The Holme and The Homestal

Preliminary Ground Investigation Report

December 2025

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Parkside, One Horton Heath, Hampshire

Preliminary Ground Investigation Report

December 2025

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1 Introduction

1.1 Preamble

1.1.1 Stantec UK LTD (Stantec) has been commissioned by Eastleigh Borough Council (the Client) to prepare a Ground Investigation Report in relation to the ground conditions required to support the drainage strategy for the Parkside area (the Site) as part of the wider One Horton Heath Development.

1.2 Background

1.2.1 The Parkside area of the wider One Horton Heath Development comprised three development parcels, named The Homestal, The Folds and The Holme, located in the west, east and south, respectively.

1.2.2 A site location plan is included as **Figure 1** whilst the layout of the site is shown on the Exploratory Hole Location Plan included as **Figure 2**.

1.2.3 Several previous phases of ground investigation and reporting have been undertaken across the Parkside area between 2019 and 2023. The list of relevant reports are summarised below:

- Hydrock (2019) Horton Heath, Hampshire: Desk Study Assessment HHD-HYD-XX-XX-RP-GE-0001 (HY, 2019a).
- Hydrock (2019) Horton Heath, Hampshire: Ground Investigation Report HHD-HYD-XX-XX-RP-GE-0002 (HY, 2019b).
- Ridge and Partners LLP (2023) Geotechnical Investigation Report: One Horton Heath. 5019962-RDG-XX-ST-DOC-C-00GIR01 (RD, 2023).

1.2.4 It is noted that the available historical ground investigation information is predominately focused on the southern Parkside area, specifically The Holme, with limited investigation data available for the northern areas, The Homestal and The Folds.

1.2.5 It is understood that a detailed surface water drainage scheme is going to be presented as part of the Minerals Resource Assessment (RMA) applications for the Parkside area. This report aims to provide further ground and hydrogeological information to assist, alongside the available historical information, required to support the RMA submission for the Parkside area. The RMA boundaries are presented on drawing **STA-ZZ-DR-L-003**.

1.3 Scope of Work

1.3.1 The scope of works performed by Stantec comprises the preparation of a Ground Investigation Report in general accordance with the requirements of BS EN 1997-2 (2007). The Ground Investigation Report summarises the findings of the intrusive work, presents an assessment of the ground conditions, infiltration testing, groundwater monitoring, and provides recommendations in relation to the proposed drainage design.

1.4 Proposed Development

1.4.1 The proposed development across the Site, comprise residential properties, soft landscaping, new roads and five attenuation basins required to accommodate the surface water drainage for the development. Two basins are proposed in the north of The Homestal and The Folds, a third basin is proposed in the southeast of The Folds, with the final two basins proposed in the south of The Holme. It is expected that the proposed basins will be constructed to a depth of approximately between 1.0m to 1.5m below existing ground level (bgl). Drawing **STA-ZZ-ZZ-DR-L-2000**, appended to this report, includes the locations of the proposed drainage basins.

1.5 Limitations

1.5.1 Unless stated otherwise, information from the ground investigations undertaken outside of the Parkside Site has not been included in this report and, where referenced, the reports presenting this information should be read in conjunction with this report. Except where noted, Stantec has not been involved in the supervision and technical direction of the previous studies and investigations undertaken at the Site and accepts no responsible for the accuracy and completeness of the data.

1.5.2 Guidance on the context of this report and any general limitations or constraints on its content and usage are given in a separate guidance note included after the text of this report.

2 The Site and Geological Setting

2.1 Site Location

2.1.1 The Parkside Site is located within the wider One Horton Heath development, immediately west of Horton Heath, Hampshire. The approximate centre of the Site is located at National Grid Coordinates SU 488 174. The Site is currently accessed off Fire Tree Lane which separates the two parcels in the northern part of the site (The Homestal and The Folds) from the southern parcel (The Holme).

2.2 Site Description

2.2.1 The Site is currently occupied by open fields, predominately used for arable farming. The eastern area of The Holme is associated with unfarmed scrubland. Each of the three parcels are typically bounded by mature hedgerows with a section of woodland along the north and south of the Site.

2.2.2 The ground level across the Site typically falls from the centre of the Site at 30.0m above Ordnance Datum (OD) towards the Site boundaries, where ground levels around circa 23.0m OD.

2.3 Site History

2.3.1 The wider One Horton Heath development history was summarised within the previous Phase 1 Desk Study Report (HY, 2019a). The report noted that the Site has remained relatively unchanged since 1868 with an area of allotment gardens adjacent to the southeastern corner of The Folds and Foxholes Farm adjacent to the east of The Holme, first mapped in 1868. Foxholes Farm has recently, post 2018, been demolished. Fire Tree Farm was first mapped in 1868 adjacent to the south west of The Homestal and is understood to remain in a residential use.

2.3.2 The wider surrounding areas is associated with woodland and farmland with the town of Horton Heath present east of the Site.

2.4 Geological Setting

2.4.1 The Site is underlain by the Wittering Formation bedrock soils (BGS, 1987 Sheet 315), described by the British Geological Society (BGS, 2025 geoindex) as a greyish brown laminated and interbreed clay and fine to medium grained sparsely glauconitic sand.

2.4.2 Superficial Deposits are not recorded on site, however, a limited extent of Alluvium is recorded as bordering the immediate north and south of the site associated with unnamed tributaries which flow east to west, towards the River Itchen, approximately 1.8km west of the Site. The Alluvium is typically described as a soft to firm compressible silt and clay which can contain layers and partings of sand, peat and gravel.

2.5 Hydrogeological Setting

2.5.1 The Wittering Formation is classified by the Environment agency (EA) as a Secondary A Aquifer (HY, 2019a), permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

2.5.2 The Site is not located within a source protection zone and there are no records of groundwater abstraction within 1km of the Site (HY, 2019a).

3 Ground Investigations

3.1 Previous Ground Investigations

3.1.1 The Site has previously undergone two phases of ground investigation. The first phase of ground investigation was carried out in 2019 by Hydrock Ltd (now part of Stantec) (HY, 2019b) and the second was carried out in 2023 by Ridge and Partners LLP (RD, 2023).

3.1.2 A summary of both phases of investigation is outlined in the section below.

Hydrock 2019

3.1.3 The 2019 ground investigation was carried out across the wider site. The ground investigation included the drilling of two boreholes within the Site; one in The Homestal and one in The Folds.

3.1.4 The two boreholes denoted BH06 and BH07 were drilled to a depth of 8.0m and 8.1m below ground level (bgl). Each of the boreholes was fitted with groundwater monitoring well.

3.1.5 The boreholes recorded between 0.4m and 0.5m of topsoil overlying up to 0.9m of Head Deposits overlying the Wittering Formation, comprise predominately sandy silt with layers of laminated sand. The Head Deposits in was described as orange, brown silty sand or sandy silt. Given the material record as Head Deposits on exploratory hole logs is very similar to the Wittering Formation this has been considered as the Wittering Formation for the purpose of this report.

3.1.6 Groundwater was not recorded during the drilling of the boreholes. Post fieldworks groundwater monitoring carried out in November 2018 recorded water at depths of between 1.95m and 3.04m bgl corresponding to reduced elevation of between 15.9m and 19.6m OD.

3.1.7 Two falling head tests were undertaken during drilling of borehole BH07. The first test was undertaken between 2.5m and 3.0m bgl, with the second undertaken between 3.5m and 8.0m bgl. The first test did not record any change in water level over the one hour test period. The water level has fallen 0.08m over one hour during the second test. Both tests were completed within cohesive portions of the Wittering Formation.

3.1.8 A suite of geotechnical testing was undertaken on samples recovered during the investigation. The tests comprised 4No. particle size distribution (PSDs), 4No. moisture contents, 4No. Atterberg Limits, 1No. compaction testing and 1No. quick undrained triaxial test.

Ridge 2023

3.1.9 The 2023 investigation comprised the excavation of 14 no. trial pits, 11 no. across The Holme with 1 no. excavated in the north of The Homestal and 2 no. across the north and southeast of The Folds. Infiltration testing was carried out in 5 no. of the trial pit, targeting areas of proposed attenuation basins.

3.1.10 The 5 no. trial pits with infiltration testing were excavated to 2.5m bgl with the infiltration testing undertaken between 0.5m to 1.5m bgl to the base of the trial pit. The maximum test duration was 21 hours, with none of the tests having drained past the 75% or 25% head of water line as suggested in BRE 365 (BRE, 2016) in order to estimate infiltration rates.

3.1.11 The 9 no. remaining trial pits were excavated to a maximum depth of 1m bgl. The ground conditions recorded during the investigation recorded up to approximately 0.5m of topsoil overlying the Wittering Formation to the base of the exploratory hole.

3.1.12 A total of 5 no. boreholes were drilled alongside each soakaway to allow for installation of a monitoring well to a depth of 2.5m bgl required to allow for groundwater monitoring post

completion of the intrusive fieldworks. Exploratory hole records for the shallow boreholes were not included in the factual report for the investigation.

3.1.13 Groundwater monitoring was undertaken in the wells over six monitoring visits carried out between November 2022 and March 2023. The results of the groundwater monitoring are summarised below:

Table 3.1 Summary of Groundwater Monitoring result in the Ridge Investigation.

Location	Groundwater depth (m bgl)	Groundwater Elevation (m OD)	Comments
SA07	0.1 to 1.0	21.2 to 20.3	Shallowest level recorded in February
SA08	0.0 to 0.6	19.8 to 19.2	Shallowest level recorded in January
SA09	0.1 to 0.5	26.8 to 26.4	Shallowest level recorded in January
SA10	0.6 to dry (2.3)	21.8 to 20.0	Shallowest level recorded in March
SA11	0.3 to dry (2.3)	23.2 to 21.0	Shallowest level recorded in February

3.1.14 A suite of geotechnical testing was undertaken on samples recovered during the investigation. The geotechnical testing comprised 9No. Particle Size Distributions, 10No. moisture contents, 10No. Atterberg Limits, 17No. California Bearing Ratio (CBR), 9No. compaction testing and 5No. Moisture Condition Values (MCVs).

3.2 Recent Ground Investigation

3.2.1 Following a review of the existing ground investigation information available for the Parkside site, it was decided that further ground investigation was required to fill in the data gaps for the Parkside Site, in particular for the 'The Folds' and 'The Homestal' parcels of the development.

3.2.2 The ground conditions on the site have been investigated by an intrusive ground investigation to provide information for the development of the Site including the proposed drainage basins. The scope of works is summarised in the following sections of this report. The factual results of the investigation are presented in a separate report prepared by Stantec UK (STA, 2025) which should be read in conjunction with this report.

Aims of the Investigation

3.2.3 The aim of the investigation was to confirm the ground conditions within the area of Site such that informed decisions on the proposed development of the Site can be made. The principal aims of the investigation were to determine:

i. The presence and depth of any shallow groundwater in the near surface soils.

ii. Confirm the infiltration potential of the near surface soils and groundwater levels.

iii. Confirm the ground conditions to determine geotechnical parameters.

3.2.4 To satisfy the aims of the investigation, the proposed design of the ground investigation allowed for:

i. The excavation of 15 no. trial pits to maximum depths of 3.5 m bgl with the recovery of soil samples for geotechnical analysis.

ii. Infiltration testing in 4 no. trial pit locations in general accordance with BRE 365.

iii. The sinking of 4 no. boreholes to a maximum depth of 6.0 m bgl with standard penetration testing, the recovery of Class 1 soil samples, and in-situ permeability testing during drilling.

iv. The installation of a groundwater monitoring well at each borehole location required to monitor groundwater levels.

v. Geotechnical testing on selected soil samples to determine geotechnical parameters.

vi. Groundwater monitoring on a monthly basis for 8 months to include monitoring extending over the winter period.

3.3 Fieldwork

3.3.1 The fieldwork for the ground investigation was carried out between 21st and 25th July 2025 comprising the sinking of four boreholes, designated BH01 to BH04, and the excavation of 14 no. scheduled trial pits, designated TP01 to TP15, including TP05a which was completed as a separate pit for an infiltration test. TP09 and TP11 were not excavated in this phase of ground investigation.

3.3.2 The four boreholes were sunk using light cable percussion techniques to a maximum depth of 6.5m bgl by the recovery of open drive UT100 samples, disturbed small and bulk samples and standard penetration testing. Variable head testing was carried out in each of the four boreholes at between 1.0m and 6.0m bgl using an in house falling head testing method based on the Kent County Council Soakaway Guide (2001) in boreholes BH01 and BH02, and using BS EN ISO 22282 in boreholes BH03 and BH04, with a rising head test and a constant head test, respectively.

3.3.3 On completion of the boreholes, a standpipe was constructed in each borehole to allow groundwater levels and concentrations of ground gases to be monitored and samples of groundwater recovered for chemical analysis. The boreholes were backfilled and sealed with bentonite pellets below the base of the installation.

3.3.4 The trial pits were excavated using a hydraulic excavator to depths between 1.5 and 3.5m below existing ground level to obtain detailed information on the near surface soils. Infiltration tests were carried out in four of the trial pits (TP05a, TP12, TP12 and TP15) to determine the infiltration characteristics of the soils across the Parkside Site. Owing to slow infiltration rates, two of the four tests (TP12 and TP15) were terminated before the 75% volume loss was reached. The infiltration testing carried out in trial pits were terminated all after a single test owing to time limitations. Therefore, the tests undertaken were not fully compliant with the requirements of BRE (2016).

3.3.5 The records of the exploratory holes are presented in Appendix B of the factual report (STA, 2025) and their locations are shown on the Site Layout Plan, **Figure 2**.

3.4 Laboratory Testing

3.4.1 A programme of geotechnical laboratory soils testing was carried out to verify the visual identification and classification, and to determine the physical properties of selected samples of the materials encountered. The testing was schedule by Stantec and carried out in accordance with BS 1377 (1990) by i2 analytical Limited, who hold UKAS accreditation for geotechnical soil testing carried out. The results of the geotechnical testing are presented in the factual report (STA, 2025)

3.4.2 A programme of geochemical laboratory testing was carried out on selected soil samples to determine the concentrations of a range of commonly occurring potential contaminants. Samples of soil for geochemical testing were taken from the exploratory holes and samples of water were recovered from the installed standpipes. The geochemical analyses were scheduled

by Stantec and carried out by i2 analytical Limited. The geochemical analyses used methods that are accredited by MCERTS where available. The results of the geochemical analyses are presented in the factual report (STA, 2025).

3.5 Monitoring

3.5.1 A monitoring well was installed within each borehole to monitoring groundwater levels and ground gas concentrations, following completion of the intrusive works.

3.5.2 To date, monitoring has been carried out on two occasions, 7th August and 11th September, with a further six monitoring rounds to be undertaken on monthly return intervals, extending over the winter period. The monitoring results available to date are presented in the factual report (STA, 2025).

4 Ground Conditions

4.1 Stratigraphy

4.1.1 The ground conditions in the area of the site, as revealed by the previous and recent ground investigations across the Parkside site, comprises a layer of Topsoil overlying the Wittering Formation. The ground conditions area in general agreement with the published geological information and known history of the site.

4.1.2 Based on the information from the previous and recent ground investigations, the ground conditions encountered are summarised in the following table:

Table 4.1 Summary of Existing Ground Conditions

Strata	Depth to Strata, m bgl (1)	Thickness, m	Typical Description
Topsoil	Ground Level	0.30 to 1.10	Soft to firm light brown slightly sandy CLAY.
Wittering Formation (Cohesive)	0.30 to 1.10	>7.3	Soft to firm orangish brown mottled greyish brown sandy CLAY. Orangish brown to greyish brown clayey SAND.

Note 1) Denotes metre below ground level

4.1.3 Comments and the nature and extent of each stratum are presented in the following sections of this report. Where characteristic values of parameters for geotechnical design are suggested in the discussion on ground conditions below, reference should be made to terminology and definitions given in the BS EN 1997-1 (2013) and BS EN 1997-2 (2007) as appropriate.

4.2 Topsoil

4.2.1 **Description** Topsoil was encountered from ground level at each location investigated to between reported between 0.3m and 1.1m below existing ground level. Typically, the Topsoil was typically described as a soft to firm light brown slightly sandy CLAY and locally as a brown SAND with rare fine to coarse subangular and rounded flint gravel.

4.2.2 **Characteristic Values** Given the limited thickness of the Topsoil, and the expectation that this material will be removed prior to any engineering works, hence, no characteristic values are recommended.

4.3 Wittering Formation

4.3.1 **Description** Wittering Formation was encountered in all locations investigated underlying the Topsoil and was encountered as a cohesive and granular strata down to a maximum depth of 8.1m bgl.

4.3.2 There is no notable boundary between the granular and the cohesive beds with these vary both horizontally and vertically. It should be noted that a large portion of the Wittering Formation was found to behave as a predominantly cohesive soil comprising more than 30% of silt and clay with the rest of the soils behave a granular soil with circa less than 30% clay and silt. It should be note that some of the soils include borderline cohesive / granular materials. As such, the strata boundaries between the cohesive and granular soils of the Wittering Formation shown on the exploratory hole records will need to be used with caution.

4.3.3 **Classification** Results of the classification testing are presented on a Casagrande Chart on **Figure 3**, with measured values of liquid and plastic limit typically between about 33 and 70, and between 13 and 30 per cent, respectively, with corresponding modified values of plasticity index typically of 15 to 39 per cent. This indicates the material is of low to high plasticity, typically

intermediate. Measured values of moisture content are between about 14 and 37 per cent; these values reflect the variable nature and degree of saturation of the material.

4.3.4 **Material Properties** Results of particle size distribution analyses for the Wittering Formation are presented on **Figure 4** and indicate the gravel sized fraction is up to 7 per cent. The sand size fraction is between about 18 and 88 per cent. The samples tested were found to contain up to between 12 and 82 per cent fines fraction (<63 µm). The majority of the samples tested contain more than 30% fines, supporting the engineering log descriptions which typically recorded the material as predominately cohesive, with less frequent granular layers. It should be noted that the majority of the testing undertaken on the material recovered during the Ridge Investigation was recorded as a fines dominated material. However, four of the eight samples tested within the Stantec investigation were on samples of granular dominated material.

4.3.5 It should be noted that part of the fines fraction can be lost in the samples recovered using light cable percussive boring techniques hence the measured particle size distributions may not be representative of the in situ conditions.

4.3.6 **Penetration Resistance** Eight Standard Penetration Tests (SPTs) were undertaken across the granular dominated Wittering Formation soils. The results of the SPTs, normalised for overburden pressure and hammer efficiency (SPT N_{60}) ranged between 14 blows and >50 blows within the granular horizons corresponding to a loose to very dense granular soil (BS ,2020) SPT N_{60} values recorded within the cohesive horizons were recorded between 6 and 34 blows. Values of SPT N_{60} are presented on a plots vs depth as shown on **Figure 5**. It is noted that the majority of the Wittering Formation was encountered as a predominately cohesive material, as discussed in the **Section 4.4.6**.

4.3.7 **Undrained Shear Strength** Visual examination of the material indicates the material is typically firm in consistency although locally the material was described as very soft or very stiff in consistency. It is expected that the variation in noted consistency reflects the variable nature and degree of saturation of the material. Measured values of undrained shear strength of, as determined by laboratory unconsolidated undrained triaxial testing of 100 mm diameter specimens, is presented as a plot against reduced level on **Figure 6** together with values of undrained shear strength determined using an empirical correlation with SPT N values (Stroud, 1989). The measured and determined values typically increase with depth with values range typically between 40 and 120 kPa and locally between 30 to greater than 200 kPa.

4.3.8 **Compaction** Maximum dry density (MDD) vs optimum moisture content (OMC) relationship tests were carried out on samples recovered as part of all phases of investigations. The MDD for the Wittering Formation ranges from 1.61 to 1.82 Mg/m³ with corresponding OMC of between 8 and 21 per cent using a 2.5kg rammer. Samples tested using a 4.5kg rammer provided results of MDD of between 1.82 and 1.92 Mg/m³, with corresponding OMC of between 12 and 15 per cent. Natural moisture contents of the samples were recorded between 8 and 30 per cent, generally showing the material is wet of optimum.

4.4 Groundwater

4.4.1 **Groundwater Entries** During the previous ground investigation undertaken by Ridge and Hydrock, groundwater was not recorded in any of the exploratory holes within the Parkside Site. During the recent investigation undertaken by Stantec, groundwater entries were encountered in the Wittering Formation between 2.4m and 3.5m bgl. In borehole BH03 groundwater was encountered at 3.5m rising to 1.9m after 20 minutes. Groundwater was encountered in borehole BH04 at 3.0m rising to 2.8m after 20 minutes.

4.4.2 **Groundwater Levels** A single groundwater monitoring round was undertaken during the Hydrock investigation in November 2018. Groundwater was monitored in standpipes targeting the Wittering Formation, recorded between approximately 2.0m bgl (25.9m OD) and 3.0m bgl (19.6m OD), in BH06 and BH07, respectively.

4.4.3 Groundwater monitoring of standpipes installed in the Wittering Formation was undertaken by Ridge between November 2022 and March 2023 in monitoring wells SA07 to SA11, located in

the vicinity of the proposed drainage basins. A summary of the groundwater monitoring has been re-produced below as **Plate 4.1**.

Plate 4.1. Summary of Ridge 2023 groundwater monitoring (RD,2023)

		03/11/2022			06/01/2023			02/02/2023			21/02/2023			13/03/2023			30/03/2023		
		MR1			MR2			MR3			MR4			MR5			MR6		
mAOD		Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)	Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)	Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)	Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)	Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)	Depth to Water (mbgl)	Water Level (mAOD)	Depth to Base (mbgl)
21.30	SA07	1.03	20.27	2.49	0.11	21.19	2.39	0.09	21.21	2.50	0.34	20.96	2.48	0.26	21.04	2.47	0.26	21.04	2.47
19.80	SA08	0.62	19.18	2.51	0.02	19.78	2.48	0.42	19.38	2.49	0.47	19.33	2.46	0.05	19.75	2.40	0.09	19.71	2.36
26.90	SA09	0.49	26.41	2.49	0.07	26.83	2.51	0.19	26.71	2.54	0.35	26.55	2.49	0.25	26.65	2.50	0.26	26.64	2.48
22.35	SA10	Dry	20.02	2.33	0.69	21.66	2.27	0.90	21.46	2.48	0.67	21.68	2.36	0.58	21.77	2.35	0.63	21.72	2.35
23.50	SA11	Dry	21.03	2.47	0.72	22.78	2.42	1.40	22.10	2.44	0.32	23.18	2.42	0.86	22.64	2.42	0.94	22.56	2.40

4.4.4 The groundwater levels during the winter monitoring period in 2022/2023 typically recorded groundwater levels to between ground level and 1.0m bgl. Locally the groundwater levels were measured as shallow as 0.05 m bgl.

4.4.5 On completion of the recent investigation (STA, 2025); groundwater levels were monitored on two occasions between August and September 2025. Groundwater levels were recorded between 0.75 to 3.70m bgl were measured in the standpipes installed within the Wittering Formation. Additional groundwater monitoring rounds are scheduled to be completed over the winter period and will be reported during a subsequent revision to the factual report (STA, 2025).

4.5 Infiltration Testing

4.5.1 Shallow infiltration testing was carried out as part of both the 2023 investigation undertaken by Ridge and Partners LLP and the 2025 Investigation undertaken by Stantec. A total of nine tests were conducted across the Parkside Site within the Wittering Formation, five during the 2023 investigation (SA07 to SA11) and four during the 2025 investigation (TP05A, TP12 to TP13 and TP15). A summary of the shallow infiltration testing result calculated by the ground investigation contractors is presented in Table 4.2 below:

Table 4.2 Summary of Infiltration testing results

Location	Depth (m bgl)	Soil Infiltration Coefficient (m/s)	Comment
2023 Ridge and Partners LLP Investigation			
SA07	0.5 to 2.5	Not Calculated	Terminated after 21 hours due to low infiltration.
SA08	0.48 to 2.5	Not Calculated	Terminated after 21 hours due to low infiltration.
SA09	0.5 to 2.7	Not Calculated	Terminated after 6 hours due to low infiltration.
SA10	0.77 to 2.5	Not Calculated	Terminated after 6 hours due to low infiltration.
SA11	1.5 to 1.7	Not Calculated	Terminated after 6 hours due to low infiltration.
Stantec 2025 Investigation			
TP05A	0.25 to 1.5	8.84×10^{-7}	Terminated after 25 hours due to low infiltration.
TP12	0.41 to 1.35	Not Calculated	Terminated after 4.5 hours due to low infiltration.
TP13	0.28 to 1.25	3.62×10^{-6}	Terminated after 4 hours due to low infiltration.
TP15	0.46 to 1.46	Not Calculated	Terminated after 3 hours due to low infiltration.

4.5.2 It is noted that the completed tests in TP05A and TP13 were predominately undertaken across granular dominated soils in the Wittering Formation.

4.5.3 Testing undertaken across the remaining seven infiltration tests which failed to pass the 50% head of water line were undertaken predominantly in cohesive stratum. These tests have been calculated by Stantec using linear interpolation of the data. Estimated infiltration rates from the incomplete tests were between about 1×10^{-7} and 4×10^{-7} m/s.

4.6 Permeability Testing

4.6.1 Downhole permeability testing was carried out as part of both the 2019 investigation undertaken by Hydrock Limited (now part of Stantec) and the 2025 Investigation undertaken by Stantec UK Ltd. A total of seven tests were conducted across the Parkside Site within the Wittering Formation, two during the 2019 investigation (BH07) and five during the 2025 investigation (BH01 to BH04). A summary of the testing result calculated by the ground investigation contractors is presented in Table XX and Table XX below:

Table 4.3 Summary of Falling Head Testing results

Location	Depth (m bgl)	Tests	Infiltration Rate (l/s)	Comment
Hydrock 2019 Investigation				
BH07	3.0 and 8.0	Falling Head	Not Calculated	Terminated after 1 hour due to negligible drop in water level
Stantec 2025 Investigation				
BH01	1.0 to 5.0	Falling Head(1)	Not Calculated	Terminated after 1 hour due to negligible drop in water level
BH02	1.0 to 5.0	Falling Head(1)	0.0 to 0.02	Terminated after 1 hour due to negligible drop in water level
BH02 – T2	1.0 to 5.0	Falling Head(1)	0.0 to 0.006	Terminated after 1 hour due to negligible drop in water level

1) Testing undertaken using the Kent County Council Soakaway Guidance (2001)

Table 4.4 Summary of Rising Head Testing results

Location	Depth (m bgl)	Tests	Permeability Coefficient (m/s)	Comment
BH03	1.34 to 6.0	Rising Head	Not Calculated	Terminated due to water not returning to stable groundwater level
BH04	1.2 to 5.0	Rising Head	1.19×10^{-6}	-

4.6.2 The tests undertaken in boreholes BH07, BH01 and BH02 were all carried out in the cohesive layers of the Wittering Formation. The testing carried out in BH03 and BH04 were undertaken across both the cohesive and granular layers.

4.7 Groundwater Summary

4.7.1 The groundwater levels at the site were recorded typically between 0.50 and 3.75 m bgl. Groundwater levels were locally recorded as shallow as ground level during the previous ground investigations.

4.7.2 The infiltration coefficient calculated based on the infiltration tests completed was between about 9×10^{-7} and 1×10^{-6} m/s. It is noted that the vast majority of tests were not completed owing to the very low permeability/infiltration coefficient of the near surface soils and time restrictions. Estimate values of infiltration coefficient using extrapolation provided values of

between about 1 x 10^{-7} and 4 x 10^{-7} m/s. The infiltration values fall within the typical range of infiltration coefficients for a 'very poor infiltration media – silt clay loam' (CIRIA, 2015). The engineering descriptions and available Particle Size Distribution test for the tested samples of the Wittering Formation predominately support the CIRIA classification of a 'silt clay cloam' soil type.

4.7.3 Whilst granular layers are present within the Wittering Formation, these are considered to be less prevalent than the cohesive dominated layers. The lateral and vertical distribution of granular layers across the Site is noted to be inconsistent and should not be relied upon for targeted infiltration drainage.

4.7.4 Overall it is considered that based on the presence of groundwater at a shallow depth in combination with the low infiltration coefficient of the near surface the use of shallow infiltration systems for the disposal of surface water is not suitable for the site.

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Drawings

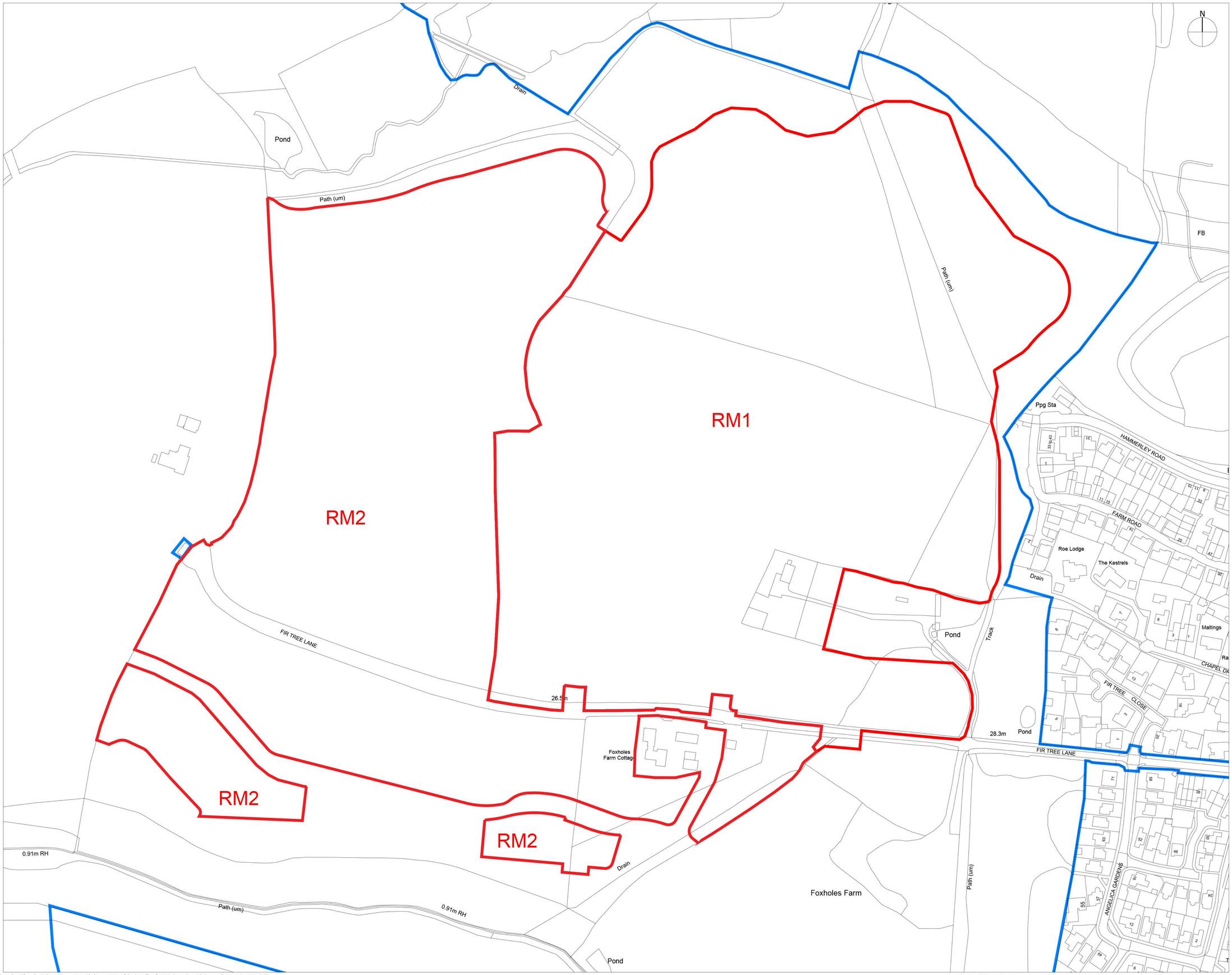
The scaling of this drawing cannot be assured

Revision		Date	Drn	Ckd
A	Red line updated	18.08.25	LA	RMcW
B	Red line updated	01.09.25	LA	RMcW
C	SID & basins removed from red line & Fir Tree Lane updated.	04.09.25	LA	RMcW
D	RM2 Boundary updated to reflect SIDs boundary	05.09.25	LA	RMcW
E	Updated to reflect NW comments	15.09.25	LA	RMcW
F	Redline updated and xrefs unloaded	29.09.25	LA	RMcW
G	Red line adjusted around blue line	29.09.25	LA	RMcW

LEGEND

OWNERSHIP BOUNDARY

RMA BOUNDARY



Project
One Horton Heath

Drawing Title
RMA Boundaries Plan

Date	Scale	Drawn by	Check by
11.08.2025	1:1250 @A1	LA	RMcW
Project No	**Drawing No**		**Revision**
332612639	STA-ZZ-DR-L-003		G

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The scaling of this drawing cannot be assured.

LEGEND

HARD LANDSCAPE - SURFACING

ROADS & FOOTPATHS: TARMAC SURFACE
Tarmac, to Tarmac, to Engineers Design & Specification with countryside kerb.

PARKING: PERMEABLE TARMAC SURFACE
Tarmac, to Engineers Design & Specification.

ROAD FOCAL PAVING: ENHANCED SURFACING
Concrete block paving or similar.
Size: 240 x 160mm to be confirmed by Engineer.
Colour: Harvest
Pattern: Herringbone, with Single Soldier course of Harvest 240 x 160mm block.

ROAD THRESHOLD PAVING: ENHANCED SURFACING
Concrete block paving
Size: 240 x 160mm to be confirmed by Engineer.
Colour: Traditional
Pattern: Herringbone, with Single Soldier course of Harvest 240 x 160mm block.

PRIVATE PATIOS: SLAB PAVING
Colour: Brownridge Finish: Flamed Size: 450 x 450mm Pattern: Staggered bond. Additional: Double Stretcher course of 100 x 300mm sett paving, Brownridge, Blasted.

KEY SPACES: PAVING SLAB AND SETT PAVING
Colour: Brownridge Finish: Flamed Size: 400 x 200mm Pattern: Herringbone. Additional: 200mm Soldier course of 200 x 100mm sett paving, Brownridge, Blasted.

PUBLIC OPEN SPACE FOOTPATHS: COMPACTED GRAVEL
Self-binding gravel.
Size: 6mm to dust aggregate size.
Colour: Golden Colour, or as locally sourced.
Additional: Tegula Cobble concrete block paving or equal and approved, 100 x 100mm Traditional, double staggered solider as edging.

GRAVEL GARDEN:
Site won stone / boulders, with river washed cobbles. Infill with 20mm gravel.

HARD LANDSCAPE - FENCING

ESTATE RAILINGS:
Britannia Metalwork Services Ltd 'Railings'
High: 900mm High
Material: Steel, Powder Coated Black
Additional: Cast Iron Decorative Posts with finials for ends and changes in direction and railings.

HARD LANDSCAPE - FURNITURE

BENCHES
Hardwood timber.

PICNIC SET

SEATS
Stone.

CYCLE STANDS
Galvanised steel stands, powder coated dark grey.

BOLLARDS
Hardwood timber.

PLAY

PROPOSED INDICATIVE PLAY EQUIPMENT
Refer to Play Strategy and Play Manufacturers details for detailed information.

PROPOSED SAFETY SURFACING

PROPOSED PLAY BARK

SOFT LANDSCAPE - STRUCTURAL PLANTING

EXISTING TREES & VEGETATION TO BE RETAINED
As per Arboricultural Information.

PROPOSED FEATURE TREE PLANTING
12 - 14cm girth Rootballed
xx cm high
Refer to Plant Schedule for details.

PROPOSED STRUCTURAL TREE PLANTING
14 - 16cm girth Rootballed
16 - 18cm girth
175 - 200cm high
Refer to Plant Schedule for details.

PROPOSED SPECIMEN TREE PLANTING
xx cm high Rootballed
Refer to Plant Schedule for details.

PROPOSED FEATURE TREE PLANTING
12 - 14cm girth Rootballed
xx cm high
Refer to Plant Schedule for details.

PROPOSED FEATURE TREE PLANTING
12 - 14cm girth Rootballed
xx cm high
Refer to Plant Schedule for details.

PROPOSED PARKLAND TREE PLANTING
12 - 14cm girth Rootballed
xx cm high
Refer to Plant Schedule for details.

PROPOSED PARKLAND TREE PLANTING
12 - 14cm girth Rootballed
xx cm high
Refer to Plant Schedule for details.

PROPOSED PINE TREE PLANTING
xx cm high Rootballed
Refer to Plant Schedule for details.

PROPOSED HEDGE PLANTING
Formal hedge plants, Pre-grown 1 metre troughs hedges, & 2 Litre pots. See Plant Schedule for details.
Hedging to be planted at 4 plants per linear metre with 450mm topsoil min, and 550mm subsoil with 50mm bark mulch to surface dressing.

SOFT LANDSCAPE - NATIVE PLANTING

PROPOSED AMENITY GRASS
Bourne Amenity, 'Rhizomatous Tall Fescue (RTF) Turf' 1m² rolls. Turf including species: 45% Labyrinth, 40% Barlexus, 15% Bartender. Turf laid over 150mm min. topsoil and 550mm subsoil.

PROPOSED READ GARDENS

PROPOSED PLANTING
Refer to Plant Schedule for details.

PROPOSED POS PLANTING
Refer to Plant Schedule for details.

PROPOSED SUDS PLANTING
Refer to Plant Schedule for details.

PROPOSED MEADOW GRASS FOR WET SOIL
Refer to Plant Schedule for details.

PROPOSED MEADOW GRASS FOR WET SOIL 2
Refer to Plant Schedule for details.

PROPOSED MEADOW GRASS FOR WET SOIL 3
Refer to Plant Schedule for details.

PROPOSED WILDFLOWER GRASS
Refer to Plant Schedule for details.

N

PLANNING ISSUE

Project
One Horton Heath
The Folds, Holme & Homestal

Drawing Title
Landscape Masterplan
Site Wide

Date	Scale	Drawn by	Check by
09.12.25	1:1000 @A0	LA/EC	RMcW

Project No	Drawing No	Revision
332612639	STA-ZZ-ZZ-DR-L-2000	B

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Figures

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Site Grid Ref: 448780E 117001N

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Client/Project:
Eastleigh Borough Council

One Horton Heath

Title
Site Location Plan

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davco	RPa	2025.05.16	01	1

Plotted: 20.05.2025 2025.05.20 10:07:23 AM By: Cotton, David
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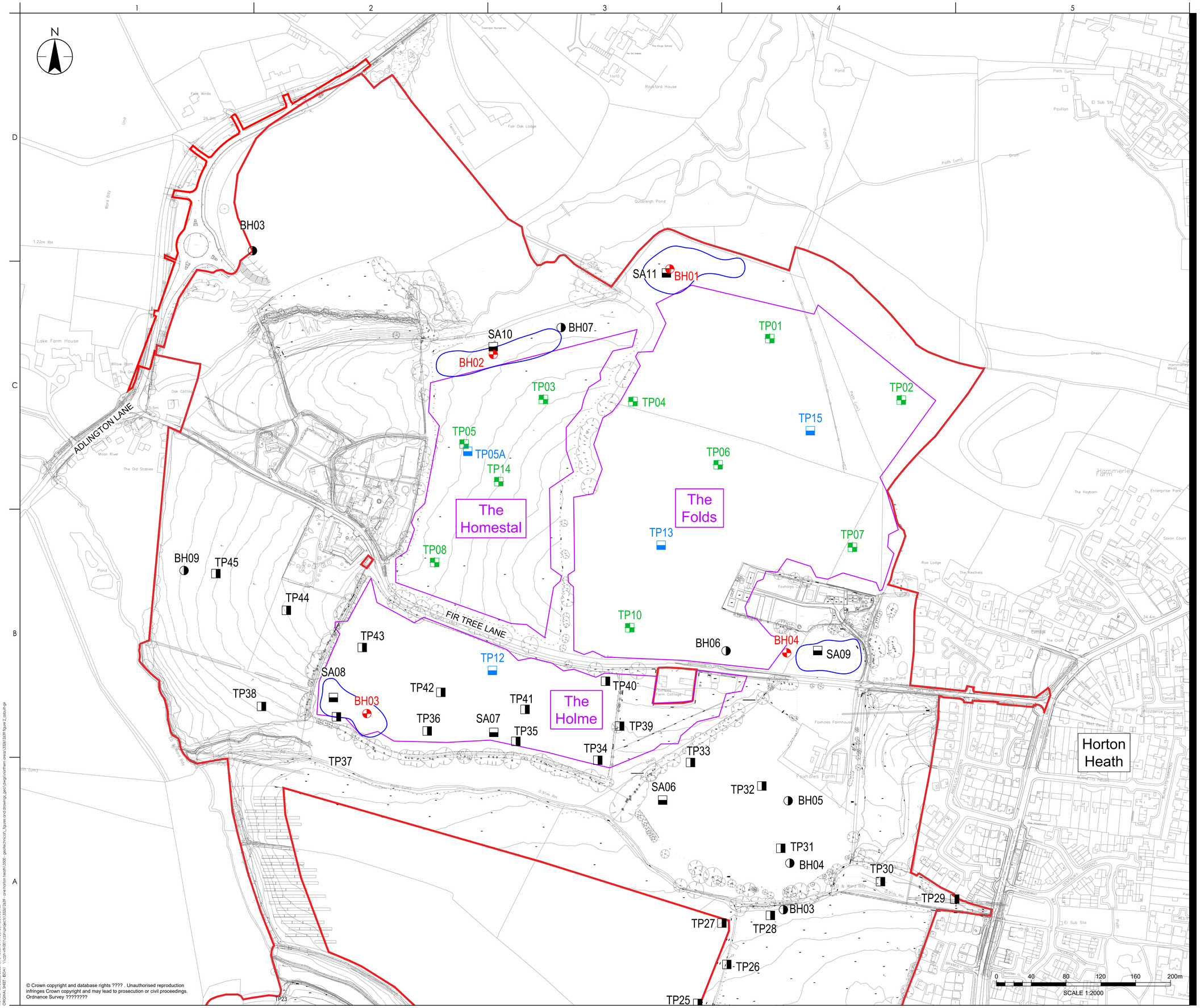

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Notes

Key

- Site Boundary
- Parcel Development Platform
- Proposed Basins
- Borehole Location
- Trial Pit Location
- Trial Pit with Infiltration Test
- Historical Borehole
- Historical Trial Pit
- Historical Trial Pit with Infiltration Test

P01 FIRST ISSUE	davco	LC	LC	2025.10.16
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Issue Status

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Client/Project

Eastleigh Borough Council

Parkside,
One Horton Heath,
Hampshire

Title

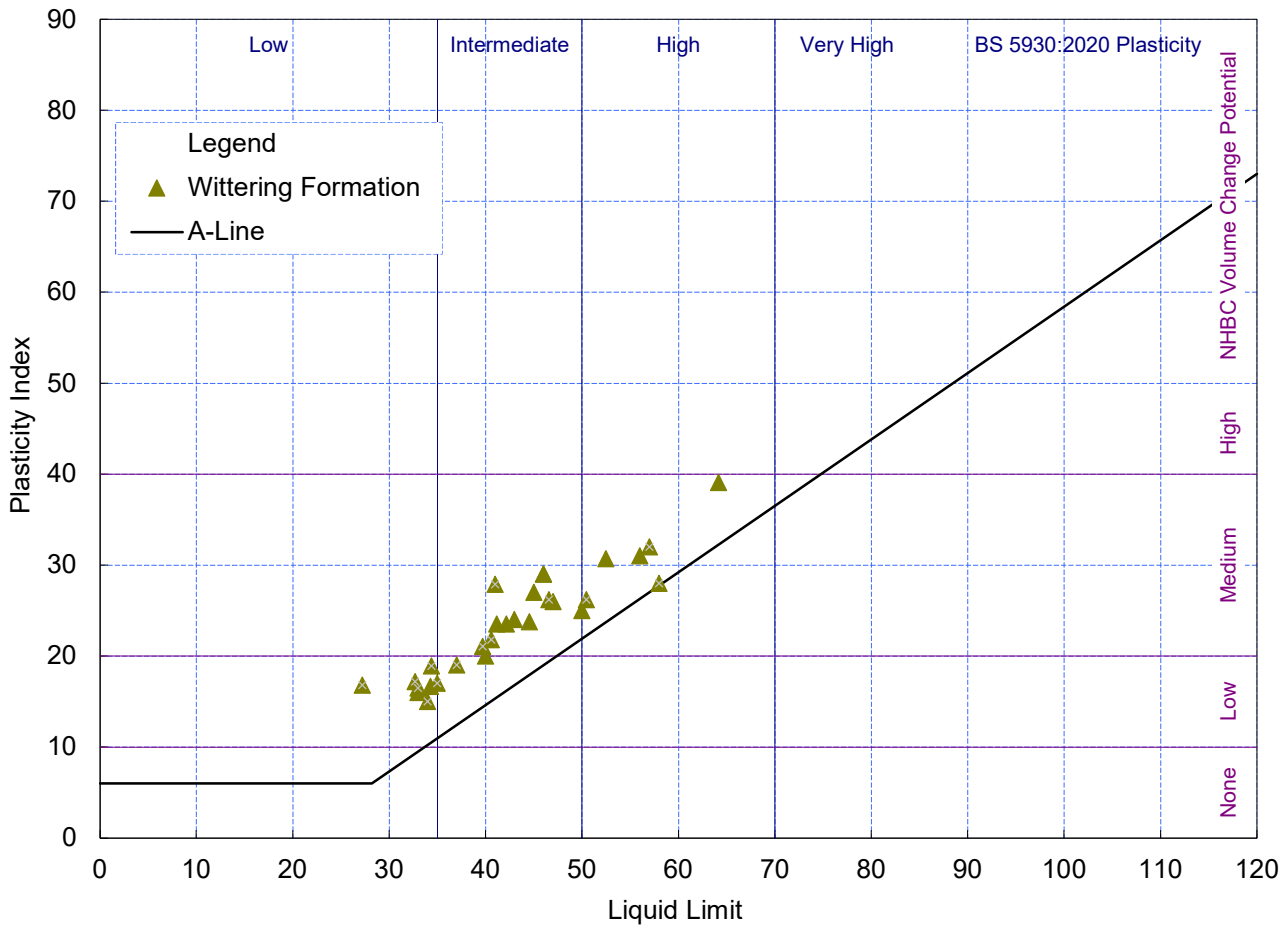
Exploratory Hole Location Plan

Project No. 332612639

A1 Scale 1:2000

Revision P01

Figure No. Figure 2



Notes

1 Values of liquid limit and plasticity index have been modified by the percentage of particles less than 425µm.

2 Symbols marked x denote data from historical ground investigations

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ONE HORTON HEATH, HAMPSHIRE: PARKSIDE

Title

ATTERBERG LIMITS

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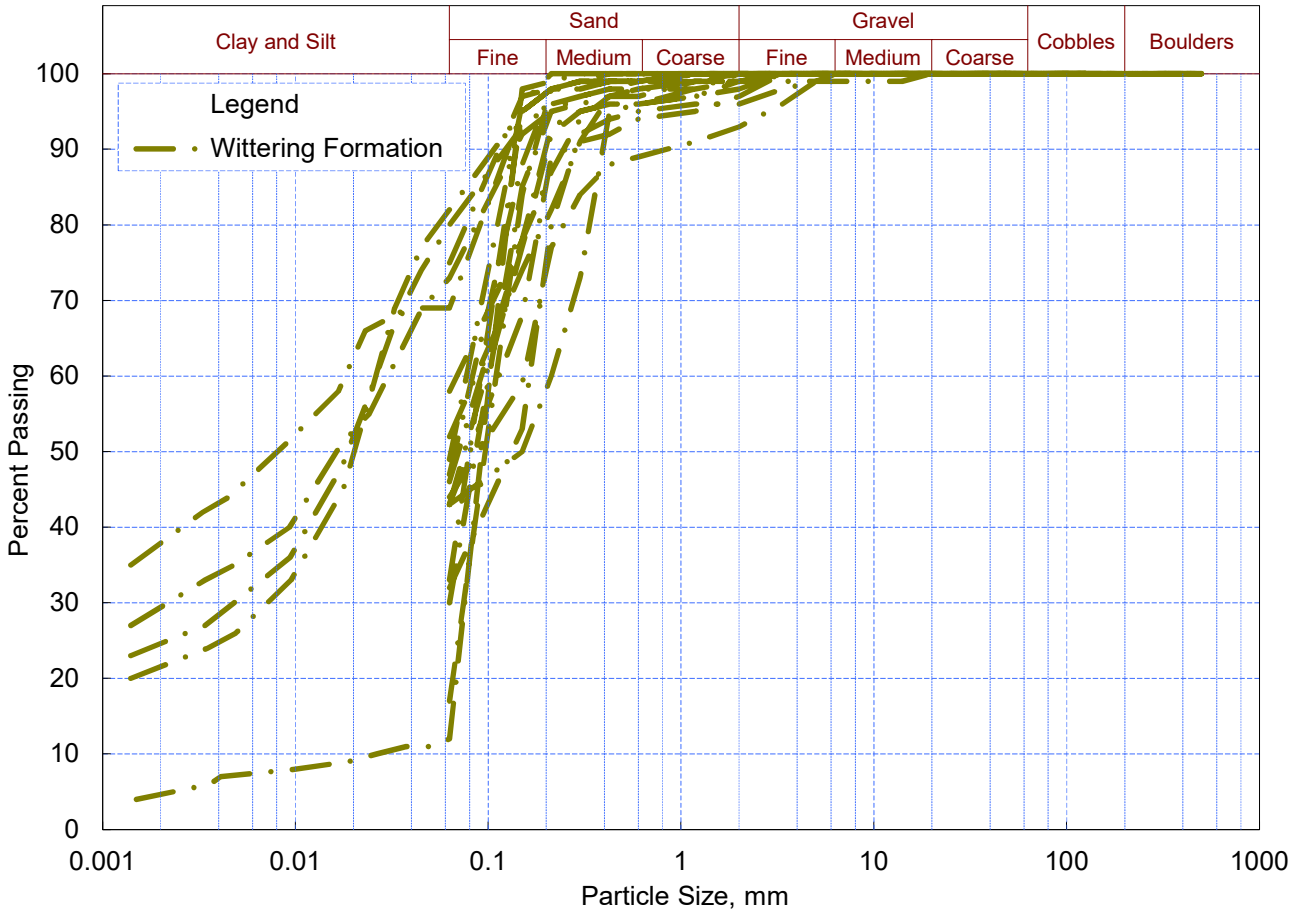

Notes

1 Selected Data: Stantec 2025, Ridge 2023

Strata	Number of Tests	Gravel Content, %	Sand Content, %	Fines Content, %
Wittering Formation	19	0 to 7	18 to 88	12 to 82

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ONE HORTON HEATH, HAMPSHIRE: PARKSIDE

Title

PARTICLE SIZE DISTRIBUTION

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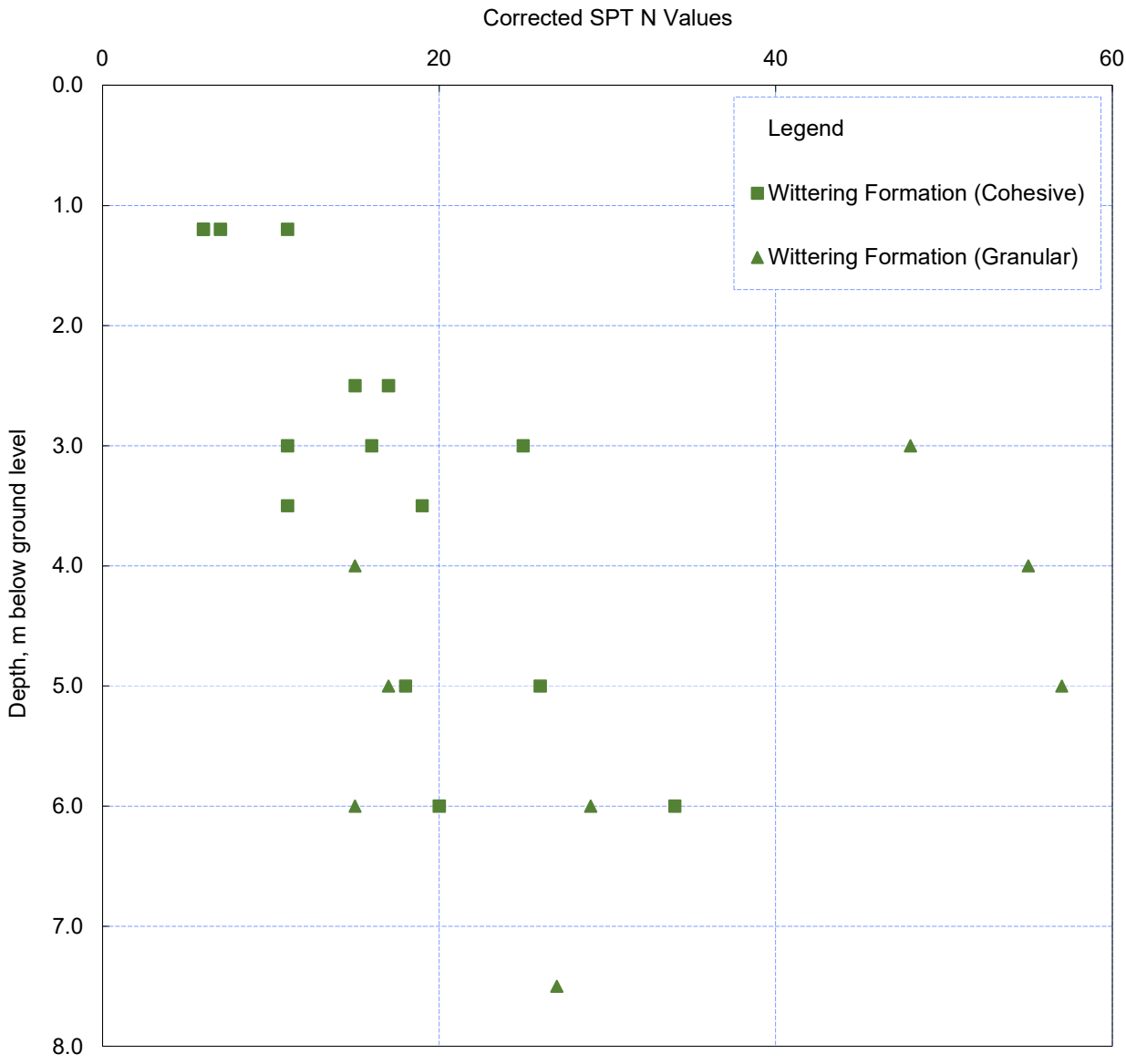

Notes

1 SPT N values have been normalised for hammer efficiency and corrected for overburden pressure in accordance with BS EN 22476-3 (2005)

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ONE HORTON HEATH, HAMPSHIRE: PARKSIDE

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SPT N VALUES

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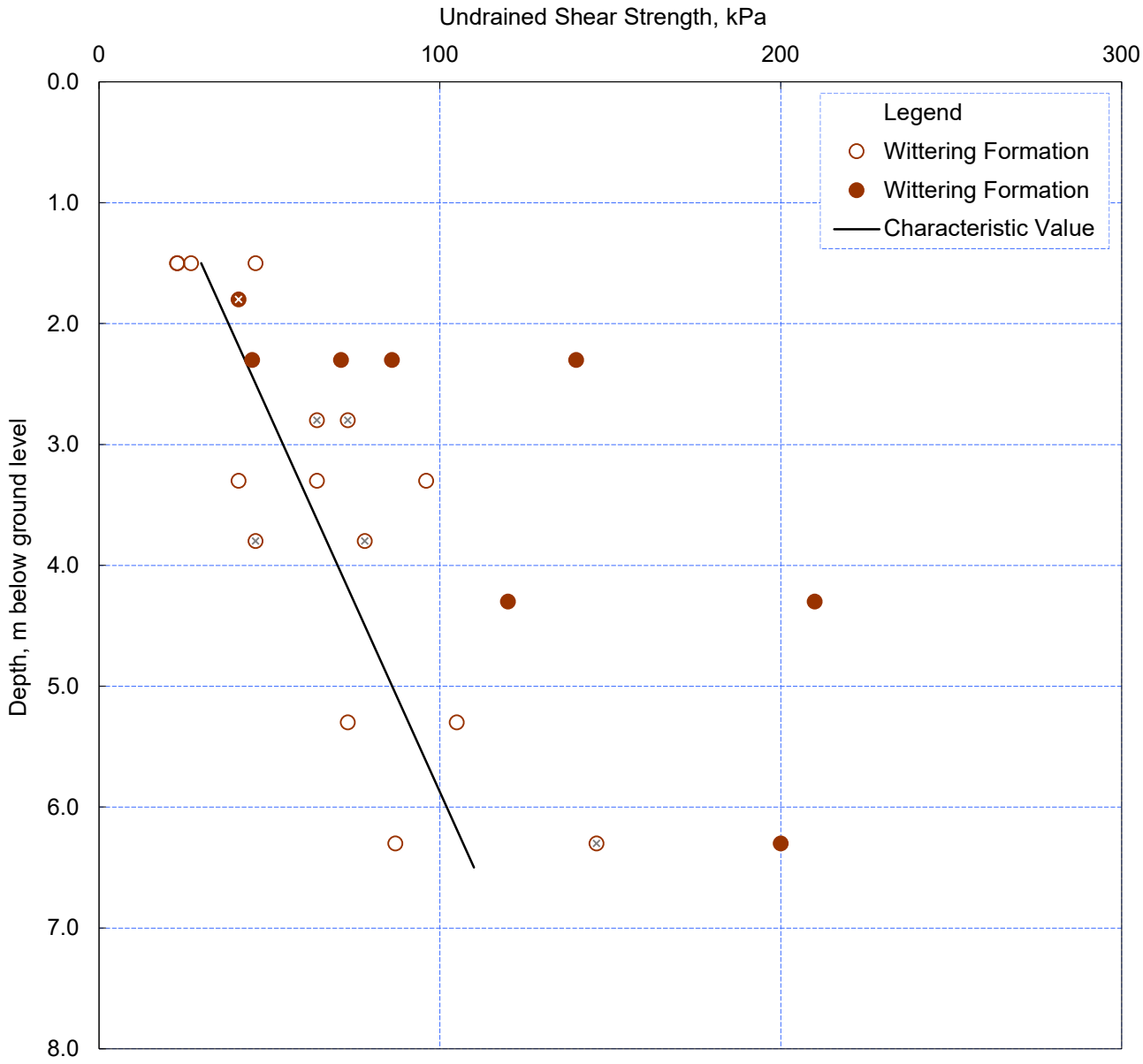

Notes

1 Open symbols denote values of undrained shear strength determined using the empirical correlation with SPT N values (Stroud, 1989) with a factor Nc of 4.5 and SPT N values normalised for hammer efficiency.

2 Closed symbols denote values of undrained shear strength determined by laboratory triaxial testing of 100 mm diameter specimens

3 Symbols marked x denote data from historical ground investigations

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ONE HORTON HEATH, HAMPSHIRE: PARKSIDE

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UNDRAINED SHEAR STRENGTH

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[Printed: 03/10/2025 08:48 By: Fairweather, Tom]

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2) The opinions and recommendations expressed in this report are based on statute, guidance, and best practice current at the time of its publication. Stantec UK Ltd (Stantec) does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and the report should be returned to us and reassessed if required for re-use after one year from date of publication. Following delivery of the report, Stantec has no obligation to advise the Client or any other party of such changes or their repercussions.

3) Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third-party data used.

4) Historical maps and aerial photographs provide a “snapshot” in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times. It is possible for developments to have occurred between surveys that are not shown or for the map record to have been censored for military security.

5) The absence of cavity records in the Stantec natural and mining cavities (non-coal) databases is not considered as conclusive as to the absence of these features and we do not warranty that the data is complete or error free.

6) The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be considered in any analysis and reporting.

7) It should be noted that this report is a land condition assessment and does not purport to be an ecological, flood risk or archaeological survey and additional specific surveys may be required.

8) The identification of invasive and/or noxious plants such as Japanese Knotweed is outside the remit of our appointment.

9) This report has been written for the sole use of the Client stated at the front of the report in relation to a specific development or scheme. The conclusions and recommendations presented herein are only relevant to the scheme or the phase of project under consideration. This report shall not be relied upon or transferred to any other party without the expressed written authorisation of Stantec. Any such party relies upon the report at its own risk.

10) The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not considered the perceptions of, for example, banks, insurers, other funders, lay people, etc., unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

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