increased risk of flooding; to improve and protect water quality, habitat and amenity and ensure future maintenance of the surface water drainage system can be, and is carried out in an appropriate and efficient manner. This condition is applied in accordance with the National Planning Policy Framework, Planning Practice Guidance, Policy CS16 of the West Berkshire Core Strategy (2006-2026), Part 4 of Supplementary Planning Document Quality Design (2006) and SuDS Supplementary Planning Document (2018). A pre-condition is necessary because insufficient detailed information accompanies the application; sustainable drainage measures may require work to be undertaken throughout the construction phase and so it is necessary to approve these details before any development takes place.*