

Dear Mr Crowther,

Unfortunately, the more I interrogate the data, the more questions arise, particularly in relation to the infiltration testing and the resultant resilience of the drainage system designed on the basis of those results. This has necessitated a further email.

For the avoidance of doubt, this is, again, neither in support of nor in opposition to the application. It is a presentation of data and known facts, drawn from and referenced against the material submitted with the application, and invites questions as to the reliability of the testing and the suitability of the proposals.

This is over and above previous correspondence, which has already asked how, when the Management Plan¹ explicitly states at 2.4.4 that “**no flooding is allowed**”, the drainage model nevertheless contains pipes identified as **FLOOD** and **FLOOD RISK**. That concern is compounded by both the FoS 1.5 and FoS 5 data, and by the scenario which shows the basin to be in deficit by approximately 103 m³.

Infiltration Testing

I will start though, with the previously voiced concerns in relation to the 12-day gap in testing for three of the four trial pits.

The drainage design proposed is based on the infiltration testing conducted in April 2025. The results of this are:

Trial pit	Test 1 (m/s)	Test 2 (m/s)	Test 3 (m/s)	Slowest (m/s)
TP01	0.0000189	0.00000952	0.000016	0.00000952
TP02	0.000144	0.000109	0.0000514	0.0000514
TP03	0.0000159	0.0000121	0.00000813	0.00000813
TP04	0.0000278	0.0000187	0.0000197	0.0000187

Table 1 Infiltration rates as recorded by Southern Testing -

For ease of reference, the colours in Table 1 relate directly to those in Figure 1 below.

From this table, it is clear from the applicant's proposal that the minimum infiltration rate of 0.00000813 m/s has been selected as the basis of the design.

However, the dates of these tests, as mentioned previously, are significant.

The tests, as per the documents provided with this application, were dated as follows:

Test dates:	Test 1	Test 2	Test 3
TP01,03 and 04	10/04/2025	10/04/2025	22/04/2025
TP02	10/04/2025	10/04/2025	10/04/2025

Table 2 Dates of infiltration testing as recorded by Southern Testing

¹

https://www1.arun.gov.uk/aplanning/OcellaWeb/viewDocument?file=dv_pl_files%5CA_44_26_PL%5C21-254-01D+Drainage+Maintenance+and+Management+Plan.pdf&module=pl

Only the testing on TP02 was compliant with BRE 365. However, TP02 cannot validate the design infiltration rate, as the rate adopted in the drainage design was derived from TP03. There is something extremely interesting that stems from the analysis of these two tables, and is best illustrated in the following graph:

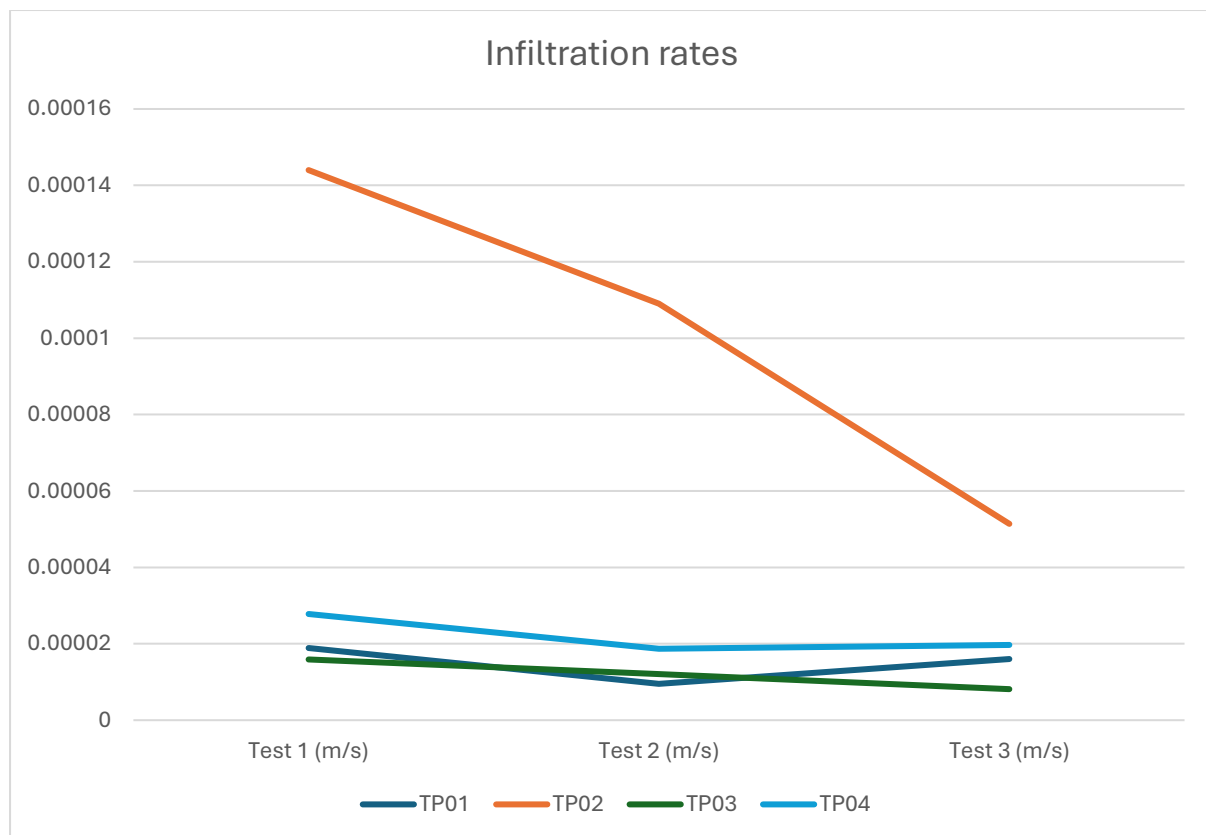


Figure 1 Infiltration rates as recorded by Southern Testing

Compliance with BRE 365

As evidenced above, the testing at TP02 was the only testing which complied with both BRE 365² and ADC's own requirements³ in that all three tests were carried out in quick succession, and in fact were on the same day. The graph therefore provides a singular, site-specific indication of the effect of successive saturation: at TP02, the measured infiltration rate deteriorated by 52.8% between tests two and three.

For the tests that were not conducted in accordance with the published requirements, the intervening periods allowed the ground an opportunity to recover before the third test was undertaken. As is evident from the graph and tables, two of those subsequently produced a better infiltration rate in test three than in test two. Whilst it cannot be established retrospectively that recovery was the cause of that improvement, the required successive-fill sequence was not completed and the resulting third-test values therefore cannot demonstrate how those trial pits would have behaved under continued successive saturation.

A correctly completed three-fill test demonstrating a reduction of more than 50% between the second and third successive fills provides direct, site-specific evidence that the infiltration

² <https://bregroup.com/store/bookshop/soakaway-design-dg-365-2016-download>

³ <https://www.arun.gov.uk/infiltration-testing>

characteristics of the material can deteriorate materially under the successive saturation regime that BRE 365 is intended to test. Where the other trial pits were excavated within comparable ground conditions, it is therefore reasonable to consider that successive filling may also have materially affected their measured infiltration rates. It is not, however, possible to determine either the direction or magnitude of that effect retrospectively, because the prescribed third successive fills were not carried out.

Sensitivity Analysis

That said, in order to illustrate the potential significance of the omitted successive testing, I have applied the 52.8% deterioration observed at TP02 to the other trial pits as a sensitivity exercise. The resulting figures are not presented as reconstructed test results, nor as evidence that the other pits would necessarily have exhibited the same deterioration. They provide an indicative infiltration rate showing the potential effect had those pits behaved in a manner comparable to the only fully compliant three-fill sequence undertaken on the site.

Trial pit	Test 1 (m/s)	Test 2 (m/s)	Extrapolated
TP01	0.0000189	0.00000952	0.000004489
TP02	0.000144	0.000109	0.000051400
TP03	0.0000159	0.0000121	0.000005706
TP04	0.0000278	0.0000187	0.000008818

Table 3 Extrapolated infiltration rates

Given that the worst rate must be used, this provides an indicative rate of 4.49×10^{-6} which is almost half the rate used.

Effect on Drainage Capacity

Referring to my previous analysis dated 27 June 2026, this significantly affects the surplus/deficit situation on site in the case of the 100-year + cc storm:

Duration	Rainfall volume	SA1 infiltration during storm	Storage needed	SA1 storage	Outside-SA1 storage needed	Outside-SA1 available	Surplus / deficit
6 hr	832.322 m ³	54.451 m ³	777.871 m ³	517.936 m ³	259.935 m ³	217.224 m ³	-42.711 m ³
12 hr	951.061 m ³	108.903 m ³	842.158 m ³	517.936 m ³	324.222 m ³	217.224 m ³	-106.998 m ³
24 hr	1072.683 m ³	217.806 m ³	854.877 m ³	517.936 m ³	336.941 m ³	217.224 m ³	-119.717 m ³

Table 4 Analysis of surplus/deficit in 100 yr + cc storm

This demonstrates that, using an indicative sensitivity value of 4.49×10^{-6} m/s, derived by applying the deterioration observed in the compliant TP02 sequence, all three storm scenarios result in a storage deficit. On that sensitivity basis, the proposed design would therefore appear

unable to contain the calculated runoff volumes and would result in physical flooding on site in each of the three modelled scenarios.

Trial Pit Dimensions

It is also noted that three of the four trial pits were wider than the maximum dimension specified by BRE 365: one was 5% wider and two were 10% wider than the prescribed maximum. This represents a further departure from the stated testing methodology and raises additional questions as to the strict compliance and reliability of the testing undertaken.

The failure of ADC to address the non-compliance of the testing submitted with this application, where it was rejected previously, and the seemingly nonchalant attitude as to the effect this may have on the residents, in my view, seriously calls into question the integrity of those assessing this application.

Reliability of the Adopted Infiltration Rate

I have previously questioned a number of times the acceptance of this testing. This document further illustrates the material effect that the failure to follow BRE 365 may have had on the derived infiltration rate. It beggars belief that everyone involved in the drainage assessment for this site knows what BRE 365 requires and yet appears content to accept significantly over-optimistic values notwithstanding the potentially serious long-term consequences for residents.

Construction of SA1

Unfortunately, the trial pit logs produced by Southern Testing, and submitted with this application, appear to show something else which is of significant concern.

Let us consider the proposals for SA1 that have preceded this particular application, viz, the drawing which the applicant has presented as representing what was actually constructed on site:

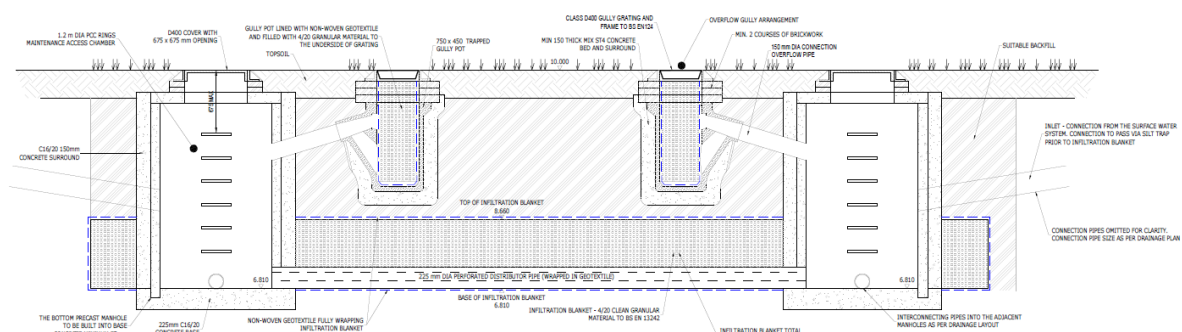


Figure 2 Extract from submitted drawings

This shows, clearly, a ground level of 10.000m AOD, an invert of 6.810m AOD and the top of the infiltration blanket at 8.660m AOD. This shows that the infiltration blanket should be encountered at 1.340 metres below the surface, and the membrane at the invert should be 3.190 metres below ground.

Trial Pit Evidence

Referring directly to the logs of the trial pits which were excavated through SA1 we have the following:

			Depth Below Ground					
Drawing	21-254-502C	SA1	AOD	SA1	TP01	TP02	TP03	TP04
Ground level			10.000					
Top of infiltration blanket			8.660	1.340	1.700	2.000	2.000	1.500
Invert level			6.810	3.190	2.550	2.500	2.500	2.500

Table 5 Layer depths from trial pits.

Note: The inferred invert depths for TP01–TP04 are based upon the changes in material layers recorded within the respective trial pit logs, there being no membrane recorded which could otherwise have provided a clear physical delimiter.

These logs all appear to indicate that SA1 was never constructed to the depth shown on the submitted drawing. It is also concerning that TP02 records membrane only at the invert, whilst TP03 records no membrane at all.

Infiltration Blanket Thickness

This also appears to imply that the infiltration blanket's thickness is as follows:

Note: Values in meters	TP01	TP02	TP03	TP04
Implied thickness	0.850	0.500	0.500	1.000
Designed thickness	1.850	1.850	1.850	1.850
Deficit	-1.000	-1.350	-1.350	-0.850

Table 6 Infiltration blanket thicknesses

Consequences of the Apparent Discrepancies

This means that, even had the earlier applications been approved, the soakaway as constructed would not have delivered the drainage system presented in the submitted drawings, with the resulting effect upon its long-term performance remaining unknown and the associated risk ultimately borne by the residents.

That, in turn, raises a serious question as to how the Council can now be satisfied that any remedial solution approved under the present application will actually be constructed in accordance with the submitted design. Given the apparent discrepancy between the previous drawings and what the trial pit logs indicate was constructed on site, residents require clear reassurance from the Council as to what inspection, verification and monitoring arrangements will be put in place to ensure that any approved works are implemented correctly.

Current Proposed Levels

Out of interest, and referencing the proposed levels under application 7, it would appear that the invert of SA1 should now be 2.930 metres below ground, so the existing SA1 is still not deep enough, even if we discount the presence of foreign materials contrary to the specification.

Outstanding Concerns

The designers know that the infiltration tests were not compliant, yet use the value anyway. The applicant knows that these tests were not compliant, yet submits them regardless. The Council knows that these tests were not compliant, yet, having previously rejected them for this exact reason, now seemingly accepts them without any justification for the change in position.

There are far too many issues arising from this to raise here, but integrity is the largest of these.

Please could the Council identify, specifically, how each of these anomalies are to be addressed?

Dr Tym Huckin BSc(Hons) FIAP MBCS