

Geotechnical and Geo-environmental Site Investigation

PARCEL 15 – HOGWOOD FARM (FINCHWOOD PARK DEVELOPMENT)

CALA HOMES THAMES AND LEGAL & GENERAL HOMES LIMITED

15 MAY 2025

**PHASE 2
GEOTECHNICAL AND GEO-ENVIRONMENTAL
SITE INVESTIGATION**

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(FINCHWOOD PARK DEVELOPMENT)**

FOR

**CALA HOMES THAMES AND
LEGAL & GENERAL HOMES LIMITED**

ISSUE 8



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15 May 2025

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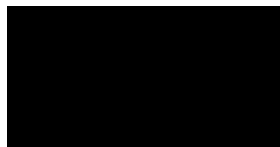
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1.0 EXECUTIVE SUMMARY

1. The site is part of the wider Finchwood Park Development, accessed off Park Lane around 1.5 km south east of Arborfield Garrison in Berkshire.
2. The site comprises an approximately 7.5 hectare area of former agricultural land surfaced with grass and other scrub vegetation.
3. The solid geology for the majority of the site is the London Clay Formation, however the overlying Bagshot Formation is indicated to be present in the east.
4. The London Clay is classified as Unproductive Strata, however the Bagshot Formation is classified as a Secondary A Aquifer. The site does not lie within a groundwater Source Protection Zone.
5. No radon precautions or ground gas protective measures are considered to be required.
6. The ground conditions comprise topsoil, generally over firm sandy clay deposits of the London Clay Formation. This is overlain in the east of the site by silty/clayey sand of the Bagshot Sand Formation.
7. Groundwater seepages were recorded in the boreholes at between 5 and 7.5 m, but were not encountered in any of the trial pits. However previous groundwater monitoring has suggested that shallow groundwater may be present, particularly during wetter months.
8. For the majority of the site, traditional strip and trench fill foundations are expected to be appropriate and founded at an expected minimum depth of 900 mm in natural clay strata.
9. Foundations will require deepening where within the influence of trees, in accordance with NHBC Standards Chapter 4.2. Heave precautions will be required wherever the foundation depth exceeds 1.5 m due to the influence of past or present trees, or for piled plots within the influence of trees.
10. Plots located near to mature trees around the perimeter of the site may need to be piled.
11. It is assumed that precast concrete floors with a minimum 150 mm high ventilated void beneath will be used. The ventilated void height will need to be increased to 250 mm where heave precautions are required.

12. Soakaways are not considered to be a viable form of surface water drainage due to the presence of cohesive strata.
13. Trial pits completed within the footprint of the former barn revealed made ground to depths of between 0.3 and 0.5 m bgl underlain by natural clay strata. The made ground was found to contain elevated concentrations of PAHs and a 600 mm capping layer of clean soil will therefore be required within gardens or areas of soft landscaping across the area of the former barns.
14. No sulphate precautions are required for concrete in contact with the shallow natural ground (i.e. <2.5 m bgl), however deeper below ground concrete will require DS-4 AC-4 sulphate precautions. Where below ground concrete is in contact with made ground a design sulphate class of DS-3 AC-3 will be required.
15. The conclusions made in this report are subject to agreement by the approving bodies and your warranty provider.

2.0 INTRODUCTION

2.1 Terms of Reference

This report presents the findings of a Phase 2 (intrusive) geotechnical and geo-environmental site investigation carried out by Eastwood & Partners (Consulting Engineers) Ltd for CALA Homes Thames and Legal & General Homes Limited. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

2.2 Context

Eastwood & Partners undertook a broader site investigation that encompasses Parcel 15 in 2017. Our report reference CAT/RAN/SAE/41623-002, dated 21 August 2017, should be read in conjunction with this report.

No other intrusive site investigations are known to have been undertaken on the site in the past.

2.3 Aims and Objectives

The aims and objectives of this investigation were as follows. To:

- Detail the ground conditions and their geotechnical properties enabling outline foundation proposals to be made for the proposed development;
- Carry out tiered risk assessment to establish the likely risks to future receptors, involving the use of generic assessment criteria and where unacceptable risks are identified, site specific assessment criteria within a detailed quantitative risk assessment;
- Identify feasible remediation options if unacceptable risks are highlighted; and
- Develop an appropriate remediation strategy where remediation is required.

2.4 Scope of Investigation

The investigation consisted of intrusive site works and laboratory analysis. The findings were used to test the conceptual model and produce a final risk assessment.

The intrusive works comprised the excavation of trial pits which were excavated to enable:

- Examination of the upper few metres of ground;

- In situ description of soils, enabling any localised lateral and vertical changes in soil conditions to be logged;
- Assessment of any contamination identified using visual and olfactory methods; and
- Collection of soil samples for geotechnical and chemical testing.

A number of cable percussion boreholes were also undertaken for the purposes of determining the ground conditions at depth to assist with pile design.

2.5 Limitations of Investigation

This report is based on the assumption that the north west area of the site will be developed with low-rise conventional housing with private gardens, areas of soft landscaping and associated infrastructure including roads and driveways. The remainder of the site is to be occupied by allotments and sports facilities. It is not thought that ground levels will be modified significantly. If this is not the case, further advice may be needed.

Where assessments of site areas affected in particular ways are given, these are approximate. All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, on the results of laboratory testing carried out as part of the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata and water conditions between or below investigation points. It should be noted that groundwater levels vary due to seasonal or other effects, and may at times differ from those measured during the investigation.

This report considers the ground and groundwater and does not cover any buildings or their fabric, or any existing hardstanding materials. Generally, testing has only been carried out for contaminants identified as potentially present with no assessment made of biological contamination. Risks to ecological receptors, such as bats, have not been considered.

3.0 SITE DESCRIPTION

Parcel 15 is part of the wider Finchwood Park Development. It is located approximately 1.5 km south east of Arborfield Garrison in Berkshire at grid reference 477544 164233. Access to the site is through the wider Finchwood Park Development site, off the sites haul road.

The site has an area of approximately 15 hectares, is irregular on plan and comprises open agricultural land with mature trees surrounding the perimeter and an old barn in the north west of the site. At the time of ECE's most recent visit to site in October 2023 construction works, including a new road and residential properties, had commenced in the north of the site.

The site varies in elevation from between 53 and 59 m AOD. Gentle slopes are present across different parts of the site. The northern area of the site slopes down to the north west at around 1 in 40, the central area slopes down to the west at around 1 in 80, the south east area of the site slopes down to the south west at around 1 in 30 and the south west area of the site is relatively level.

The site is bordered by partially developed parcel 14 to the north east and undeveloped parcels 11 to the north west and 16 to the south. Agricultural land also borders the site to the south west and east. A small group of commercial/industrial buildings is also present adjacent to part of the eastern boundary.

The information presented in this report relates solely to parcel 15 combined with the area of proposed allotments and sport facilities, and will herein be referred to as 'The Site'.

4.0 SUMMARY OF PHASE 1 ASSESSMENT

A Phase 1 assessment of the broader site (of which the subject site is a part of) was undertaken as part of our initial wider site investigation in 2017, reference 41623-002, and should be read in conjunction with this Phase 2 report. The pertinent points specifically relevant to the site are summarised in the sections below.

4.1 Site History

4.1.1 The Site

Historical mapping shows that the site has remained relatively unchanged agricultural land since the earliest maps dated 1876-1900. The barns in the west of the site first appear on aerial photographs in 1999. They are not shown on any previous Ordnance Survey maps, and only on one later map, dated 2017.

4.1.2 The Surrounding Area

The earliest historical maps, show the area surrounding the site is predominantly agricultural. Park Lane is present in its current location to east of the site and Finchampstead is located around 3.25 km to the south east.

In 1932 Arborfield Remount Depot is labelled around 750 m north west of the site, despite its extent remaining unclear. The 1961 historical map shows Arborfield Remount Depot has been renamed Arborfield Garrison, and extended up to the northern boundary of Hogwood Farm.

By 1938 a brickworks is shown approximately 640 m north west of the site, later developed as Hogwood Industrial Estate.

The 1984 map shows Hogwood Farm Industrial Estate in its current layout around 640 m to the north west of the site. By 1988 the attenuation pond between the two industrial estates is also shown.

A residential property is shown on the 1974-78 map bordering the east of the site. This is later labelled Shepperlands Cottage and Shepperlands Stables.

4.2 Geology

The majority of the site is shown to be underlain by the London Clay Formation. However, the overlying Bagshot Formation (sand) is shown to outcrop in the south east of the site. This

formation is noted to contain localised clay areas. Superficial deposits are not indicated and no faults are shown to cross the site.

4.3 Hydrogeology

The Envirocheck identifies the aquifer classification of the London Clay Formation as Unproductive Strata. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

The Bagshot Formation is classified as a Secondary A aquifer. These are rock layers with high permeability and can support local water supplies, and may be an important water source of rivers.

The site is not recorded as being within a groundwater Source Protection Zone.

4.4 Hydrology

The nearest surface water feature to be a drain located in the south of the site.

4.5 Ground Gas

The Envirocheck states that no radon protective measures are necessary in the construction of new dwellings.

No landfill sites are identified within 250 m of the site within the Envirocheck.

A number of infilled ponds are shown on historical maps of the wider Hogwood Farm site and are presumed to have been backfilled. The ponds were small features and are expected to have been shallow, and therefore the risk of significant gas generation and subsequent migration was considered to be low.

A significant depth of made ground (>2 m) is not anticipated beneath the site. Ground gas protective measures are therefore not considered to be necessary at this stage.

4.6 Potential Pollutant Linkages

The table overleaf details the possible sources and associated contaminants of concern, pathways and receptors which were identified by the Phase 1 report.

Source	Potential Contaminants	Potential Pathways	Potential Receptors
Made ground (if present)	- Heavy metals/metalloids and polycyclic aromatic hydrocarbons (PAHs) - Asbestos	Ingestion, inhalation, direct contact	- Future site occupants and visitors - Site construction workers - Plants
		Direct contact	Water supply pipes
		Migration through ground	Controlled waters
	Sulphates	Direct contact	Sub-surface concrete structures
Topsoil	- Heavy metals/metalloids and polycyclic aromatic hydrocarbons (PAHs) - Pesticides	Ingestion, inhalation, direct contact	- Future site occupants and visitors - Site construction workers - Plants
Natural ground	Sulphates	Direct contact	Sub-surface concrete structures

5.0 GROUND INVESTIGATION

5.1 Site Works

Eastwood Consulting Engineers visited site between 25 and 26 July 2017 and excavated three trial pits (TP30, TP32 and TP33) as part of the broader site investigation.

Eastwood CE revisited site between 20 and 22 October 2021 and completed twenty-seven trial pits (TP319 to TP330, TP343 to TP355, TP362 and TP364) across the site. These twenty-seven trial pits were undertaken across the area of proposed residential development and reached depths of between 0.8 m and 4.1 m below ground level (bgl).

During the visit the ground was noted to be soft and wet at the surface over a large area of the site. This resulted in the excavator becoming stuck and as a result the full area of the site was not able to be accessed during this round of investigation.

A further visit was made between 9 and 11 November 2021 when three cable percussion boreholes (BH09, BH10 and BH11) were completed to depths of 15 m bgl. An additional cable percussion borehole (BH104) was also then completed on 3 May 2022 to a depth of 20 m bgl.

ECE revisited site on 31 August 2022 and completed fifteen additional hand-excavated sampling pits (HP01 to HP04, HP14, HP15 and HP22 to HP30) to depths of between 0.1 and 0.5 m bgl across the site.

Following the demolition of the barns and lifting of the concrete slab in the north of the site ECE visited site 17 April 2023 to complete an additional four trial pits (TP601 to TP604) within the previously inaccessible area up to depths of between 0.6 m and 1.1 m bgl.

Copies of all exploratory hole logs are presented in Appendix 2, and their locations are plotted on the Exploratory Hole Location Plan (drawing number 41623/019 rev H) in Appendix 1.

5.2 Laboratory Testing

One sample of topsoil was despatched for testing as part of the 2017 site work.

Following the site visit in October 2021, seventeen samples of topsoil and eight samples of natural ground were dispatched for chemical testing. A further twelve samples of topsoil and six samples of natural ground were dispatched for testing following the additional hand excavated sampling completed on 31 August 2022.

A further five samples of made ground and four samples of natural ground were dispatched for chemical testing following the site work completed in April 2023.

Soil samples were taken in 500 g plastic tubs and 250 ml amber glass jars and were analysed at Chemtest Laboratories, using MCERTs accredited methodologies where available.

The chemical test results are presented in Appendix 4 and are discussed further in Sections 8 and 9.

Eight samples of natural ground were also dispatched for geotechnical testing at Geolabs. The geotechnical test results are presented in Appendix 4 and discussed further in Section 7.

6.0 GROUND CONDITIONS

6.1 Topsoil

All but four of the trial pits undertaken on the site encountered a surface covering of topsoil. This was noted as soft slightly sandy clay with frequent rootlets to brown silty sand beneath a cover of grass and scrub vegetation and was encountered to a depth of between 0.2 and 0.5 m bgl.

6.2 Made Ground

The surface covering in the former barn area in April 2023 was made ground comprising slightly silty sandy gravel to depths of between 0.3 and 0.5 m bgl. The gravel included brick, concrete, brick, plastic and occasional glass. A black membrane was encountered at the base of the made ground in TP604.

6.3 Natural Ground

Underlying any topsoil or made ground, the natural ground was typically found to comprise a soft to firm brown, orange and grey sandy clay locally with pockets of silty sand and was considered to be representative of the unweathered London Clay Formation. This was found to extended to a maximum depth of between 2.1 and 3.7 m bgl.

This progressed to a firm grey to dark grey sandy locally silty clay considered to be representative of the London Clay Formation. Within TP349 and TP352 the natural ground was recorded to be a slightly sandy clayey silt.

The London Clay Formation was also encountered in all four of the cable percussion boreholes (CP09 to CP11 and BH104). The weathered deposits were found to consist of brown silty sandy clay which was encountered down to depths of 3.3 to 4.0 m bgl. The unweathered London Clay Formation was encountered below these depths and was noted to comprise grey silty clay with occasional thin claystone bands before being terminated at depths of 15 m and 20 m bgl.

The base of this strata was not proven.

6.4 Obstructions

Soft and wet surface conditions were present over large parts of the site during the January 2022 investigation. The excavator was not able to access these areas. Therefore, there may be problems for plant movement during wetter times of the year.

No below ground obstructions were encountered and due to the history of the site, these would not be expected to be present.

6.5 Groundwater

All of the trial pits remained dry whilst open. Groundwater strikes were however, noted in boreholes CP09 and CP10 at depths of between 5 and 7.5 m bgl. No groundwater strikes were encountered in BH104.

ECE undertook a programme of groundwater monitoring across the wider Hogwood Farm site between July 2018 and June 2019. The results of this were reported on in our Groundwater Monitoring Report, reference 41623/007, dated 21 August 2019. A copy of this report is enclosed in Appendix 3. Two monitoring wells were located within the Parcel 15 site area and the peak groundwater level in both was recorded to be at ground level. Therefore, shallow groundwater may impact the excavation of trenches, particularly during wetter months.

Perched water was encountered within the made ground in TP604, it is thought that this was due to the presence of the membrane encountered at the base of the made ground, preventing surface water from percolating through to the underlying soil.

7.0 GEOTECHNICAL APPRAISAL

7.1 General

Our investigations indicate that the ground conditions comprise topsoil over natural sandy clay deposits of the London Clay Formation. Shallow groundwater was not encountered in any of the exploratory holes, but previous groundwater monitoring has indicated that shallow groundwater could be present.

7.2 Geotechnical Testing

Seven samples of natural ground were sent for geotechnical testing following the initial site work. The samples recorded modified plasticity indices of between 14.9% and 34% which correspond to a low to medium volume change potential. It is considered that the soils across the site should be assumed to be of medium volume change potential. The geotechnical test results are summarised in the table below:

Pit	Depth (m)	Geological Formation	Moisture Content	Liquid Limit	0.4 x Liquid Limit	Potentially Desiccated?	Modified Plasticity Index (%)	Volume Change Potential
TP320	1.7	LC	27.9	51	20.4	N	29	Medium
TP325	1.2	LC	26.3	55	22	N	34	Medium
TP329	3.2	LC	23.7	42	16.8	N	25	Medium
TP343	1.1	LC	24.1	31	12.4	N	14.9	Low
TP345	2.7	LC	27.1	53	21.2	N	33	Medium
TP348	3	LC	30.4	51	20.4	N	32	Medium
TP350	1.5	LC	24.4	44	17.6	N	28	Medium

LC = London Clay Formation

None of the samples were found to be significantly desiccated as the water content of the samples is greater than 40% of the liquid limit.

Following the drilling work in May 2022, undisturbed U100 samples were recovered and dispatched for geotechnical testing, including undrained triaxial testing and sulphate testing. The results are included in Geolabs report GEO/35548 a copy of which is included in Appendix 5 and summarised overleaf.

Location	Depth (m bgl)	Cell Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)
BH104	10	200	482	241
BH104	19	380	529	264

7.3 In-Situ Testing

In-situ SPT testing was undertaken in the cable percussion boreholes at 1.5 m intervals. The table overleaf summarises the N-values recorded at each borehole.

Strata	Average N-Value Recorded			
	BH09	BH10	BH11	BH104
Weathered London Clay	10.5	6.5	8	11.5
London Clay <10 m bgl	24.8	18.8	21	21.3
London Clay >10 m bgl	28.75	29.3	29	35.5

The table above shows that average N-values varied from 6.5 to 35.5 and increased with depth.

7.4 Foundations

For the majority of the dwellings, it is expected that traditional strip and trench fill foundations, taken onto natural non-desiccated cohesive strata of the London Clay Formation are expected to be appropriate.

The geotechnical testing has shown that the cohesive soils of the London Clay Formation should be assigned a medium volume change potential and therefore a minimum founding depth of 900 mm below existing or finished ground level (whichever the deeper) will apply. At this depth an allowable bearing capacity of 90 kN/m² is likely to be achievable. It is possible that further testing may demonstrate that the sandy soils of the Bagshot Formation have a lower volume change potential.

Foundations within or over clay soils will need to be deepened in accordance with NHBC Standards, Chapter 4.2 where past, present or proposed trees are within influencing distance of the foundation. Heave precautions should be included where the footing depth due to past or present trees is in excess of 1500 mm and for piled plots.

Consideration should be given to tree influence at an early stage. Buildings are likely to need to be piled wherever the depth due to trees exceeds 2.5 m.

Due to the possibility of shallow groundwater, particularly during wetter months, excavations should not be left open for prolonged periods. Methods such as dig and pour or sump and pump may be required to mitigate against shallow groundwater.

Piling may be required towards the perimeter of the site where mature trees are present. Given the site is generally surfaced with topsoil, and as obstructions were not encountered, it is expected that driven piles will be appropriate.

7.5 Ground Floors

It is assumed that a precast concrete floor, with a ventilated void beneath will be used. The void height should be at least 150 mm, increasing to 250 mm high where heave precautions are required.

7.6 Superstructure Precautions

Additional superstructure precautions are not considered to be required due to the ground conditions.

7.7 Excavation Problems

All of the trial pits remained dry and stable whilst open. Nonetheless, support will be required in accordance with current Health & Safety Regulations wherever access is required to trenches deeper than 1.2 m or less where there is risk of collapse.

7.8 Obstructions

Soft, wet surface conditions were encountered during the investigation which prevented access into a significant area of the site. This will need to be taken account of for the proposed development.

Given the site's former agricultural use it is not expected that significant below ground obstructions will be encountered.

7.9 Surface Water Drainage

Given the cohesive nature of the natural strata encountered, surface water drainage via ground soakage is unlikely to be viable for the proposed development.

7.10 Roadworks

Based upon the ground conditions observed a CBR value of at least 2% is likely to be applicable. It is recommended that CBR tests are undertaken along any proposed roads prior to construction so that accurate CBR values can be obtained. The ground should be assumed to be frost susceptible and a minimum construction thickness of 450 mm will therefore apply.

7.11 Limitations

To reiterate, the comments made above in relation to geotechnical analysis and design refer only to The Site specified in Section 3 of this report.

8.0 REFINEMENT OF OUTLINE CONCEPTUAL MODEL

8.1 Source Characterisation

An outline conceptual model, detailing the possible sources and associated contaminants of concern, potential pathways and receptors identified in the Phase 1 study was detailed in Section 4.6.

This section of the report documents the works undertaken to obtain information to test and refine this model enabling a risk assessment to be produced and, where significant risks are expected, remediation recommendations.

8.2 Ground Conditions

Our investigations indicate that the site is surfaced with topsoil over the weathered and unweathered deposits of the London Clay Formation. Groundwater seepages were encountered at between 5 and 7.5 m in the cable percussion boreholes.

8.3 Gas Precautions

No radon precautions are required at the site and no landfill sites were identified within 250 m. Made ground was not encountered therefore ground gas precautions are not considered to be necessary in the construction of new dwellings.

8.4 Unexpected Contamination

Visual and olfactory evidence of possible significant contamination was not encountered in any of the exploratory holes.

8.5 Chemical Testing

Following the initial site investigation, one sample of topsoil was despatched for chemical testing. The sample was analysed for the suite of contaminants listed below:

Contaminant Type	Actual Contaminants
Metals/Metalloids	Arsenic, cadmium, chromium (VI and total), lead, mercury, nickel, selenium, copper and zinc
pH	pH
PAHs	Speciated polycyclic aromatic hydrocarbons (PAH)
Sulphates*	Water soluble sulphate, total (acid soluble sulphate) and sulphur

*Not tested in topsoil.

Following on from the site work in October 2021, seventeen samples of topsoil and eight samples of natural ground were despatched for a standard suite of contaminants. Two samples of natural ground were also tested for fully fractionated petroleum hydrocarbons (TPH CWG) and one sample of topsoil was tested for total organic carbon and organochlorine and organophosphorus pesticides.

Following the site work in August 2022, a further twelve samples of topsoil and six samples of shallow natural ground were dispatched for speciated polycyclic aromatic hydrocarbon (PAH) testing. Eight topsoil samples were also screened for asbestos.

In April 2023, an additional five samples of made ground and four samples of natural ground taken from the former barn area in the north of the site, following the removal of the concrete floor slab. These were tested for the suite of contaminants listed in the table above.

8.6 Assessment Criteria

The end use of the site is intended to be developed for conventional dwellings with private gardens, road, areas of soft landscaping and associated car parking. Therefore, samples taken from the site have been compared against the assessment criteria for a residential end-use with homegrown produce.

Tables detailing the relevant assessment concentrations are included in Appendix 4.

8.7 Chemical Test Results

A copy of the chemical test results (Chemtest reports 17-1987, 21-37242, 22-33649 & 23-12734) are included in Appendix 4. Some preliminary risk assessment is undertaken in this section of the report where determinants can be readily discounted.

8.7.1 Topsoil

One sample of topsoil was analysed for total organic carbon (TOC) with a result of 0.5% being recorded. Therefore, the results have been compared against assessment criteria relating to 1% soil organic matter (SOM). It should be noted that the organic content recorded is considered to be low for topsoil and as a result the topsoil may not comply with the requirements for multipurpose topsoil in accordance with BS 3882:2015. Further testing would be required to confirm this.

Five of the seventeen samples of topsoil, collected in October 2021, recorded elevated concentrations of PAH compounds, these are summarised in the table below:

Sample	Recorded Concentration (mg/kg)		
	Benzo(b)fluoranthene	Benzo(a)pyrene	Dibenz(a,h)anthracene
TP343 – 0.2 m	6.2	5.9	0.73
TP347 – 0.3 m	4.2	3.7	0.55
TP349 – 0.5 m	2.9	2.4	0.43
TP350 – 0.1 m	3.1	2.5	0.42
TP353 – 0.3 m			0.28
Assessment Value (mg/kg)	2.6	2.2	0.24

A further twelve samples of topsoil were collected from the proposed residential area during the August 2022 hand pit sampling. None of these samples recorded any elevated concentrations when compared against the assessment criteria for a residential with homegrown produce end use.

Following the additional sampling and testing, modified mean values were calculated using all of the results from Parcel 15 for each of the compounds which were recorded as being elevated during the initial round of testing. A copy of the calculation sheets is in Appendix 4 and these are summarised in the table below:

PAH Compound	Modified Mean (mg/kg)	Assessment Value (mg/kg)
Benzo(b)fluoranthene	1.25	2.6
Benzo(a)pyrene	1.12	2.2
Dibenz(a,h)anthracene	0.21	0.24

The modified mean values for all three PAH compounds are demonstrated to be below the generic assessment values for residential with homegrown produce. It is therefore considered that these do not pose a significant risk to human health.

None of the topsoil samples recorded any further elevated concentrations with respect to the human health residential assessment values.

8.7.2 Barn Area

Five samples of made ground and four samples of the underlying natural ground were collected from below the footprint of the former barn in the residential area of the parcel during the site work in April 2023. All five of the made ground samples, and one of the samples of underlying natural ground recorded elevated concentrations of a number of PAHs when compared to the residential with homegrown produce assessment values. These are summarised in the table below:

Sample	Recorded concentration (mg/kg)						
	Benzo[a]anthracene	Chrysene	Benzo[b]fluoranthene	Benzo[a]pyrene	Dibenz(a,h)Anthracene	Phenanthrene	Indeno(1,2,3,c-d)pyrene
TP601 0.25 m	1.6	1.4	3.4	2.5	0.51	0.68	2.5
TP602 0.3 m	32	33	43	29	4	47	25
TP603 0.2 m	2.4	2.1	3.9	2.8	0.49	2.1	2.3
TP604 0.1m	57	58	75	54	6.3	110	46
TP604 0.25 m	5.9	4.6	8.4	7.3	1.2	6.7	5.2
TP604 0.8 m	3	2	3.7	3.4	1.9	1.3	3.6
Assessment value	7.2	15	2.6	2.2	0.24	95	27
	Made ground		Natural ground	3.9	Concentration exceeds assessment value		

None of the remaining samples of natural ground collected from below the former barn recorded any further elevated concentrations of contaminants.

8.7.3 Natural Ground

During the sampling in October 2021, two samples of natural ground recorded elevated concentrations of a number of polycyclic aromatic hydrocarbon (PAH) compounds. The elevated

concentrations are unexpected and do not occur in an isolated area of the site. The results were queried with the laboratory who confirmed that the reported results are correct.

The results have been analysed in accordance with their intended end use of residential with home grown produce and are summarised in the table below:

Sample	Recorded Concentration (mg/kg)		
	Benzo(b)fluoranthene	Benzo(a)pyrene	Dibenz(a,h)anthracene
TP349 – 3.3 m	4.2	3.3	0.55
TP352 – 2.9 m	2.6	2.5	0.26
Assessment Value (mg/kg)	2.6	2.2	0.24

A further six samples of natural ground were collected from the proposed residential area during the August 2022 sampling. None of these samples recorded any elevated concentrations when compared against the assessment criteria for residential with homegrown produce end use.

Modified mean values have been calculated using all of the results from the Parcel 15 for each of the compounds which were recorded as being elevated during the initial round of testing. A copy of the calculation sheets is in Appendix 4 and these are summarised in the table below:

PAH Compound	Modified Mean (mg/kg)	Assessment Value (mg/kg)
Benzo(b)fluoranthene	1.16	2.6
Benzo(a)pyrene	0.99	2.2
Dibenz(a,h)anthracene	0.2	0.24

The modified mean values for all three PAH compounds are demonstrated to be below the generic assessment values for residential with homegrown produce. It is therefore considered that these do not pose a significant risk to human health.

None of the remaining samples of natural ground recorded any further elevated concentrations of contaminants.

8.8 Sulphates

In accordance with BRE Special Digest 1 (2005), the site has been categorised as a greenfield location in relation to the Aggressive Chemical Environment. Groundwater is expected to be mobile through the near surface soils.

Eight samples of natural ground were scheduled for pH and sulphate testing. Water soluble concentrations varied from <10 mg/l to 85 mg/l. Total potential sulphate was recorded consistently as <0.03% with the exception of two samples (TP322 and TP348) which recorded 0.165% and 0.066% respectively. The pH ranged from 6.2 to 8.1.

The values for both water soluble sulphate and total potential sulphate for the natural ground samples fall into Design Sulphate Class DS-1 and the pH characteristic values fall into Aggressive Chemical Environment Class (ACEC) AC-1.

Two additional samples were tested from the cable percussion borehole, BH104, at depths of 5.5 m and 14.5 m bgl. Water soluble sulphate was recorded to be between 740 and 920 mg/l. Total potential sulphate was recorded to be between 1.32% and 5.4%, and the pH ranged from 8.2 to 8.5. The values for total potential sulphate in these deeper samples of unweathered London Clay fall into Design Sulphate Class DS-4 and the pH values fall into Aggressive Chemical Environment Class (ACEC) AC-4.

Five samples of made ground from below the location of the former barn in the west of the site, were scheduled for pH and sulphates. Water soluble sulphate concentrations ranged from 96 to 450 mg/kg. Total potential sulphate was recorded as between 0.33 and 1.29% with a characteristic value of 1.08%, and pH was recorded to range from 8.3 to 8.8. Based on the total potential sulphate and pH results a Design Sulphate Class of DS-3 and ACEC of AC-3 is considered to be appropriate for any below ground concrete in contact with the made ground in this area of the site.

8.9 Significant Pollutant Linkages

The following significant pollutant linkages have thus been identified:

Source	Potential Contaminants	Potential Pathways	Potential Receptors
PAHs in the area below the former barns	Polycyclic aromatic hydrocarbons (PAHs)	Ingestion, inhalation, direct contact	- Future site occupants and visitors - Site construction workers - Controlled waters
Sulphates in made ground and unweathered London Clay Formation	Sulphates	Direct contact	Deep below ground concrete

9.0 RISK ASSESSMENT

9.1 Human Health – Future Residents and Visitors

Following the initial site investigation completed at the site, five samples of topsoil and two samples of natural ground recorded elevated concentrations of three PAH compounds. The elevated concentrations were unexpected based on the history of the site as well as on the results of similar investigations undertaken across other land parcels within the wider site. The laboratory therefore undertook a quality assurance investigation into the reporting of the results and this concluded that *'the tests are within acceptable tolerances and we can find no evidence of either transcription errors or any indication of environmental contamination during the analytical process'*.

Modified mean values have been calculated for each of the elevated PAH compounds within both the topsoil and natural ground. Away from the former barn area all modified mean values for were found to be below residential with homegrown produce assessment values.

It is therefore considered that there is no significant risk to human health from the concentrations of PAHs within the topsoil or natural ground, and no remedial measures are considered necessary.

Barn Area

Elevated concentrations of a number of PAH compounds were recorded in the made ground in the former barn area in the north of the site. One sample of the underlying natural ground was also recorded to contain elevated concentrations of PAHs, however it is considered that this is likely a result of cross-contamination during the sampling process, rather than true elevated concentrations within the natural ground. Based on the testing undertaken, it is considered that the made ground is both physically and chemically unsuitable to remain at shallow depth in gardens or across areas of soft landscaping. This material should therefore be removed from garden and landscaped areas and either placed beneath areas of hardstanding (if deemed geotechnically suitable) or disposed of off-site. Alternatively, if the made ground remains in place in gardens and landscaped areas, a 600 mm capping layer of clean soil, including at least 100 mm of topsoil, will be required.

In order to confirm that the natural ground is not impacted by elevated concentration of PAH compounds in the vicinity of TP604, chemical testing of this should be undertaken within the gardens of plots 509 and 510 during verification of the capping layer.

9.2 Human Health – Construction Workers

Groundworkers employed during the construction phase of the development are most at risk of harm due to them having direct contact with affected soils. However, the contact is generally of short duration, and all competent ground workers will be aware of the potential risks associated with soils of this nature. Therefore, the overall risk to the health of construction workers is considered to be 'low'.

All groundworkers employed on the site should be made aware that elevated concentrations of contaminants are present within the topsoil and natural ground. Normal site procedures such as the wearing of gloves when handling soils, and the washing of hands prior to eating should be implemented at all times.

Any unusual, brightly coloured, ashy or odorous material or material suspected of containing asbestos encountered during construction should be brought to the attention of the site staff and investigated.

9.3 Gas Precautions

Ground gas precautions are not considered to be necessary.

9.4 Controlled Waters

Shallow groundwater was not encountered as part of this investigation but previous groundwater monitoring has identified the presence of shallow groundwater. Elevated concentrations of PAH compounds were recorded during the recent investigation however, these are not expected to be particularly soluble and there are no highly sensitive controlled water receptors nearby, therefore the potential risk is considered to be low.

9.5 Construction Materials

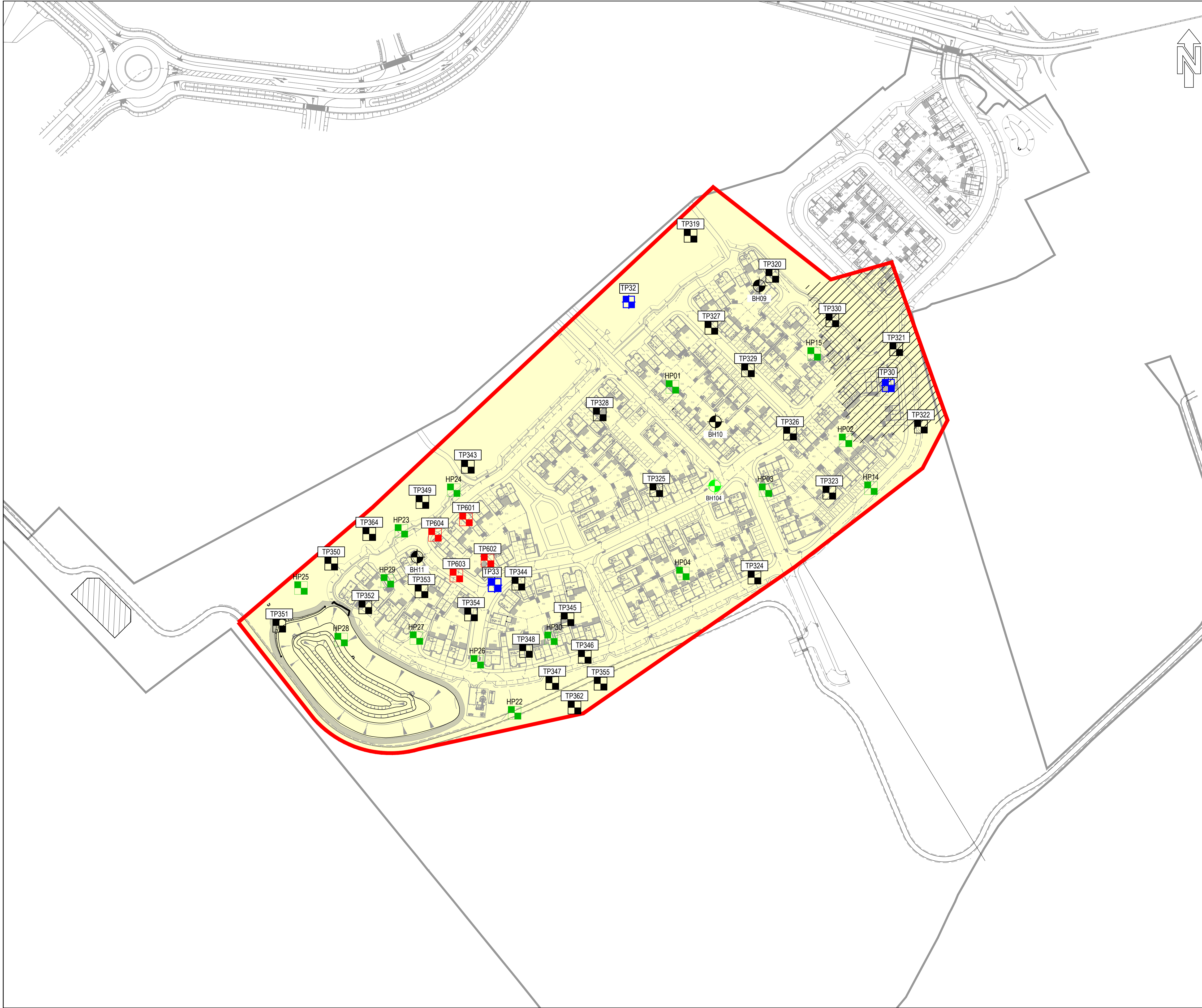
Based upon the results of the pH and sulphate testing discussed in Section 8, sulphate precautions are not required for below ground concrete in contact with the natural ground at depths of 2.5 m or less and DS-1 AC-1 concrete will be appropriate. However, the concentration of total potential sulphate was observed to increase significantly below this depth in the

unweathered London Clay Formation, and as a result, deeper concrete structures, e.g. piles, will require DS-4 AC-4 concrete.

Where below ground concrete is in contact with made ground within the footprint of the former barns, a design sulphate class of DS-3 and ACEC class of AC-3 should be adopted.

Appendix 1

Exploratory Hole Location Plan, drawing reference 41623/19 rev H



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

NOTES

KEY:

- Site Boundary.
- Approximate location of cable percussion borehole completed on behalf of Eastwood and Partners between 09.11.2021 and 10.11.2021
- Approximate location of trial pit completed by Eastwood and Partners between 20.10.2021 and 22.10.2021
- Approximate location of cable percussion borehole completed on behalf of Eastwood and Partners on 3rd May 2022.
- Approximate location of hand pit completed on behalf of Eastwood and Partners on 31st August 2022.
- Approximate area stripped of topsoil.
- Approximate area of land proposed for residential use.
- Approximate location of trial pit completed by Eastwood CE on 17 April 2023.
- Approximate location of trial pit completed by Eastwood CE between 25 and 26 July 2017.

H	Information removed from outside of proposed area for residential use.	LAD	AL	25.11.24
G	Updated to include latest trial pits and window samples.	DW	ME	09.11.2023
F	Topographical survey replaced with a site layout.	GT	RN	19.07.2023
E	Updated to include latest trial pits post site visit.	ST/TC	ME	11.05.2023
D	Updated to include latest trial pits.	GT	ME	07.03.2023
C	Updated to include site investigation work undertaken on 31st August 2022 and additional works information.	AS	ME	27.09.2022
B	Updated to include site investigation work undertaken on 3rd May 2022.	AS	EJD	22.06.2022
A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

CALA HOMES THAMES & LEGAL AND
GENERAL HOMES LTD

PARCEL 15, HOGWOOD FARM

EXPLORATORY HOLE LOCATION PLAN

Eastwood & Partners

CONSULTING ENGINEERS

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EOP

mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A1			DRAWING STATUS		
1:1000			INFORMATION		
DRAWN	CHECKED	DATE	DRAWING NUMBER	REV	
RB/AS	ME	12.01.21	41623/019	H	

Appendix 2

Trial Pit Logs (TP30, 32, 33, 319 to 330, 343 to 355, 362, 364 and 601 to 604)

Cable Percussion Borehole Logs (BH09 to 11 and 104)

Project Name
 Hogwood Farm

Project No.
 41623

Co-ords: -
 Level: -

Date
 27/07/2017

Location: Arborfield

Dimensions: -

Scale
 1:25

Client: Legal and General Homes

Depth
 2.70m

Logged By
 SAE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10	D		0.40			TOPSOIL: Grass over brown silty CLAY with roots and rootlets.	
						Orange mottled grey slightly gravelly silty SAND, assessed as medium density. Gravel is medium subangular to subrounded of flint.	
0.90	D		1.50			Firm to stiff orange brown mottled grey silty CLAY, with frequent gravel to cobble sized pockets of silt and silty sand.	1
1.60 1.60 1.60 1.60	IPP 1 IPP 2 IPP 3 D	125 125 125					
			2.70			Trialpit Complete at 2.70 m	2
							3
							4

Remarks: IPP= Penetrometer readings given as unconfined compressive strength in kN/m2

Groundwater: None encountered



Project Name
 Hogwood Farm

Project No.
 41623

Co-ords: -
 Level: -

Date
 27/07/2017

Location: Arborfield

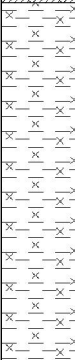
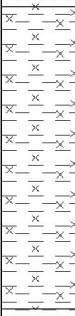
Dimensions: -

Scale
 1:25

Client: Legal and General Homes

Depth
 2.40m

Logged By
 SAE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10	D		0.20			TOPSOIL: Grass over brown silty CLAY with roots and rootlets.	
0.70	D					Stiff orange brown mottled grey silty CLAY with gravel to cobble sized pockets of silt. Friable in upper 0.5 m.	1
1.20 1.20 1.20 1.20	IPP 1 IPP 2 IPP 3 D	275 275 325	1.40			Stiff grey mottled brown slightly silty CLAY, with gravel to cobble sized pockets of silty clay.	2
			2.40			Trialpit Complete at 2.40 m	3
							4

Remarks: IPP= Penetrometer readings given as unconfined compressive strength in kN/m2

Groundwater: None encountered



Project Name
 Hogwood Farm

Project No.
 41623

Co-ords: -
 Level: -

Date
 27/07/2017

Location: Arborfield

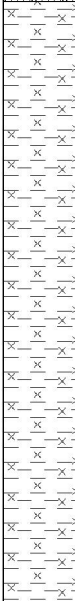
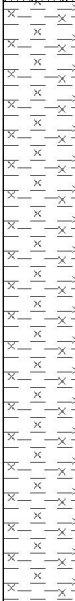
Dimensions: -

Scale
 1:25

Client: Legal and General Homes

Depth
 2.40m

Logged By
 SAE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10	D		0.40			TOPSOIL: Grass over brown silty CLAY with roots and rootlets.	
0.50	D					Stiff orange brown slightly silty CLAY, with gravel to cobble sized pockets of silty clay and sandy silt. Friable in upper 0.6 m.	
1.00	IPP 1				425		
1.00	IPP 2				425		
1.00	IPP 3				450		
1.10	D		2.40				

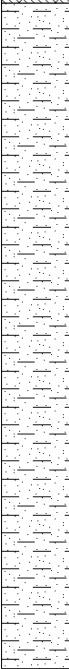
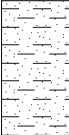
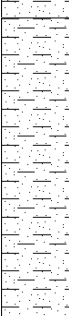
Remarks: IPP= Penetrometer readings given as unconfined compressive strength in kN/m2

Groundwater: None encountered



Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP319 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 20/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: £ 3.50m		Logged ME
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Dark brown slightly gravelly sandy SILT with frequent rootlets and pockets of light yellowish brown silty SAND. Gravel is fine to medium angular flint .	
						Soft to firm mottled orangish brown and grey sandy CLAY.	1
							2
			3.30			Stiff grey slightly sandy CLAY with rare shell fragments.	3
			3.50			Trialpit Complete at 3.500m	4
Remarks:							
Stability:							

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 4.00m	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft, brown, slightly sandy CLAY. Sand is fine to coarse.	
						Soft, brown and orange mottled grey slightly sandy CLAY with small flakes of carbonaceous material.	1
			2.50			Soft, brown and orange sandy CLAY. Sand is fine to coarse.	2
			3.00			Firm, dark grey slightly sandy CLAY. Sand is fine to coarse.	3
			4.00			Trialpit Complete at 4.000m	4

Remarks:	
Stability:	

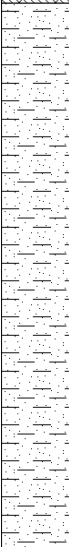
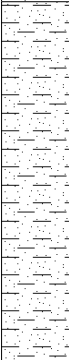
Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP321 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 21/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 3.10m		Logged EJD
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			Soft, brown, slightly sandy CLAY. Sand is fine to coarse.	
						Soft, grey mottled orange very sandy CLAY. Sand is fine to coarse.	
			2.50			Damp, light brown mottled orange sandy SILT. Sand is fine to coarse.	
3.10						Trialpit Complete at 3.100m	
Remarks:							
Stability:							

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.70m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft, brown, slightly sandy CLAY. Sand is fine to coarse.	
						Soft, grey and orange sandy CLAY.	
			1.60			Soft, orange and brown mottled grey slightly sandy CLAY. Sand is fine to coarse.	
			2.40			Brown and orange sandy SILT. Sand is fine to coarse	
			2.60			Firm, dark grey slightly sandy CLAY. Sand is fine to coarse. With lightish brown sandy Silt.	
			3.70			Trialpit Complete at 3.700m	

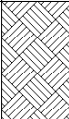
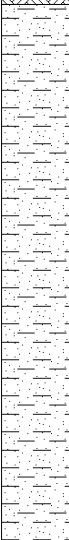
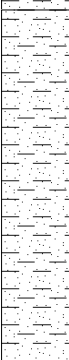
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.30m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft, brown slightly sandy CLAY. Sand is fine to coarse.	
						Orange and brown very sandy SILT. Sand is fine to coarse	1
			2.10				2
						Soft dark grey slightly sandy CLAY. Sand is fine to coarse	
			3.30				3
						Trialpit Complete at 3.300m	4

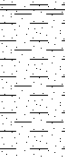
Remarks:	
Stability:	

Project Name Hogwood Farm	Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield	Dimensions: m		Scale 1:25
Client: Legal & General Homes	Depth: 3.40m	£	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Brown sandy SILT. Sand is fine to coarse	
						Soft grey and brown mottled orange slightly sandy CLAY. Sand is fine to coarse	1
			2.20			Soft, light greyish brown mottled orange sandy CLAY. Sand is fine to coarse	2
			3.40			Trialpit Complete at 3.400m	3
							4

Remarks:	
Stability:	

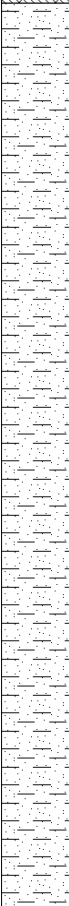
Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.40m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Soft, brown sandy CLAY. Sand is fine to coarse	
						Soft, brown and grey mottled orange sandy CLAY. Sand is fine to coarse	1
			2.90			Firm, brown and grey slightly sandy CLAY. Sand is fine to coarse	3
			3.40			Trialpit Complete at 3.400m	4

Remarks:	
Stability:	

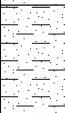
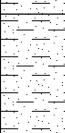
Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP326 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 21/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 3.10m		Logged EJD
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft brown sandy CLAY. Sand is fine to coarse	
						Soft brown and orange mottled grey slightly sandy CLAY. Sand is fine to coarse	
			2.60			Firm brown and grey mottled orange slightly sandy CLAY. Sand is fine to coarse	
						Trialpit Complete at 3.100m	
3.10							
Remarks:							
Stability:							

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.30m	Logged EJD

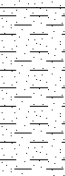
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Brown silty SAND. Sand is fine to coarse	
						Soft brown and orange mottled grey slightly sandy CLAY. Sand is fine to coarse	
			3.30			Trialpit Complete at 3.300m	

Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield		Dimensions: m		Scale 1:25
Client: Legal & General Homes		Depth: 3.50m		Logged EJD

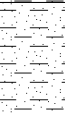
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	Level	
Depth (m)	Type	Results						
			0.20			TOPSOIL: Brown silty SAND. Sand is fine to coarse		
						Soft brown and grey mottled orange sandy CLAY. Sand is fine to coarse		1
			2.70			Soft brown and orange slightly sandy CLAY. Sand is fine to coarse	2	
					3.10		Firm, weakly foliated, lightish grey slightly sandy CLAY. Sand is fine to coarse	3
						3.50		Trialpit Complete at 3.500m

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield		Dimensions: m		Scale 1:25
Client: Legal & General Homes		Depth: 3.30m		Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL: Brown silty SAND. Sand is fine to coarse
						Soft brown and orange mottled grey slightly sandy CLAY. Sand is fine to coarse with soft, lightish grey pockets of Sand.
			2.50			Soft, brown and lightish grey slightly sandy CLAY. Sand is fine to coarse
			3.10			Firm brown and grey slightly sandy CLAY. Sand is fine to coarse
			3.30			Trialpit Complete at 3.300m

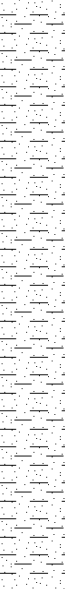
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 21/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.20m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Brown silty SAND. Sand is fine to coarse	
						Soft, orange and brown sandy CLAY with soft, lightish grey patches of Sand. Sand is fine to coarse	1
			2.80			Soft brown and orange sandy CLAY. Sand is fine to coarse	3
			3.20			Trialpit Complete at 3.200m	4

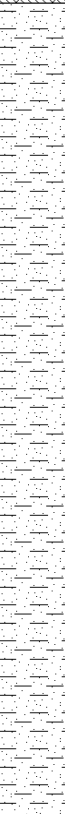
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.40m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL: Soft brown slightly sandy CLAY. Sand is fine to coarse	
						Soft brown and grey mottled orange slightly sandy CLAY. Sand is fine to coarse	1
			2.20			Soft brown and orange sandy CLAY. Sand is fine to coarse	2
			3.30			Firm darkish grey slightly silty sandy CLAY. Sand is fine to coarse	3
			3.40			Trialpit Complete at 3.400m	4

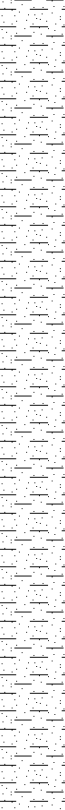
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield		Dimensions: m		Scale 1:25
Client: Legal & General Homes		Depth: 3.10m		Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft brown slightly sandy CLAY. Sand is fine to coarse	
						Soft brown and grey mottled orange slightly sandy CLAY. Sand is fine to coarse	1
			3.00			Soft brown and orange sandy CLAY. Sand is fine to coarse	3
			3.10			Trialpit Complete at 3.100m	4

Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.10m	Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Soft brown slightly sandy CLAY. Sand is fine to coarse	
						Soft brown and orange mottled grey slightly sandy CLAY. Sand is fine to coarse	1
			3.10			Soft brown and orange sandy SILT. Sand is fine to coarse	3
			3.40			Trialpit Complete at 3.100m	4

Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.80m	Logged EJD

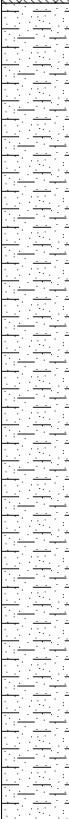
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft brown silty CLAY. Sand is fine to coarse	
						Soft brown and grey mottled orange slightly sandy CLAY. Sand is fine to coarse	1
			3.50			Soft darkish grey sandy CLAY. Sand is fine to coarse	2
			3.80			Trialpit Complete at 3.800m	3
							4

Remarks:	
Stability:	

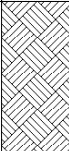
				TrialPit No TP347 Sheet 1 of 1			
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 22/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 3.30m E		Logged EJD

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL: Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of flint
						Soft brown and orange slightly sandy CLAY. Sand is fine to coarse
			2.30			Soft brown and orange mottled grey sandy CLAY. Sand is fine to coarse with flakes of fine to coarse subangular to angular of carbon.
			3.10			Soft darkish grey slightly silty sandy CLAY. Sand is fine to coarse
			3.30			Trialpit Complete at 3.300m

Remarks:	
Stability:	

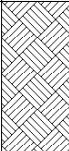
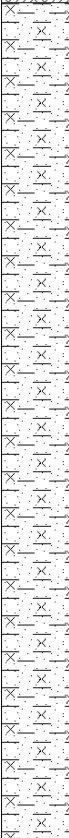
Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP348 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 22/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 3.00m		Logged EJD
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft brown silty CLAY. Sand is fine to coarse	
						Soft brown and grey mottled orange slightly sandy CLAY. Sand is fine to coarse	
			3.00				
						Trialpit Complete at 3.000m	
Remarks:							
Stability:							

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.70m	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.50			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Soft mottled orangish brown, brown and grey slightly silty sandy CLAY.	1
			3.40			Firm grey slightly sandy clayey SILT.	3
			3.70			Trialpit Complete at 3.700m	4

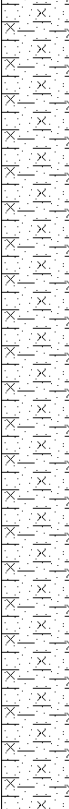
Remarks:	
Stability:	

Project Name Hogwood Farm	Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield	Dimensions: m		Scale 1:25
Client: Legal & General Homes	Depth: 3.50m	£	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.50			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Soft mottled orangish brown, brown and grey slightly silty sandy CLAY.	1
			3.30			Stiff grey silty CLAY.	3
			3.50			Trialpit Complete at 3.500m	4

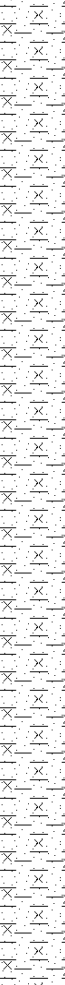
Remarks:	
Stability:	

Project Name Hogwood Farm	Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield	Dimensions: m		Scale 1:25
Client: Legal & General Homes	Depth: 3.00m	£	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.
						Soft to firm mottled orangish brown, brown and grey slightly silty sandy CLAY.
			3.00			Trialpit Complete at 3.000m

Remarks:	
Stability:	

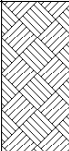
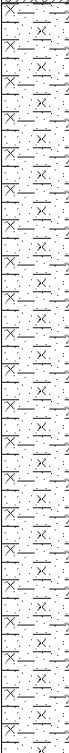
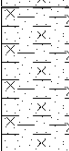
						TrialPit No TP352 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 22/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 4.10m E		Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Soft mottled orangish brown, brown and grey slightly silty slightly sandy CLAY.	1
			3.60			Firm grey slightly sandy clayey SILT.	2
			4.10			Trialpit Complete at 4.100m	3
							4

Remarks:

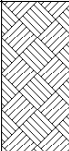
Stability:

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 3.50m	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.50			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Soft mottled orangish brown, brown and grey slightly silty sandy CLAY with rare fine to medium rounded flint .	1
			3.00			Soft mottled orangish brown, brown and grey slightly silty very sandy CLAY.	3
			3.50			Trialpit Complete at 3.500m	4

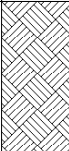
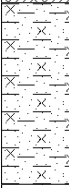
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 4.00m	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.50			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Firm mottled orangish brown, brown and grey slightly silty sandy CLAY with partings of grey sand. Sand is fine to coarse.	1
			3.70			Stiff grey very sandy CLAY.	3
			4.00			Trialpit Complete at 4.000m	4

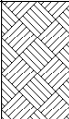
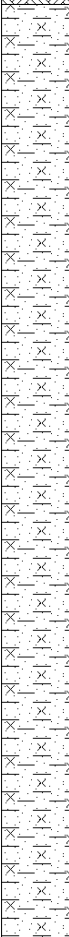
Remarks:	
Stability:	

Project Name Hogwood Farm		Project No. 41623	Co-ords: - Level:	Date 22/10/2021
Location: Arborfield			Dimensions: m	Scale 1:25
Client: Legal & General Homes			Depth: 1.10m	Logged ME

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.50			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
			1.10			Firm mottled orangish brown, brown and grey slightly silty slightly sandy CLAY. Sand is fine to coarse.	1
						Trialpit Complete at 1.100m	2
							3
							4

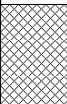
Remarks:	
Stability:	

Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP362 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 22/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 0.80m		Logged ME
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.35			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
						Soft to firm mottled orangish brown, brown and grey slightly silty slightly sandy CLAY.	
			0.80			Trialpit Complete at 0.800m	
							1
							2
							3
							4
Remarks:							
Stability:							

Eastwood&Partners CONSULTING ENGINEERS						TrialPit No TP364 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 22/10/2021
Location: Arborfield					Dimensions: m		Scale 1:25
Client: Legal & General Homes					Depth: 3.50m		Logged ME
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.40			TOPSOIL: Soft brown slightly silty sandy CLAY with rare flint gravel.	
			3.50				Soft to firm mottled orangish brown, brown and grey slightly silty slightly sandy CLAY. Relatively sandier with depth.
						Trialpit Complete at 3.500m	
Remarks:							
Stability:							

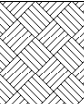
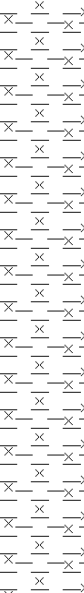
Eastwood CONSULTING ENGINEERS							TrialPit No TP601 Sheet 1 of 1		
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:			Date 17/04/2023	
Location: Arborfield					Dimensions: 1.00m			Scale 1:25	
Client: Legal & General Homes					Depth: 1.00m			Logged ME	
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.25			0.30			MADE GROUND: Dark grey and brownish yellow slightly silty sandy GRAVEL. Gravel is subangular fine to coarse flint concrete brick occasional plastic.			
0.50						Firm to stiff grey CLAY.			
			0.70			Stiff grey mottled orangish brown CLAY.			
1.00			1.00			Trialpit Complete at 1.000m		1	
									2
									3
									4
Remarks:									
Stability: Good									

Eastwood CONSULTING ENGINEERS							TrialPit No TP602 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 17/04/2023	
Location: Arborfield					Dimensions: 1.00m		Scale 1:25	
Client: Legal & General Homes					Depth: 0.60m		Logged ME	
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
0.30			0.35			MADE GROUND: Dark grey and brownish yellow slightly silty sandy GRAVEL. Gravel is subangular fine to coarse flint concrete brick occasional plastic.		
0.50			0.45			Firm grey sandy CLAY.		
			0.60			Stiff grey mottled orangish brown CLAY.		
						Trialpit Complete at 0.600m		
1 2 3 4								
Remarks:								
Stability: Good								

Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 17/04/2023	
Location: Arborfield					Dimensions: Depth: 1.10m 0.45m 1.00m		Scale 1:25	
Client: Legal & General Homes							Logged ME	
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
0.20			0.35 0.50			MADE GROUND: Dark grey and brownish yellow slightly silty sandy GRAVEL. Gravel is subangular fine to coarse flint concrete brick occasional plastic.		
0.45						Firm grey sandy CLAY.		
						Firm orangish brown mottled grey CLAY.		
1.10			1.10			Trialpit Complete at 1.100m		
Remarks:								
Stability: Good								

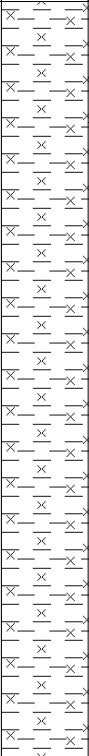
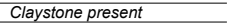
Eastwood CONSULTING ENGINEERS						TrialPit No TP604 Sheet 1 of 1	
Project Name Hogwood Farm			Project No. 41623		Co-ords: - Level:		Date 17/04/2023
Location: Arborfield					Dimensions: 1.00m		Scale 1:25
Client: Legal & General Homes					Depth: 0.80m		Logged ME
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10			0.20			MADE GROUND: Very dark grey slightly silty sandy GRAVEL.	
0.25						MADE GROUND: Brownish yellow slightly silty sandy GRAVEL. Gravel is subangular fine to coarse flint, concrete, brick and rare glass. Black membrane at base.	
						Firm orangish brown mottled grey sandy CLAY.	
0.80			0.80			Trialpit Complete at 0.800m	
							1
							2
							3
							4
Remarks: Black membrane encountered at 0.5 m bgl. Perched water above membrane.							
Stability: Good							

					Borehole Log			Borehole No. CP09 Sheet 1 of 2	
Project Name: Hogwood Farm					Project No. 41623		Co-ords: -		Hole Type CP
Location: Arborfield					Level:		Scale 1:50		Logged By EJD
Client: Legal & General Homes					Dates: 09/11/2021 - 09/11/2021				

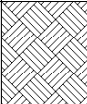
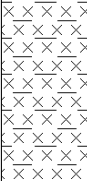
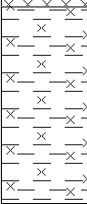
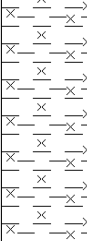
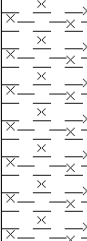
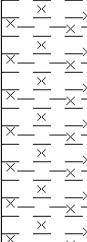
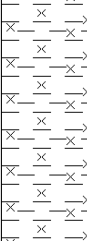
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.70			TOPSOIL: Soft brown clayey silty SAND	
		1.20		N=9 (1,1/2,2,2,3)			Brown silty sandy CLAY	1	
		2.50		N=12 (1,2/2,3,3,4)			Grey silty CLAY	2	
		4.00		N=22 (2,4/5,5,6,6)				3	
		5.50		N=25 (3,4/5,6,7,7)				4	
		7.00		N=25 (3,4/5,6,7,7)				5	
		8.50		N=27 (3,5/6,6,7,8)				6	
		10.00		N=24 (3,4/5,6,6,7)				7	
								8	
								9	
							10		

Continued on next sheet

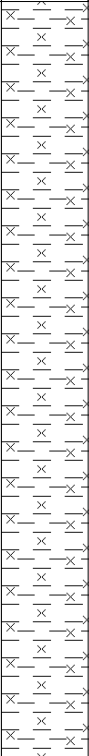
Remarks

				Borehole Log			Borehole No. CP09 Sheet 2 of 2		
Project Name: Hogwood Farm				Project No. 41623		Co-ords: -		Hole Type CP	
Location: Arborfield				Level:		Scale 1:50			
Client: Legal & General Homes				Dates: 09/11/2021 - 09/11/2021		Logged By EJD			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.50		N=26 (3,4/5,6,7,8)				 Claystone present	11
		13.00		N=31 (3,3/6,7,8,10)					12
		15.00		N=34 (4,6/7,8,9,10)					13
					15.00			End of borehole at 15.00 m	14
									15
									16
									17
									18
									19
									20
Remarks									

					Borehole Log			Borehole No. CP10 Sheet 1 of 2	
Project Name: Hogwood Farm					Project No. 41623		Co-ords: -		Hole Type CP
Location: Arborfield					Level:		Scale 1:50		Logged By EJD
Client: Legal & General Homes					Dates: 10/11/2021 - 10/11/2021				

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.70			TOPSOIL: Brown clayey silt and sand	
		1.20		N=5 (1,1/1,1,1,2)	2.00		Brown clayey sand and clayey silt	1	
		2.50		N=8 (1,1/1,2,2,3)	3.30		Brown sandy silty CLAY	2	
		4.00		N=14 (1,2/3,3,4,4)			Grey silty CLAY	3	
		5.50		N=16 (1,3/3,3,5,5)			Delayed Water Strike. In 20 minutes rose to 4.1	4	
		7.00		N=18 (2,3/3,4,5,6)				5	
		8.50		N=27 (3,5/5,6,8,8)				6	
		10.00		N=28 (2,4/5,7,8,8)				7	
									8
									9
Continued on next sheet								10	

Remarks	
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					Borehole Log			Borehole No. CP10 Sheet 2 of 2	
Project Name: Hogwood Farm					Project No. 41623		Co-ords: -		Hole Type CP
Location: Arborfield					Level:		Scale 1:50		Logged By EJD
Client: Legal & General Homes					Dates: 10/11/2021 - 10/11/2021				
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.50		N=28 (3,5/6,7,7,8)					11
		13.00		N=30 (4,5/7,7,8,8)					12
		15.00		N=31 (4,5/6,7,8,10)	15.00				13
							End of borehole at 15.00 m		14
									15
									16
									17
									18
									19
									20
Remarks									

Borehole Log

Borehole No.

CP11

Sheet 1 of 2

Project Name: Hogwood Farm

Project No.
41623

Co-ords: -

Hole Type
CP

Location: Arborfield

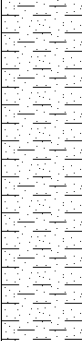
Level:

Scale
1:50

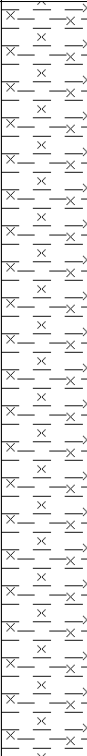
Client: Legal & General Homes

Dates: 11/11/2021 - 11/11/2021

Logged By
EJD

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.20		N=6 (1,1/1,2,1,2)	0.50			MADE GROUND: Brown clayey sand and silt	1
								Brown clayey SAND	
								Brown silty sandy CLAY	
		2.50		N=10 (1,1/2,2,3,3)	3.30			Grey silty CLAY	2
									
									
		4.00		N=19 (2,4/4,4,5,6)					3
									
									
		5.50		N=20 (3,4/4,5,5,6)					4
									
									
7.00		N=22 (3,4/5,5,6,6)					5		
									
									
8.50		50 (8,17/50 for 75mm)					6		
									
									
9.00		N=23 (3,4/5,5,6,7)					7		
10.00		N=24 (3,4/5,6,6,7)					8		
Continued on next sheet								10	

Remarks

				Borehole Log			Borehole No. CP11 Sheet 2 of 2		
Project Name: Hogwood Farm				Project No. 41623		Co-ords: -		Hole Type CP	
Location: Arborfield				Level:		Scale 1:50			
Client: Legal & General Homes				Dates: 11/11/2021 - 11/11/2021		Logged By EJD			
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.50		N=30 (4,5/6,8,8,8)	15.00				11
		13.00		N=30 (2,5/6,8,8,8)					12
		15.00		N=32 (4,5/6,8,9,9)					13
									14
									15
								End of borehole at 15.00 m	16
									17
									18
									19
									20
Remarks									

Borehole Log

Borehole No.

BH104

Sheet 1 of 2

Project Name: Hogwood Farm

Project No.
41623

Co-ords: -

Hole Type
CP

Location: Arborfield

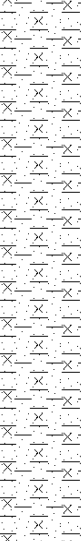
Level:

Scale
1:50

Client: Legal & General Homes

Dates: 03/05/2022 - 03/05/2022

Logged By
Driller

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			Grass over TOPSOIL.	
		1.20		N=10 (1,1/2,2,3,3)				Brown silty sandy CLAY.	1
		2.50		N=13 (1,2/3,3,3,4)					2
		4.00		N=16 (2,3/3,5,4,4)	4.00				3
		5.50		N=22 (3,3/4,5,6,7)					4
		7.00		N=22 (3,4/4,5,6,7)					5
		8.50		N=25 (2,4/4,6,7,8)					6
		10.00 - 10.45	U						7
									8
									9
									10
								Continued on next sheet	

Remarks

Borehole Log

Borehole No.

BH104

Sheet 2 of 2

Project Name: Hogwood Farm

Project No.
41623

Co-ords: -

Hole Type
CP

Location: Arborfield

Level:

Scale
1:50

Client: Legal & General Homes

Dates: 03/05/2022 - 03/05/2022

Logged By
Driller

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.50		N=32 (4,5/7,8,8,9)					11
		13.00		N=47 (4,5/6,23,8,10)					12
		14.50		N=35 (5,5/8,8,9,10)					13
		16.00		N=25 (3,5/5,6,7,7)					14
		17.50		N=35 (4,5/7,8,10,10)					15
		19.00 - 19.40	U						16
		20.00		N=39 (5,5/8,8,11,12)	20.00				17
									18
									19
									20

End of borehole at 20.00 m

Remarks

Appendix 3

Groundwater Monitoring Report

Legal & General Homes Communities
One Coleman Street
London
EC2R 5AA

21 August 2019

Hogwood Farm, Arborfield – Groundwater Monitoring Report

We are writing to report on the groundwater monitoring which was undertaken at this site between July 2018 and June 2019.

Monitoring visits

Monthly visits were undertaken by E&P during which, monitoring of the water depth in each of the twenty-two installed monitoring wells was undertaken. WS22, located in the SANG area in the southern part of the site could not be located and was not monitored during any of the visits. All remaining wells (WS1 to WS21 and WS23) were monitored on at least one occasion. The occasions during which monitoring could not be undertaken are listed in the table below, along with the corresponding reasons.

Monitoring well	Dates not monitored	Reason
WS2	June 2019	Well destroyed/buried by ongoing construction works in the vicinity
WS4	July to August 2018	Could not locate
WS11	December 2018 to June 2019	Well destroyed/buried during archaeological works in the vicinity
WS15	June 2019	Well monitored but found to be dry and silted up to 1.15 m
WS22	All	Could not locate well, suspect it was not installed
WS223	December 2018 to June 2019	Well destroyed/buried during archaeological works in the vicinity

In addition to the above, no monitoring was undertaken during November 2018.

Monitoring Results

The monitoring commenced in July 2018 where the water level was recorded to be between 1.2 m and 2.1 m below ground level (bgl) across the site. The water levels then dropped to

their deepest in September 2018 where they were found to be between 1.2 m and 2.7 m bgl. The levels then rose to a peak in March 2019 where the levels were found to be between 0.0 m and 0.96 m bgl. As expected, the levels then fell towards June 2019, although small rises were recorded in a few wells between May and June.

A copy of the spreadsheet outlining the monitoring results is attached along with a graph demonstrating the annual cyclical nature of the water levels.

Interpretation of Results

From the results recorded we have produced two plans showing the groundwater contours across the site;

- Drawing 41623/005 – Groundwater Monitoring Locations with Highest Water Depths; and
- Drawing 41623/006 – Groundwater Monitoring Locations with Lowest Water Depths

Copies of the plans are enclosed. These both show a similar trend with water levels being highest in the north west and north east, falling south east and south west respectively, towards the centre of the southern area of the site.

The enclosed Ordnance Survey (OS) plan shows a large number of surface watercourses and ponds both on the site and in the surrounding area. The OS extract which covers a wider area also shows a large number of surface water features, including the Blackwater River located around 550 m south of the site. A surface water drain/stream is indicated to run through the site, exiting at the centre of the southern boundary of the site. This then turns south west and flows directly to the Blackwater River. This is therefore consistent with the contours plotted from the water monitoring, which indicate the water levels to fall towards the drain/stream.

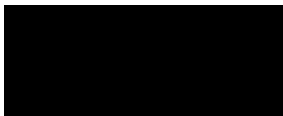
The elevation of the site is between around 52 m AOD in the south and east to around 60 m AOD in the north. The Blackwater River lies at an elevation of around 50 m AOD. It is therefore not unexpected that the groundwater is encountered at shallow depth below the site. The water depths recorded are therefore considered to represent the true groundwater level, and not a perched water table.

Conclusion

Water monitoring of twenty-two monitoring wells across the site over twelve months between July 2018 and June 2019 has demonstrated an annual cyclical pattern with water levels being

shallowest towards the end of the winter period/beginning of spring and deepest towards the end of the summer period/beginning of autumn. The water levels were observed to be relatively shallow, with water recorded at the surface on a few occasions in a small number of wells. Contour plans have been produced which indicate the groundwater is flowing towards a surface water drain/stream which exits the centre of the southern boundary of the site and flows towards the Blackwater River. The values recorded are considered to be representative of the true groundwater, and not a perched water table.

Yours sincerely

A solid black rectangular box used to redact the signature of Catherine Topliss.

Catherine Topliss

Enc. Monitoring results spreadsheet
 Graph of monitoring results
 Drawings 41623/005 and 41623/006
 Ordnance Survey Plan and Ordnance Survey Extract

Groundwater Monitoring Results Table

Monitoring well	Water level (mbgl)											Depth (m bgl)
	18/07/2018	17/08/2018	19/09/2018	17/10/2018	12/12/2018	14/01/2019	14/02/2019	15/03/2019	15/04/2019	15/05/2019	17/06/2019	
WS1	1.42	1.55	1.87	1.32	0.97	0.85	0.54	0.54	0.73	0.92	1.06	2.9
WS2	1.7	1.82	2.01	2.17	2.37	1.99	0.6	0.53	1.05	1.27		2.8
WS3	1.99	2.39	2.74	2.69	1.97	1.3	1.08	0.96	0.89	1.03	1.12	3
WS4			2.33	2.06	1.82	0.87	0.5	0.28	0.55	1.05	1.28	3.7
WS5	1.8	1.96	2.08	1.9	1.65	1.35	0.8	0.78	0.94	1.3	1.36	3.6
WS6	1.8	2.34	2.54	2.57	1.75	0.86	0.66	0	0.68	0.85	0.94	3.8
WS7	1.4	1.65	1.81	1.78	0.6	0.89	0.5	0.6	0.84	1.09	1.2	3.6
WS8	1.5	1.74	1.9	1.68	0.81	0.91	0.71	0.47	0.9	1.14	1.14	2.8
WS9	1.2	1.33	1.44	1.46	0.85	0.93	0.77	0.54	1.02	1.09	0.96	3.9
WS10	1.5	1.71	1.87	1.87	1.4	1.07	0.61	0.75	1.14	1.28	1.31	2.8
WS11	1.71	1.94	2.18	2.33								2.5
WS12	2.12	2.43	2.57	1.9	1.38	0.9	0.38	0.73	0.91	1.06	1.11	2.9
WS13	1.4	1.7	1.7	1.25	0.87	1.22	0.97	0.74	1.06	1.2	1.21	1.8
WS14	1.44	1.84	2.1	1.79	1.41	1.18	0.62	0.78	0.96	1.15	1.41	2.9
WS15	1.2	1.2	1.2	0.23	0.48	0.65	0.33	0.62	0.88	1.16		1.3
WS16	1.41	1.63	1.64	1.63	1.49	0.82	0.4	0.35	0.54	0.86	0.6	1.6
WS17	1.76	2.05	2.38	2.59	2.7	1.7	0.97	0.9	1.08	1.23	1.21	2.7
WS18	1.42	1.6	1.6	1.6	0.94	0.53	0.15	0	0	0.23	0.43	2.7
WS19	1.5	1.68	1.76	1.86	0.74	0.52	0.1	0	0.59	0.94	0.79	3.5
WS20	1.47	1.76	1.94	2.05	0.99	0.97	0.05	0	0.37	0.88	0.9	2.9
WS21	1.75	2.14	2.49	2.3	0.86	0.41	0.31	0.2	0.55	0.91	0.62	3.3
WS22												3.6
WS23	1.4	1.59	1.81	1.85								2.9

17/06/2019

WS2 - Destroyed/buried

WS15 - Dry (silted up to 1.15 m)

Water depth over time

