
Project Name : Sea Road, Rustington

Job No : 25-043

Note Title : Drainage Technical Note

Author : AK

Checked : BAC

Approved : BAC

Date : August 2025

1.0 INTRODUCTION

1.1 *Preamble*

1.1.1 This Drainage Technical Note has been prepared by Odyssey on behalf of Macar Homes (Rustington) Limited to summarise drainage strategy proposals for the redevelopment of the site for the construction of 26 new residential dwellings and refurbishment of seven existing buildings to provide 33 dwellings in total.

1.1.2 This note will support submission of documents aiming at addressing outstanding comments relating to the drainage condition discharge application ref: R/20/24/DOC.

1.2 *Site Location*

1.2.1 The site is located in the village of Rustington, a small seaside settlement located in the south of the Arun District. The main access to the site is gained via Sea Road.

2.0 SITE INVESTIGATION

2.1 *Percolation Tests*

2.1.1 There were five separate percolation test sets undertaken on site and the reports on these tests are listed below:



- 1) LEAP Environmental report ref: PM/25/3750892/R1, dated 13/05/2025
- 2) LEAP Environmental report ref: LP3667/PH3, dated 25/06/2024
- 3) Ashdown Site Investigation Ltd report ref: 15484/R15157, dated 04/02/2022
- 4) Contaminated Land Solutions report ref: 1318-P2GE-1, dated 06/04/2018
- 5) Geo-Environmental Services Ltd report ref: GE16334/JT01/180228, dated 18/02/2018

2.1.2 Based on the results contained in the above reports it was concluded that certain parts of the site could successfully support infiltration techniques. Therefore, the proposed drainage strategy assumes that infiltration features would be located in suitable parts of the site and any development located in areas with poor or no infiltration would drain its surface water run-off towards the areas with suitable infiltration.

2.1.3 Only percolation tests fully in accordance with BRE 365 standard were considered as suitable and from each such location the worst infiltration rate was considered for infiltration design. Odyssey have consulted Arun District Council (ADC) in relation to the proposed infiltration rates and received a response back listing what infiltration rates should be used for the proposed infiltration features. ADC response email is attached to this note in **Appendix A**. It is worth noting that ADC response was received prior to the receipt of the latest and formal BRE365 testing report (namely LEAP Environmental report ref: PM/25/3750892/R1, dated 13/05/2025 and targeting structures PP11, PP21 and tank No.4). Therefore, infiltration rates confirmed by ADC as suitable for the design purposes would remain valid only for structures PP13, PP16 and PP17. The remaining infiltration features (namely PP11, PP21 and tank No.4) would be using a revised infiltration rates to be approved and confirmed by ADC as suitable.

2.1.4 Odyssey created drawing 25-043-SK001 (presented in **Appendix B**) that shows infiltration testing undertaken across the site together with the location and depth of the proposed infiltration features and the infiltration rate that was used to design each infiltration feature.

2.1.5 As per BRE 365 requirement infiltration features have been designed so that no part would be further than 25 m away from the nearest suitable percolation test.

2.1.6 A factor of safety (FoS) of 1.5 was applied to the base infiltration rate and is based on the table 25.2 of CIRIA C753. A FoS of 1.5 is suitable for the consequence of failure taken as 'no damage or inconvenience' and such scenario is assumed for this system for the below reasons:

- a) Infiltration design is supported by a full BRE365 testing undertaken specifically where the proposed infiltration features would be located. Furthermore, only the lowest infiltration rates were applied and therefore uncertainty of infiltration rates is mitigated.



- b) Potential spill points for the SW drainage system are located at the edge of parking spaces (namely A4 and C15) therefore the risk of access road flooding is mitigated. Please note that any water potentially escaping the SW drainage system and then flowing off-site (i.e. water potentially overwhelming the SW system during a storm event exceeding the 1 in 100 + 45% design standard) would be naturally directed towards the boating lake area that is immediately adjacent to the site at its western boundary - therefore posing no risk to dwellings on or off the site.

2.2 Groundwater monitoring

2.2.1 There are several site investigation reports (listed in section 2.1.1. above) with each reporting on the groundwater (GW) levels, however, only the Ashdown Site Investigation Ltd report ref: 15484/R15157 provides a continuous GW monitoring data over the autumn/winter period between 24th Sep 2021 and 25th Jan 2022. The highest GW levels were recorded between 1.61 m AOD (WS07) and 1.88 m AOD (WS16).

2.2.2 As per good design practice the aim and requirement is to set base of infiltration features a minimum of 1 m above the highest recorded GW level.

2.2.3 The proposed infiltration features would have their base set at a level of between 2.81 m AOD and 2.95 m AOD which would provide the 1 m unsaturated zone between base of infiltration and GW level recorded in the nearby test locations.

2.2.4 Infiltration tank No.4 would be located between four GW monitoring locations, namely WS07, WS11, BH2 and BH3 (please refer to drawing 25-043-SK001 presented in **Appendix B**). The highest GW level was recorded in BH2 at 2.06 m AOD. The second highest GW level (amongst these four locations) was recorded in WS11 at 1.82 m AOD. As the natural ground has a gradient and falls from BH2 towards WS11 it is assumed that the GW levels would also follow a hydraulic gradient and as such the GW level (interpolated between BH2 and WS11) is assumed to be at approximately 1.94 m AOD at the location of infiltration tank No.4. With (interpolated) GW at 1.94 m AOD and tank base set at 2.95 m AOD there would be a minimum of 1 m of unsaturated soil between.

2.2.5 However, based on the highest GW in BH2 at 2.06 m AOD the infiltration tank No.4 set at 2.95 m AOD would still provide 0.89 m of unsaturated soil in around BH2 location. Considering that infiltration tank No.4 would act as an off-line tank and any water entering it would be already filtered through the surface of the permeable paving and/or granular sub-base material of the permeable paving the risk of contamination to the GW would be mitigated and the requirement of 1m of unsaturated soil could be relaxed in this particular case.

APPENDIX A

Arun DC Correspondence

Arek Kadlec

From: Sarah Burrow <Sarah.Burrow@arun.gov.uk>
Sent: 24 April, 2025 10:10 AM
To: Arek Kadlec; Karl Mclaughlin
Cc: Brian Chamberlain; david.lawn@macar.co.uk
Subject: RE: Convalescent Home, Sea Road, Rustington - R/20/24/DOC and ADC/EXT2/D2134/40

Hi Arek,

I had put this to a consultant a couple of days ago, so it is serendipitous that you emailed. I received his response yesterday, I quote as follows:

“I have reviewed SK001 Rev B, noting the presentation of this drawing differs to the last issue. All testing data is annotated; however, the light grey text needs to be clearer.

Noting the geology and differing results, a more cautious approach is recommended; I have suggested the following approach:

- Tank 4, PP 11 & Tank 5 to use worst case of 0.02173m/h.
- PP 16 & 17 to use worst case of 0.1135m/h.
- PP 13 yields a significantly higher rate not replicated anywhere else, therefore suggest using worst case of 0.1135m/h to match the other PP's.

Noting 3 No tests were completed to BRE365 at each location and the above approach for design rates, no further safety factor need to applied to the calcs.”

Kind regards

Sarah Burrow
Flood Risk and Drainage Engineer, Coastal Engineers and Flood Prevention

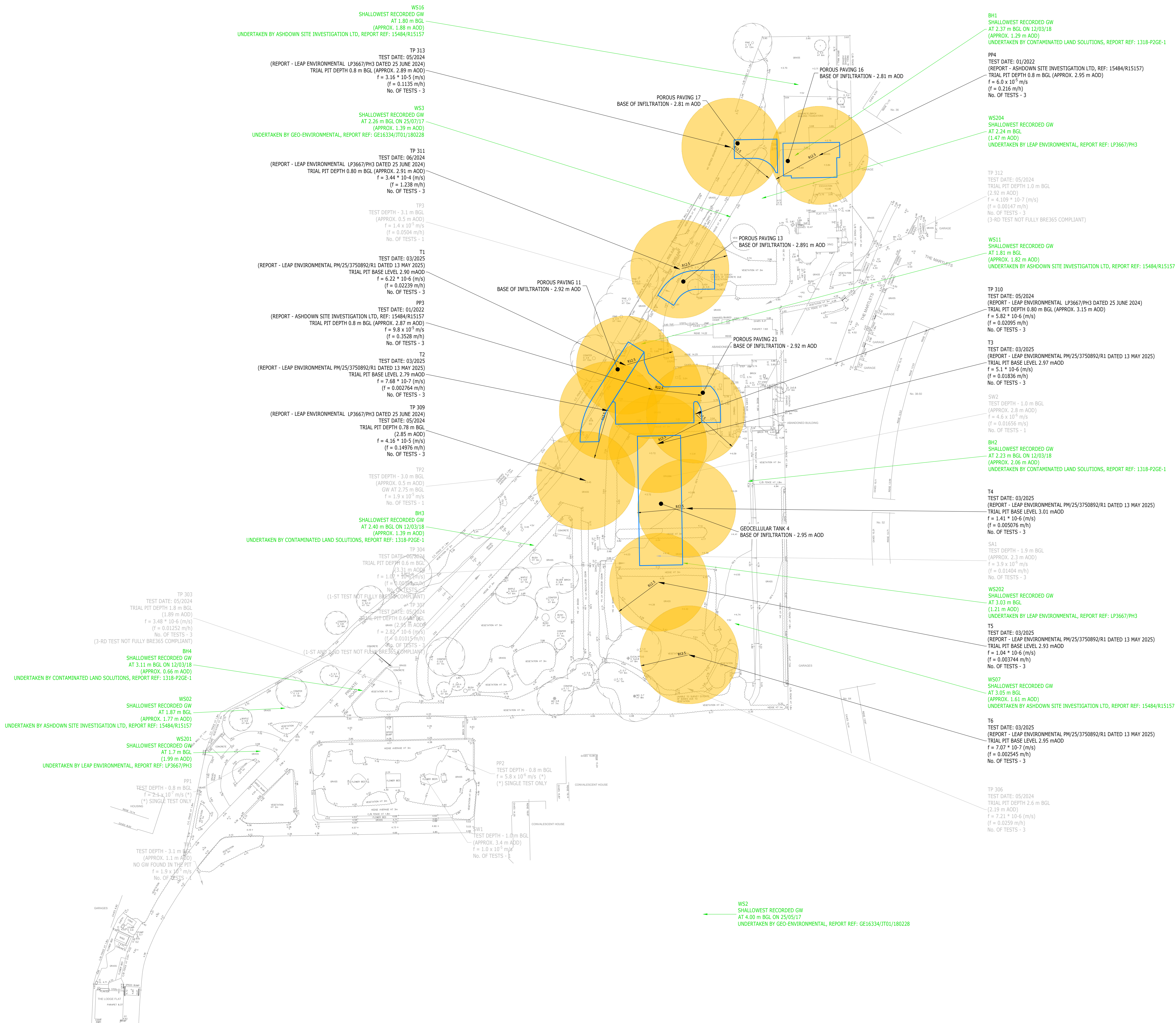
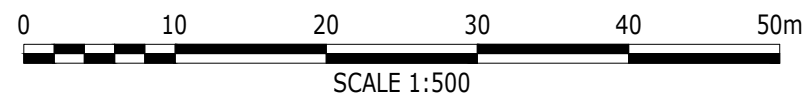
T: 01903 737815
E: sarah.burrow@arun.gov.uk
M: 07733 125764

Arun District Council, Civic Centre, Maltravers Rd
Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

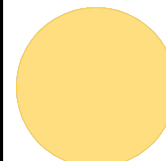


APPENDIX B

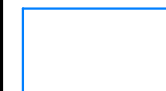
Drawing 25-043-SK001



1. PROPOSED INFILTRATION RATES :
 - a. GEOCELLULAR TANK 4 - 0.00374 m/h (AS PER TS)
 - b. POROUS PAVING 11 - 0.002764 m/h (AS PER T2)
 - c. POROUS PAVING 13 - 0.1135 m/h - AS PER ARUN CD ADVICE
 - d. POROUS PAVING 16 - 0.1135 m/h - AS PER ARUN CD ADVICE
 - e. POROUS PAVING 17 - 0.1135 m/h - AS PER ARUN CD ADVICE
 - f. POROUS PAVING 21 - 0.002764 m/h (AS PER T2)
2. FACTOR OF SAFETY (FOS) APPLIED TO BASE INFILTRATION. FOS = 1.5 - AS PER TABLE 25.2 OF CIRIA C773. CONSEQUENCE OF FAILURE TAKEN AS NO DAMAGE OR INCONVENIENCE FOR THE BELOW REASONS:
 - DESIGN IS SUPPORTED BY A FULL BRE365 TESTING UNDERTAKEN SPECIFICALLY WHERE THE PROPOSED INFILTRATION FEATURES WOULD BE LOCATED. FURTHERMORE, ONLY THE LOWEST INFILTRATION RATES WERE APPLIED - AS PER ARUN CD COMMENTS. UNCERTAINTY OF INFILTRATION RATES IS THEREFORE ENTIRELY MITIGATED.
 - SPILL POINTS FOR THE SW DRAINAGE SYSTEM ARE LOCATED AT THE EDGE OF PARKING SPACES (NAMELY A AND C15) THEREFORE THE RISK OF ACCESS ROAD FLOODING IS MITIGATED. EASEMENT FOR WATER ESCAPE IN SW DRAINAGE SYSTEM AND THEN FLOWING OUTSIDE (I.E. WATER POTENTIALLY OVERWHELMING THE SW SYSTEM DURING A STORM EVENT EXCEEDING THE 1 IN 100 + 65% DESIGN STANDARD) WOULD BE NATURALLY DIRECTED TOWARDS THE BOATING LAKE AREA THAT IS IMMEDIATELY ADJACENT TO THE SITE AT ITS WESTERN BOUNDARY - THEREFORE POSING NO RISK TO DWELLINGS ON OR OFF THE SITE.
3. GREEN NOTES REFER TO THE GROUND WATER (GW) LEVELS MONITORING.
4. GREY NOTES REFER TO INFILTRATION TESTS THAT DID NOT MEET THE BRE365 REQUIREMENTS IN FULL AND THUS WERE NOT CONSIDERED FOR THE INFILTRATION FEATURES DESIGN.



AREA INDICATING A 12.5m RADIUS AWAY FROM
THE CENTRE OF THE BRE 365 TESTING LOCATION



INDICATIVE OUTLINE OF THE PROPOSED INFILTRATION FEATURES

[illegible]

Job Title

CONVALESCENT HOME
SEA ROAD, RUSTINGTON

Drawing Title

SITE INVESTIGATION AND
INFILTRATION FEATURES

Client
MACAR HOMES (RUSTINGTON) LTD

Scale 1:500 @A1	Date FEB 25	Designed AK
Drawn AK	Checked BAC	Approved BAC
Job No 25-043	Drawing No 25-043-SK001	Rev D