

4.0 Soakage Test Results

- 4.1 Large scale soakage tests were conducted within pits TP101 to TP104 in accordance with an abridged version of BRE 365. A summary of the soakage test results is presented in the table below:

Trial Pit	Pit Dimensions LxWxD (metres)	Water Level at start of test (mm below ground level)	Duration of test (mins)	Fall of water level during test (mm)	Infiltration Coefficient (m/s) (see note)
TP101	0.35 x 1.1 x 1.1	225	380	270	1.0×10^{-6}
TP102	0.35 x 2.0 x 2.0	460	337	370	1.1×10^{-6}
TP103	0.35 x 1.7 x 1.5	450	195	460	5.9×10^{-6}
TP104	0.35 x 1.6 x 2.0	1010	38	990	8.9×10^{-5}

Note: The tests were undertaken on 2 August 2017 and after a dry start, from about 10am onwards there was persistent rain, heavy at times. This may have had an influence on the tests and the results presented above could represent under estimates of the infiltration coefficients.

Handwritten note: All workable + compacted with South Coastal plain.

- 4.2 The testing within trial pit TP103 represents a test in natural undisturbed soils. It is noted that the natural soils vary across the site and the infiltration characteristics should also be expected to vary.
- 4.3 The remainder of the pits, TP101, TP102 and TP104, were within Made Ground or reworked natural soils. The range of results reflects the variability of permeability within the Made Ground resulting from variation in composition and state of compaction.

5.0 Anecdotal Information

- 5.1 The Client has been advised by neighbours that their gardens flood when there is heavy rain. Further enquiries would be necessary to gather all information that would be available from such sources to establish if this is indicative of poor infiltration or elevated groundwater levels (the latter would typically result in flooding for longer periods of time).
- 5.2 The observations of flooding or the absence of flooding in the low lying neighbouring gardens may provide useful information on the seasonal fluctuation of the groundwater in the vicinity of the site. Additional topographic survey is required but based on the boundary levels recorded on the site survey the general site level is elevated by between 1.1 and 1.7m.

6.0 Discussion and Recommendations

- 6.1 It will be necessary to consult with Arun District Council to determine the period of monitoring required to support the design.
- 6.2 Arun District Council should also be contacted for further information on drainage in the area as the Environment Agency mentioned there may have been some issues with SUDS schemes on recent developments. It is understood the Client may have made some enquiries.
- 6.3 In assessing the infiltration capacity of the natural soils that underlie the made ground beneath the site it is noted that:
- the permeability of the made ground is expected to be highly variable and as demonstrated by the soakage test in TP104, may in places be relatively high (8.9×10^{-5} m/s).
 - based on the results of the testing an infiltration coefficient range of 1.0×10^{-6} to 5.9×10^{-6} m/s is considered appropriate for design of infiltration into the natural soils and reworked natural soils. (as noted this is possibly an under estimate due to the influence of rainfall during the testing).
 - the investigation did not encounter any heavy clay layers beneath the site or any strata with significant reduction of apparent permeability below that assumed for natural soils (soils below a depth of 2m have not been tested).
 - the groundwater monitoring to date has indicated that the response of the shallow standpipes is similar to that of the deeper installation indicating the water that infiltrates the ground does not remain perched in the superficial deposits
 - the rate of infiltration into the boreholes indicates a significant increase in permeability within the underlying chalk
 - by reference to local Ordnance Survey mapping it is noted that there are no surface watercourses in the vicinity of the site or between the site and the River Arun 2km to the east / northeast indicating that surface water tends to infiltrate the ground rather than runoff to ditches
 - The development offers an opportunity to increase the efficiency that surface water enters the ground
- 6.4 The installation of infiltration drainage will need to consider the presence of contamination and avoid increasing the mobilisation of contaminants into the groundwater. The detailed design of the scheme should be discussed and agreed with the Environment Agency who have been asked to comment on the findings of the Phase 2 Investigation and an initial assessment (they previously indicated an acceptance of dispersed infiltration such as associated with permeable paving and soft landscaped areas). It is recommended that a cost allowance is made for remediation / replacement of contaminated soils in the vicinity of soakaways that will concentrate flows into the ground.
-