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HORTON HEATH

**FLOOD RISK ASSESSMENT AND WATER
MANAGEMENT STRATEGY**



HORTON HEATH, EASTLEIGH

**FLOOD RISK ASSESSMENT AND WATER MANAGEMENT STRATEGY
ON BEHALF OF EASTLEIGH BOROUGH COUNCIL**

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-	Draft issue for Team comment	NA	NA	GG	GG	July 2020
A	Updated to suit latest site boundary and layout	NA/JW	JH	JW	JH	November 2020
B	Updated to suit comments	JW	JH	NA	JH	December 2020



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1.0 INTRODUCTION

1.1.1 Odyssey has been commissioned by Eastleigh Borough Council (EBC) to undertake a Flood Risk Assessment (FRA), incorporating a surface water and foul water management strategy, to be submitted in association with a planning application for proposed residential development at Horton Heath in Eastleigh.

1.1.2 The wider One Horton Heath development has obtained planning permission via two separate applications. EBC is planning to submit a new composite outline planning permission for the wider site, increasing the number of proposed dwellings from circa 1,500 to 2,500.

1.1.3 This FRA and Water Management Strategy relates to the first residential parcel of the development, shown as OPA1 in the Phasing Plan in **Appendix A**.

1.1.4 The First Residential Parcel application (hereafter referred to as FRP) forms Phase 1 of the wider Outline Planning Application, providing 393 of the 2,500 dwellings for which outline consent is sought. The FRP has been submitted as a standalone planning application to enable the early deliver of homes within the One Horton Heath development. However the FRP proposal is entirely consistent with the outline parameter plans, with detailed assessment of the OPA and FRP having been considered in tandem to ensure consistency throughout the design process. In part, the FRP is reliant on the mitigation and enhancements of the OPA.

1.1.5 This report sets out the main flood risks to the site and those that may arise as a result of the development. It also demonstrates the principles of surface water management at the site.



2.0 EXISTING SITE CONDITIONS

2.1 *Site Location*

2.1.1 The site is located approximately three miles to the southeast of Eastleigh town centre. The site is bounded by trees and Chalcroft Business Park to the southwest, Chalcroft Farm to the northwest, land allocated for future residential development to the north, and Burnetts Lane to the southeast.

2.1.2 The site comprises undeveloped agricultural fields. The Ordnance Survey (OS) grid reference for the approximate centre of the site is 448918 East, 116267 North and the nearest postcode is SO30 2HH. The site location plan and proposed site layout are presented in **Appendix B**.

2.2 *Topography*

2.2.1 A topographical survey of the site was undertaken by Reuby and Stagg in May 2019. Levels generally fall from the southeast towards north and west of the site, and range from approximately 29.66m Above Ordnance Datum (AOD) in the southeast to approximately 19.8m AOD in the north. The topographical survey is presented in **Appendix C**.

2.3 *Geology and Hydrogeology*

2.3.1 British Geological Survey (BGS) online maps (accessed July 2020) indicate that the bedrock geology of the majority of the site comprises Wittering Formation (sand, silt and clay). There is a smaller area to the east of the site which comprises Earnley Sand Formation (sand, silt and clay). The maps show the presence of superficial deposits comprising Alluvium (clay, silt, sand and gravel) associated with the watercourse to the north of the site. BGS mapping is shown in **Appendix D**.

2.3.2 A ground investigation of the wider site was undertaken by Hydrock in October 2018. The geology encountered largely corresponds with the BGS maps; topsoil, Head Deposits and Wittering Formation were encountered within the area to be developed as the first residential parcel. Extracts from the ground investigation are presented in **Appendix E**.

2.3.3 Environment Agency (EA) online maps indicate that the nearest Main River is located approximately 4700m to the northwest of the site. There is a ditch network located along the western site boundary, and to the east of Chalcroft Farm.



2.3.4 BGS hydrogeology mapping shows that the site is located within the Bracklesham Group and Barton Group, described as a moderately productive aquifer.

2.3.5 Groundwater mapping published by the EA indicates that the site is not located within a groundwater Source Protection Zone. Groundwater levels were recorded across the wider site as part of the ground investigation. The groundwater level recorded within the first residential parcel area was 2.70m bgl. The groundwater level data summary is included in **Appendix E**.

2.3.6 The results of permeability testing at the site were not suitable to allow conventional calculation of infiltration rates due to slow or no ingress of water within the test locations. The ground investigation report states that this is likely to be due to the cohesive ground conditions.

2.4 Existing Drainage

2.4.1 Services information for the wider site was provided by Hilson Moran in October 2019. The Existing Services drawing shows that there are no existing surface water or foul sewers located within the immediate vicinity of the site. The Existing Services drawing is shown in **Appendix F**.



3.0 PLANNING POLICY

3.1 *Flood and Water Management Act (2010)*

3.1.1 The Flood and Water Management Act (FWMA) received royal assent on 8th April 2010. It was intended to implement Sir Michael Pitt's recommendations following the widespread summer 2007 floods. The FWMA encourages the use of sustainable drainage systems (SuDS) on development sites by removing the automatic right to connect to sewers.

3.2 *National Planning Policy Framework (2019)*

3.2.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies, and how these policies should be applied. Planning Practice Guidance (PPG) is available online and provides additional guidance to the NPPF.

3.2.2 Paragraph 155 of the NPPF states that *"inappropriate development in areas at risk of flooding should be avoided by directing development away from areas of highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere"*.

3.2.3 Paragraph 163 states *"when determining planning applications, Local Planning Authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

- *Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- *The development is appropriately flood resistant and resilient;*
- *It incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- *Any residual risk can be safely managed; and*
- *Safe access and escape routes are included where appropriate, as part of an agreed emergency plan."*



3.3 *Planning Practice Guidance (2019)*

3.3.1 The PPG provides additional direction to the NPPF, and includes the following drainage hierarchy whereby the aim should be to discharge surface water runoff as high up the hierarchy of drainage options as reasonably practicable:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain, or another drainage system;
- To a combined sewer.

3.4 *Adopted Eastleigh Borough Local Plan (2001 – 2011)*

3.4.1 Policy 43.ES addresses flooding and erosion. The policy states that development would only be permitted within areas at risk of flooding where the following criteria are met:

- It is demonstrated that the site is adequately defended from flooding; or
- An FRA satisfactorily demonstrates that measures incorporated into the scheme would prevent either life being endangered or an unacceptable likelihood of damage to the property; and
- It does not harm the integrity or maintenance of a flood defence structure, or inhibit the maintenance of a watercourse for the purpose of minimising flood risk, or increase flood risks elsewhere.

3.4.2 Policy 45.ES states that development proposals must incorporate adequate measures for the disposal of surface water from the development including, where practicable, source control techniques and SuDS, incorporating defined arrangements for the future maintenance of the system.



4.0 SOURCES OF FLOOD RISK

4.1 *Fluvial Flooding*

4.1.1 Fluvial flooding is caused by high flows in rivers or streams exceeding the capacity of the river channel and spilling into the floodplain, or in some cases on a designated floodplain which can occur after a period of heavy rainfall.

4.1.2 The site is located within fluvial Flood Zone 1, defined as land having a less than 1 in 1,000 annual probability of river or sea flooding.

4.2 *Surface Water Flooding*

4.2.1 Surface water (pluvial) flooding is caused by rainfall levels exceeding the natural infiltration properties of the surrounding soils. It occurs where there is a lack of a formalised drainage system, as a result of poorly designed or maintained sewer systems or due to no natural method of drainage such as watercourses or ditches, or where soil infiltration rates are low. It often results in ponding of water at low points or backing up behind obstructions.

4.2.2 EA mapping shows that the vast majority of the site is located in an area at 'very low' risk of surface water flooding. Very low risk means that each year this area has a less than 1 in 1,000 probability of flooding.

4.2.3 There are a small number of narrow areas at 'low', 'medium' and 'high' risk of flooding. These are located to the south and the north of the site, and largely along the field boundaries and associated with the ditches.

4.3 *Groundwater Flooding*

4.3.1 Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A groundwater flood event results from a rise in groundwater level sufficient for the water table to intersect the ground surface and inundate low lying land. Periods of prolonged rainfall may also be a cause of groundwater flooding with aquifers and soils becoming saturated.

4.3.2 The Partnership for South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA) mapping shows that there have been no recorded groundwater flood incidents at the site.



4.4 *Sewer Flooding*

4.4.1 Flooding can occur due to the failure of existing foul or surface water drainage infrastructure. If flows within the drainage system exceed the designed capacity or foreign matter causes blockages, overflow to the surface can occur, leading to flooding.

4.4.2 There are no surface water or foul sewers located at the site, and as such the risk of sewer flooding is deemed to be low.

4.5 *Flooding from Artificial Sources*

4.5.1 Failure and overtopping of reservoirs and navigable water bodies, and failure of water mains constitute the primary means of flooding from artificial sources.

4.5.2 The EA's Flood Risk from Reservoirs mapping shows that the site is not located within an area at risk of reservoir flooding.



5.0 THE SEQUENTIAL TEST AND THE EXCEPTION TEST

5.1 *The Sequential Test*

5.1.1 The EA Flood Zones are the starting point for the sequential approach promoted by the NPPF, and are shown on the EA flood maps. The PPG identifies that the overall aim of the Sequential Test is to steer new development to Flood Zone 1.

5.1.2 As stated by the NPPF, development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The SFRA would provide the basis for applying this test.

5.1.3 Following application of the Sequential Test, if it is not possible for the development to be located in zones with a lower probability of flooding (Flood Zone 1), proposed sites should take into account the flood risk vulnerability of land uses and consider reasonable sites in Flood Zone 2, and apply the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 and 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

5.1.4 The development footprints are entirely situated within Flood Zone 1 and the site is therefore suitable for the proposed development in accordance with the NPPF and PPG. The Sequential Test is therefore not required.

5.2 *The Exception Test*

5.2.1 For the Exception Test to be passed, a development proposal:

- Must demonstrate that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA;
- The development should be on developable brownfield land, or, if not, it must be demonstrated that there is no such alternative land available; and
- An FRA must demonstrate that the development would be safe for its lifetime, taking into account the vulnerability of its users, without increasing flood risk elsewhere, and where possible, reducing flood risk overall.

5.2.2 The development footprints are entirely situated within Flood Zone 1, and as such the Exception Test is not required.



6.0 PROPOSED WATER MANAGEMENT STRATEGY

6.1 *Proposed Surface Water Management Strategy*

6.1.1 The indicative surface water management strategy for the FRP, drawing reference **19-367/001** described below is presented in **Appendix G**.

6.1.2 A SuDS Management Train drawing, reference **G277/24** was prepared by PFA Consulting in November 2020 and included as part of the PFA Flood Risk Assessment for the overall site. The drawing is also presented in **Appendix H** of this report for information.

6.1.3 The drainage hierarchy set out in **Section 3.3** states that infiltration should be the first option for surface water discharge. However, infiltration rates could not be calculated during the ground investigation due to the cohesive properties of the underlying geology. As such, infiltration is deemed to be unsuitable for the proposed development.

6.1.4 The next option in the drainage hierarchy is to discharge flows to a surface water body.

6.1.5 It is proposed that surface water runoff generated by the development would drain to permeable paving, swales and attenuation basins across the development parcel. Flows would then be discharged at restricted rates to the adjacent ditches to the west and northwest of the site. The location of the basins is set out in the site-wide Indicative Location of Strategic SuDS Features drawing, drawing number **G277/22 Sheet 2 of 2 Rev A**, prepared by PFA Consulting in November 2020. This plan is presented in **Appendix H**. Surface water generated by the main trunk road in the development parcel would drain to 'Basin South'.

6.1.6 The plan prepared by PFA Consulting also sets out the discharge rates for the site, based on the approved mean annual maximum flow rate (QMED) greenfield runoff rate of 8.1 litres per second per hectare (l/s/ha). The attenuation basins have been designed to meet these discharge rates. **Table 6.1** sets out the allowable discharge rate for each basin, as set out in the PFA Consulting plan.

Table 6-1: Allowable Discharge Rates

SuDs Feature	Allowable Discharge Rate (l/s)
Basin I and J	29.6
Basin K	13.6
Basin L	39.6

6.1.7 The SuDS attenuation features would be designed to accommodate the 1 in 100 year storm plus 40% to account for climate change. The basins would also be designed in line with the Typical



Layout of Strategic SuDS Features to Inform Detailed Design drawing, reference G277/23, prepared by PFA consulting in November 2020 as part of the Flood Risk Assessment for the overall site. The drawing is presented in **Appendix H**. A 10% increase in impermeable roof area would be incorporated within the calculations to account for urban creep.

6.2 Water Quality

6.2.1 The 'pollution hazard indices for different land use classifications' table has been extracted from CIRIA C 753 The SuDS Manual and applied to the development proposals, as shown in Table 6.2.

Table 6-2: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements per day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads or motorways	Medium	0.7	0.6	0.7

6.2.2 The proposed permeable paving, swales and attenuation basins would provide treatment for the surface water runoff from the site. The SuDS mitigation indices have been extracted from The SuDS Manual and are set out in **Table 6.3**.

Table 6-3: Pollution Mitigation Indices

Land Use	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Swale	0.5	0.6	0.6
Detention Basin	0.5	0.5	0.6



6.2.3 Additional proprietary treatment devices could be used where necessary to ensure that all surface water runoff receives the appropriate level of treatment prior to discharging offsite.

6.2.4 The onsite water management system maintenance would be carried out by a private recognised management company through the implementation of an approved maintenance management plan to minimise the residual risk of water management system blockage. However, for clarity in this FRA, minimum maintenance schedules for permeable paving, swales, detention basins and proprietary treatment systems have been presented in **Appendix I**. These schedules have been extracted from The SuDS Manual.

6.3 *Proposed Foul Water Management Strategy*

6.3.1 It is proposed that foul flows from the site would drain by gravity to a foul pumping station located north of Phase 6A, refer to the site-wide Preliminary Water Management Strategy Plan (Sheet 2 of 2) drawing in **Appendix G**. Flows would then be pumped to the nearest public foul network, subject to approval by Southern Water.



7.0 SUMMARY AND CONCLUSIONS

7.1.1 Odyssey has been commissioned by EBC to undertake an FRA and water management strategy for the proposed residential led development at Horton Heath. The update is due to a change to the boundary of the proposed development.

7.1.2 Based on the EA flood maps, the site is shown to be located within Flood Zone 1. Most of the site lies in an area at 'very low' risk of surface water flooding.

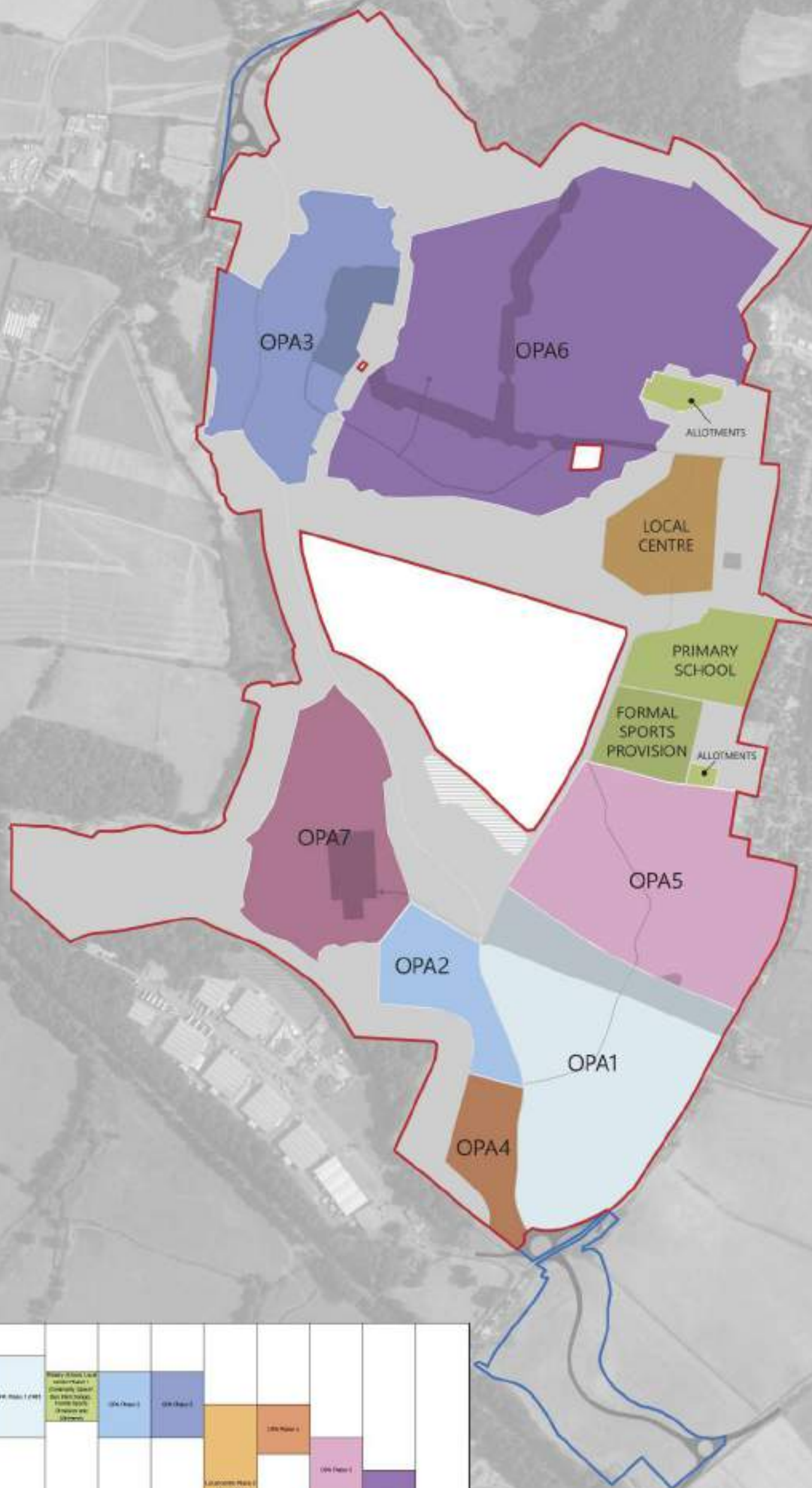
7.1.3 The underlying geological conditions indicate that infiltrating SuDS features are deemed to be unsuitable at the site. As such, surface water runoff would be attenuated using permeable paving, swales and basins, prior to restricted discharge to the local ditch network. The SuDS features would be designed to accommodate flows from the 1 in 100 year storm event plus 40% to account for climate change.

7.1.4 Foul flows would drain to a strategic pumping station and then discharge to the nearest public foul sewer.

7.1.5 This report demonstrates that the proposed development can be drained in a sustainable manner, commensurate with national and local policy.

APPENDIX A

Phasing Drawing



Rev	Description	Date	By	Ch
P1	Preliminary Issue	2010.20	GR/SWD GR	GR
P2	Updated further to client feedback	21.10.20	GR/SWD GR	GR

Romsey Portishead Camberley
 T: 01794 367709 T: 01275 407000 T: 01276 749050
 F: 01794 367276 F: 01794 367276 F: 01794 367276

www.thrivearchitects.co.uk

This drawing is the copyright of Thrive Architects Ltd © All rights reserved. Ordnance Survey Data © Crown Copyright. All rights reserved. Licence No. 100007356. DO NOT scale from this drawing. Contractors, Sub-contractors and suppliers are to check all relevant dimensions and levels of the site and building before commencing any site drawings or building work. Any discrepancies should be referred to the Architect. Where applicable this drawing is to be read in conjunction with the Consultants' drawings.

Rev Description
 P1 Preliminary Issue
 P2 Updated further to client feedback

Date By Ch
 2010.20 GR/SWD GR
 21.10.20 GR/SWD GR

Project **ONE HORTON HEATH**
 Drawing Phasing Plan-01

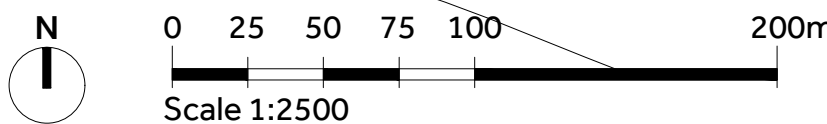
Client	Eastleigh Borough Council	Date	20.10.20
Job no.	EA5T200403	Rev.	P2
Dwg no.	PHP-01	Scale	NT5@A3
Author	GR/SWD	Checked	GR
Status	PRELIMINARY	Office	Romsey
Client ref.	-		



APPENDIX B

Site Location Plan and Proposed Site Layout

Eastleigh Borough Council, Proposed Residential Development



29607A / 01



APPENDIX C

Topographical Survey



APPENDIX D

British Geological Survey Mapping

Bedrock Geology



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Geotitles Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

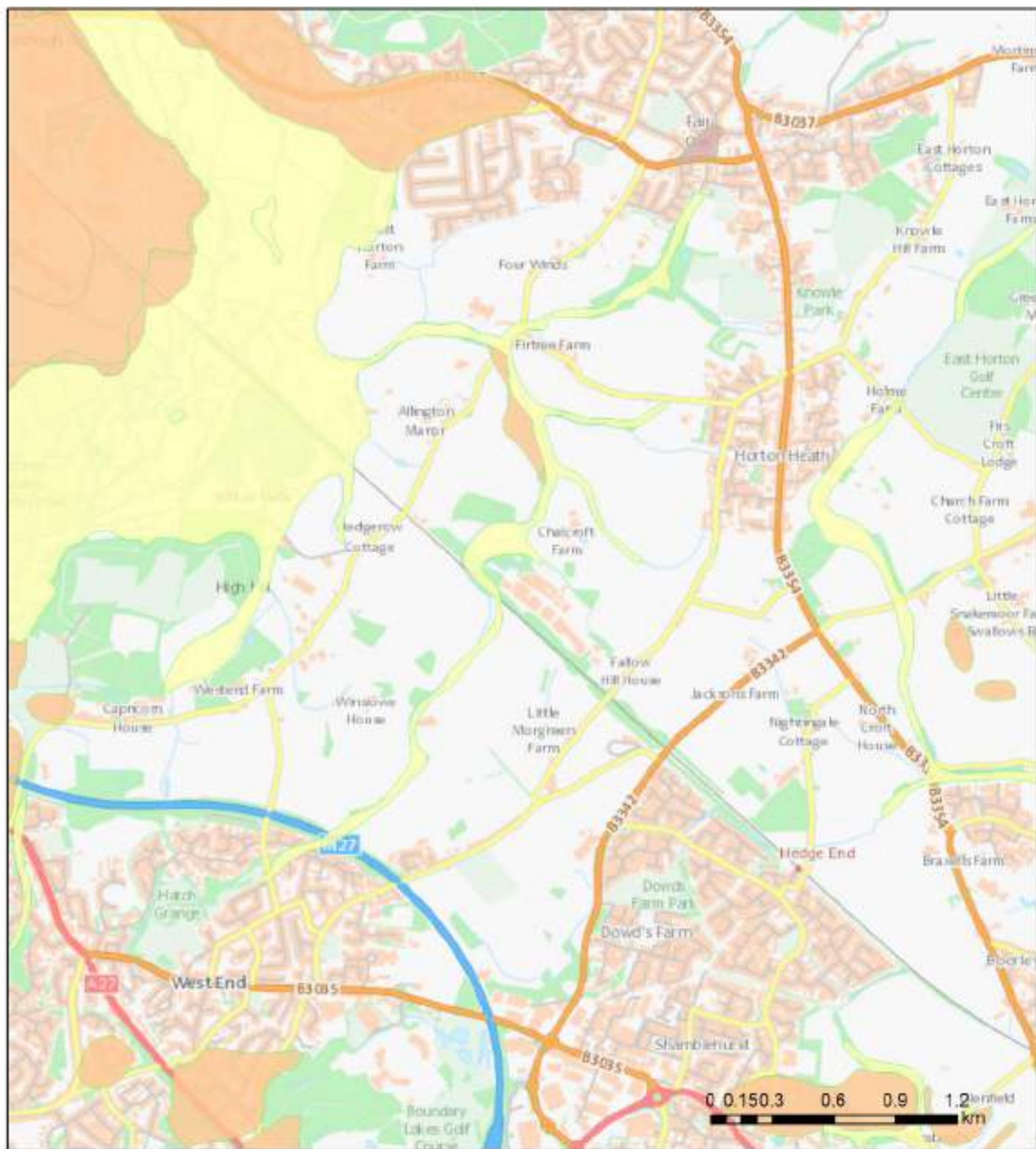
Map Key

Bedrock geology 1:50,000 scale

-  [DURLEY SAND MEMBER - SAND](#)
-  [LONDON CLAY FORMATION - CLAY, SILT AND SAND](#)
-  [PORTSMOUTH SAND MEMBER - SAND](#)
-  [EARNLEY SAND FORMATION - SAND, SILT AND CLAY](#)
-  [LONDON CLAY FORMATION - SAND](#)
-  [MARSH FARM FORMATION - CLAY, SILT AND SAND](#)

Selection Results

Superficial Deposits



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Geotitles Onshore Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Superficial deposits 1:50,000 scale

-  [ALLUVIUM - CLAY, SILT, SAND AND GRAVEL](#)
-  [HEAD - CLAY, SILT, SAND AND GRAVEL](#)
-  [RIVER TERRACE DEPOSITS, 11 - SAND AND GRAVEL](#)
-  [TIDAL FLAT DEPOSITS - CLAY AND SILT](#)

Selection Results

Hydrogeology



British
Geological
Survey



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Geological Data Sources: NERC, Natural England, English Heritage and Ordnance Survey

Map Key

Hydrogeology 1:625,000 scale

Aquifers with significant intergranular flow

-  Highly productive aquifer
-  Moderately productive aquifer
-  Low productivity aquifer

Aquifers in which flow is virtually all through fractures and other discontinuities

-  Highly productive aquifer
-  Moderately productive aquifer
-  Low productivity aquifer
-  Rocks with essentially no groundwater

Selection Results

APPENDIX E

Ground Investigation Extracts

5. GROUND INVESTIGATION RECORDS AND DATA

5.1 Physical ground conditions

5.1.1 Summary of strata encountered

The following presents a summary of the properties of the ground and groundwater conditions encountered, based on field observations, interpretation of the field data and laboratory test results, taking into account drilling, excavation and sampling methods, transport, handling and specimen preparation.

All relevant data from the Hydrock investigation detailed in Section 4.

Details of the Hydrock ground investigation works are provided in the logs in Appendix E, historical data is provided in Appendix D, a summary of the ground model is presented in Table 5.1 and the individual strata are described in the sections below.

Table 5.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
Topsoil	GL	0.40 - 0.50	0.40 - 0.50	0.40
Head Deposits	0.40 – 0.50	1.35 – 2.00	0.95 – 1.60	1.00
River Terrace Deposits	0.40	2.00	1.60	1.60
Earnley Sand Formation	0.40	2.30	1.90	1.90
Wittering Formation	0.40 – 2.00	>8.00	>6.00 - >7.60	Not proven

5.1.2 Topsoil

Topsoil was generally found to be 0.40m and 0.50m thick, with an average thickness of 0.40m. The topsoil comprised a soft light brown to brown sandy gravelly silt with rootlets.

For the purposes of this report, topsoil is defined as the upper layer of an *in situ* soil profile, usually darker in colour and more fertile than the layer below (subsoil), which is a product of natural chemical, physical, biological and environmental processes, but does not imply compliance with BS 3882:2015. Reuse of topsoil as a growing medium at the site should be determined by the landscape architect or the landscape Contractors.

5.1.3 Head Deposits

Head Deposits were encountered underlying the Topsoil in BH01, BH03, BH04, BH06, BH07 and BH10 in general between 0.95m and 1.60m thick, with an average thickness of 1.00m.

Head Deposits generally comprised light brown to orange brown sandy gravelly silt.

5.1.4 River Terrace Deposits

River Terrace Deposits were encountered underlying the Topsoil in BH09 in the north west of the site and were found to be 1.60m thick.

River Terrace Deposits comprised an orange brown sandy, gravelly and cobbly CLAY/SILT.

5.1.5 Wittering Formation

The Wittering Formation was encountered in all locations. The thickness of the formation was not proven by any of the investigative locations.

The Wittering Formation comprised soft to firm orange and orange brown mottled grey, often lenticular or laminated silt, sand and clay where weathered and soft to stiff, grey, often laminated silt, sand and clay at depth.

5.1.6 Earnley Sand Formation

The Earnley Sand Formation was encountered in BH02 only between 0.40m and 2.30m depth comprised light brownish grey slightly silty and slightly gravelly sand.

5.2 Groundwater

5.2.1 Groundwater strikes and levels

Groundwater strikes were not encountered during the investigation; however, it is considered that water strikes are likely to have been discreet considering the nature of the strata encountered and that such strikes may have been missed due to the addition of water to the borehole to facilitate drilling.

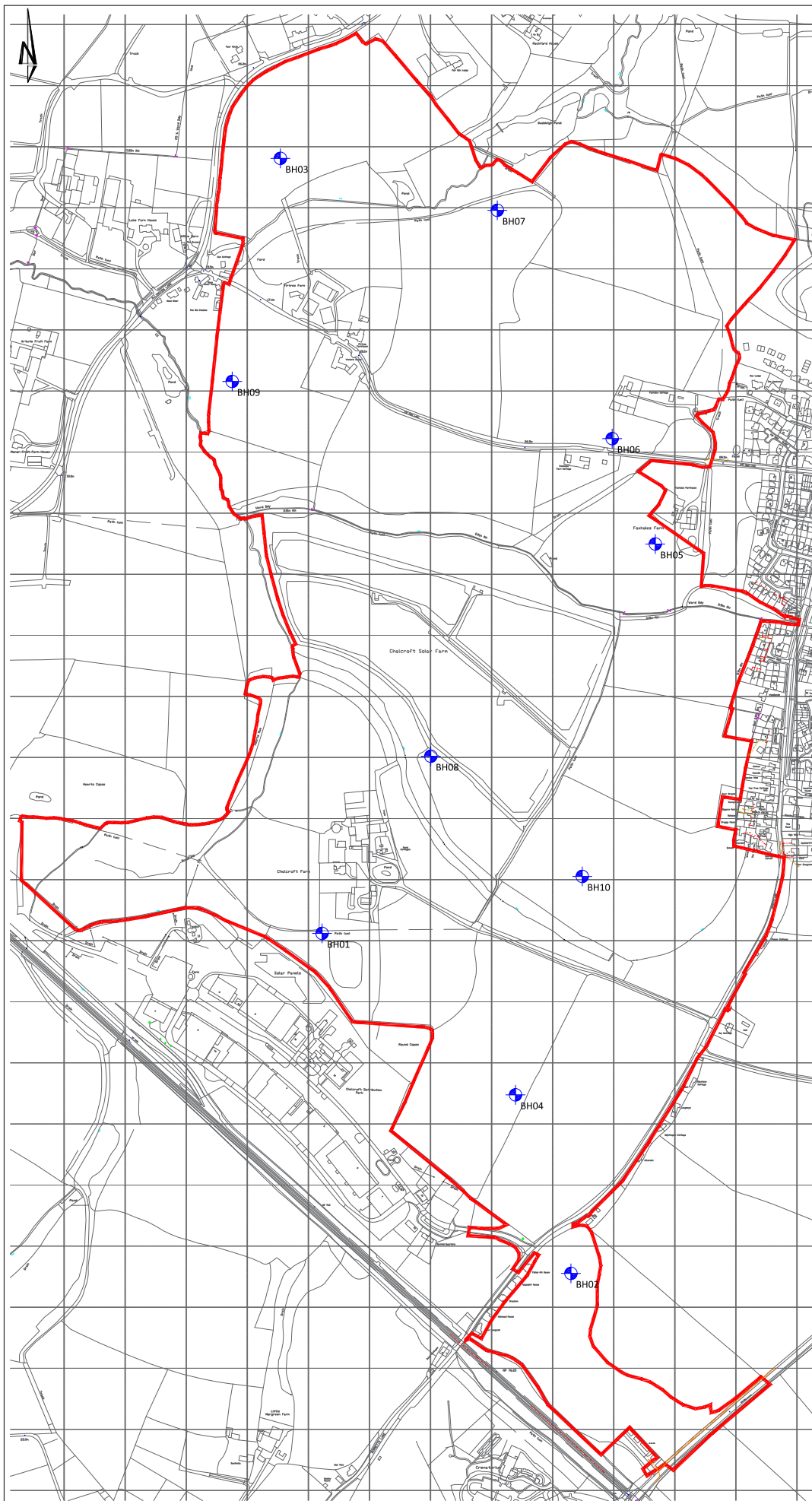
Groundwater levels recorded during post-fieldwork monitoring are summarised in Table 5.2.

Table 5.2: Groundwater level data summary

Exploratory hole	Date	Post-fieldwork monitoring	
		Depth to groundwater (m bgl)	Groundwater elevation (m OD)
BH01	02/11/18	2.41	17.79
BH02	02/11/18	2.77	29.66
BH03	02/11/18	1.95	18.22
BH04	02/11/18	2.70	20.88
BH06	02/11/18	1.95	25.85
BH07	02/11/18	3.04	19.57
BH08	02/11/18	0.93	18.67
BH09	02/11/18	1.60	15.86
BH10	02/11/18	2.31	20.37

5.2.2 Permeability tests

The results of permeability testing using falling head analysis were not suitable to allow conventional calculation of infiltration flow rates due to slow or no ingress of water within the test locations (with exception of a test at 3.0m in BH05, generating a infiltration rate of 3.85×10^{-6} m/sec). This is likely to be due to the cohesive strata encountered and subsequently identified shallow groundwater. The results sheets are given in Appendix F.



Notes:

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

Legend

- Site boundary (approximate)
- BHXX Cable Percussion Borehole

Rev	Date	Description	By	Chk
Architect				
 Hydrock Consultants Ltd Barton Road Barnstaple, North Devon PL4 8JL Tel: 01324 841000 www.hydrock.com				
Client				
Eastleigh Borough Council				
Project Title				
HORTON HEATH, HAMPSHIRE				
Drawing Title				
Exploratory Hole Location Plan				
Reference				
HHD-HYD-XX-ZZ-DR-GE-1001				
Hydrock Job No:				
C-09820-C				
Drawn	Checked	Scale @ A3	Date	Issue Date
SD	DP	1:3000	04/12/18	04/12/18
Revision		Status		
P1		S2		

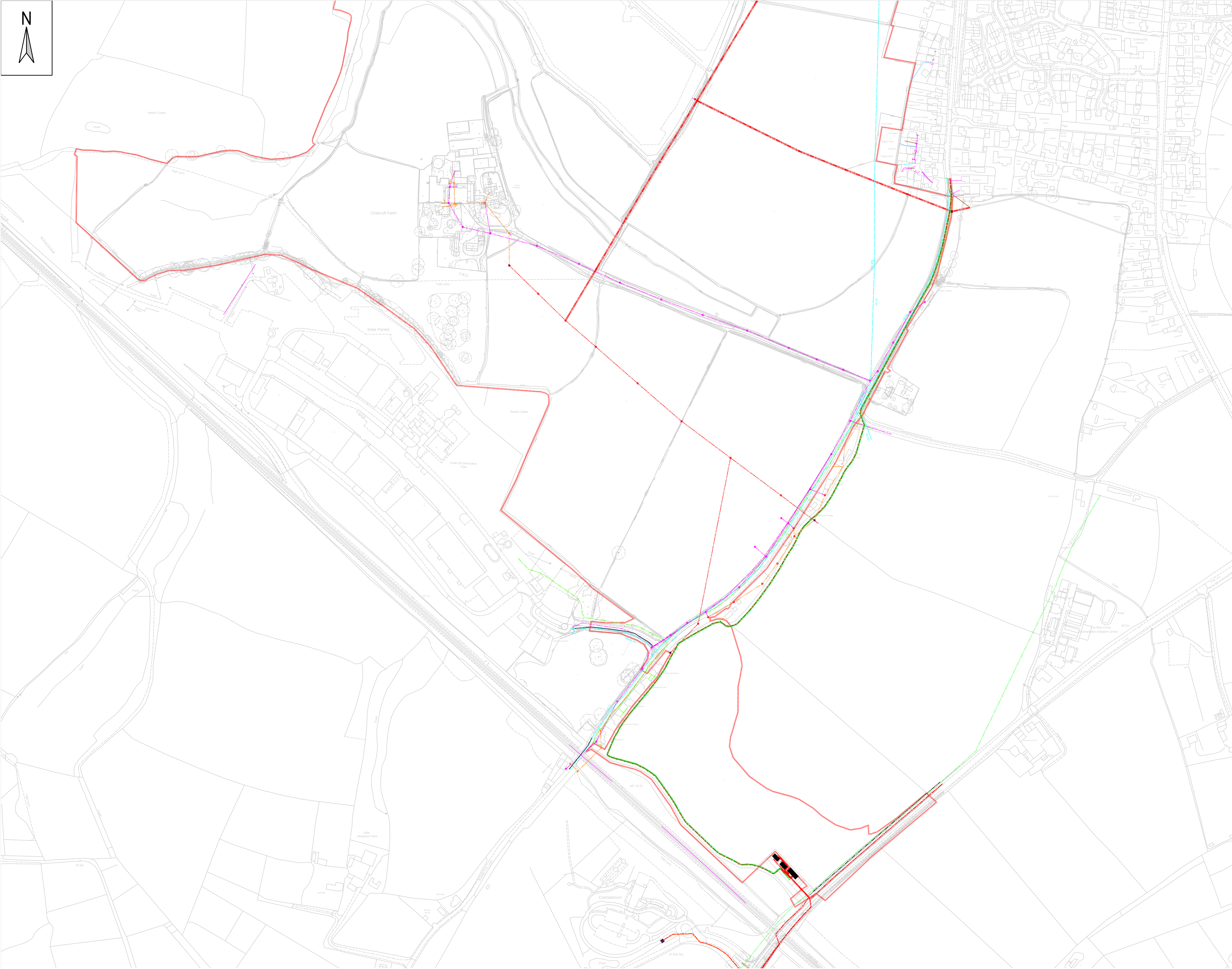
Hydrock www.hydrock.com						Cable Percussion		Borehole No. BH01 Sheet 1 of 1					
Project Name: Horton Heath						Co-ords: 448523E, 116512N		Hole Type: CP					
Location: Horton Heath, Hampshire				Project No: C-09820-C		Ground Level: 20.20m OD		Scale: 1:50					
Client: Eastleigh Borough Council						Date(s): 22/10/18		Hole Diameter: 150mm					
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description					
		Depth (m)	Type	Results									
		0.00-0.40 0.10	B ES		0.40	19.80		Soft to firm light brown sandy slightly gravelly SILT with rootlets. Sand is fine. Gravel is angular to rounded fine to coarse flint. (TOPSOIL)					
		0.50 0.60 0.60-1.30	D ES B					Firm orange brown slightly sandy slightly gravelly SILT. Sand is fine. Gravel is angular fine to medium flint. (HEAD DEPOSITS)					
		1.40 1.50-1.95	D U					30 Blows	Firm orange mottled grey CLAY/SILT (WITTERING FORMATION)				
		2.00	D	N=14 (2,3/3,3,4,4)	2.50	17.70		Firm grey mottled orange silty slightly sandy CLAY. Sand is fine. (WITTERING FORMATION)					
		2.40 2.50	D SPT					Firm grey brown to greyish orange thinly laminated fine sand and silty CLAY. (WITTERING FORMATION)					
		3.40 3.50 3.50	D D SPT					N=19 (3,3/5,5,4,5)	Firm grey very silty sandy CLAY. Sand is fine. (WITTERING FORMATION)				
		4.40 4.50-4.95	D U	45 Blows	4.40	15.80		Firm grey silty CLAY with sandy pockets. Sand is light greenish grey and fine. (WITTERING FORMATION)					
		5.00	D	N=28 (4,4/7,7,6,8)	7.40	12.80		Grey very sandy SILT. Sand is fine. (WITTERING FORMATION)					
		5.90 6.00 6.00	D D SPT					End of Borehole at 8.20m					
		7.40 7.50-8.00	D B				N=28 (3,4/7,6,7,8)	8.20	12.00				
		8.10 8.20 8.20	D D SPT										
		Remarks:		Inspection pit hand-dug to 1.2m bgl. Co-ordinates and elevation approximate. Falling head test conducted at 3.0 and 8.0mbgl						B = Bulk Sample D = Disturbed Sample U = Undisturbed Sample UT = Undisturbed Sample (Thin Wall) ES = Environmental Sample W = Water Sample PID = Photoionization Detector (ppm) SPT = Standard Penetration Test AB = Asbestos Bulk Sample			
		Groundwater:		No groundwater encountered.						Logged:	DAP	Checked:	AJ

Hydrock www.hydrock.com						Cable Percussion		Borehole No. BH04 Sheet 1 of 1			
Project Name: Horton Heath						Co-ords: 448840E, 116248N		Hole Type: CP			
Location: Horton Heath, Hampshire				Project No: C-09820-C		Ground Level: 23.58m OD		Scale: 1:50			
Client: Eastleigh Borough Council						Date(s): 15/10/18		Hole Diameter: 150mm			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.00-0.40	B		0.40	23.18		Soft light brown to brown slightly sandy slightly gravelly SILT with rootlets. Sand is fine. Gravel is angular to sub-angular fine to medium flint. (TOPSOIL)			
		0.00-0.40	ES								
		0.50	D								
		0.60-1.30	B	25 Blows	1.40	22.18		Brown to orangish brown slightly sandy slightly gravelly SILT. Sand is fine. Gravel is of sub-angular to sub-rounded fine to medium flint. (HEAD DEPOSITS)			
		1.40	D								
		1.50-1.95	U								
		2.00	D	N=15 (2,2/3,3,4,5)	2.40	21.18 21.08		Firm light grey mottled orange silty CLAY (WITTERING FORMATION) 2.00-2.40m becoming soft to firm and very silty.			
		2.40	D								
		2.50	D								
		2.50	SPT	50 Blows	3.40	20.18		Soft light grey mottled orange sandy SILT. Sand is fine. (WITTERING FORMATION) Firm brown to orange brown thinly laminated silty slightly sandy CLAY. Sand is fine. (WITTERING FORMATION)			
		3.40	D								
		3.50-3.95	U								
		4.50	D	N=23 (4,4/4,6,6,7)	4.50	5.0		Firm to stiff grey to dark grey thinly laminated fine sand and silty CLAY. (WITTERING FORMATION)			
		4.50	SPT								
		5.90	D								
6.00-6.45	U	60 Blows	6.50	7.0							
6.50	D										
7.30	D										
7.40	D	N=28 (3,3/7,7,6,8)	7.40	7.40							
7.40	SPT										
8.00	D										
			8.00	15.58		End of Borehole at 8.00m					
Remarks:		Inspection pit hand-dug to 1.2m bgl.						B = Bulk Sample D = Disturbed Sample U = Undisturbed Sample UT = Undisturbed Sample (Thin Wall) ES = Environmental Sample W = Water Sample PID = Photoionization Detector (ppm) SPT = Standard Penetration Test AB = Asbestos Bulk Sample			
Groundwater:		No groundwater encountered.						Logged:	DAP	Checked:	AJ

Horton Heath, Hampshire Hydrock Groundwater Monitoring Summary				
Location ID	Date	Ground Level	Groundwater level	
			m bgl	mAOD
BH01	02/11/2018	20.2	2.41	17.8
BH02	02/11/2018	32.4	2.77	29.7
BH03	02/11/2018	20.2	1.95	18.2
BH04	02/11/2018	23.6	2.7	20.9
BH05	02/11/2018	27.5	N/A	N/A
BH06	02/11/2018	27.8	1.95	25.9
BH07	02/11/2018	22.6	3.04	19.6
BH08	02/11/2018	19.6	0.93	18.7
BH09	02/11/2018	17.5	1.6	15.9
BH10	02/11/2018	22.7	2.31	20.4

APPENDIX F

Existing Services



Do not scale from this drawing.
Verify dimensions by site measurement.
Read this drawing in conjunction with the latest architectural and structural drawings.

This drawing is based on the following information:-

Notes

- Do not scale from this drawing.
- All dimensions are in millimetres unless stated otherwise.
- The service information given on this drawing is given without obligation or warranty. The accuracy thereof cannot be guaranteed. Any site based activity should be carried out in accordance with [HS\(G\)47 Avoiding Danger From Underground Services](#) and [HSE GS6 Avoiding Danger From Overhead Power Lines](#).
- Existing utility services taken from asset records aligned to topographical survey.
- The position of all apparatus should be verified independently prior to any invasive operation on site.

Legend

Electricity Services

- Site Boundary
- OH HV Cable
- HV Cable
- Substation
- OH LV Cable
- LV Cable
- Electric (HV) Pole
- Electric (LV) Pole

Water Services

- Water Main
- Washout/Fire Hydrant
- End Cap
- Valve

Gas Services

- LP Gas Main
- MP Gas Main
- Reducer
- End Cap
- Valve

BT Services

- OH BT Cable
- BT Duct Route
- BT Joint Box
- BT Pole

Virgin Media Services

- Virgin Media

Existing Drainage

- Existing Surface Water Sewer
- Existing Foul Water Sewer

General Services

- Existing CLH Pipeline
- Abandoned DIO Pipeline

P1	04/10/19	FOR INFORMATION	GP	NC
Revision	Date	Description	Drawn	Checked

HIM

hilsonmoran.com info@hilsonmoran.com

Client

Galliford Try Partnership Ltd

Project

Horton Heath

Drawing Title

Existing Services
Sheet 2 of 2

Scale	Sheet Size	Checked	Approved
1:2500	A1	NC	JH
Status			
For Information			26114
Drawing No.			Rev
26114-HM-ZZ-XX-DR-IF-0002			P1

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