

**Ground Investigation Report
with Preliminary Geotechnical Proposals**

**Land at Cottage Farm
Lovedean Lane
Lovedean
Hampshire**

Client

Bargate Homes Limited

J19042

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EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

Following on from our initial Desk Study Report, this report describes the findings of a multiphased ground investigation carried out by the Wilson Bailey Partnership on the instructions of Bargate Homes Limited with respect to the proposed residential development of this site. The purpose of the investigation has been to investigate the ground conditions and assess the implications of the findings with regards to geotechnical design and land contamination.

DESK STUDY SUMMARY

The previously reported desk study concluded that the historical and ongoing current use of the site as open agricultural land is not considered to be potentially contaminative, although the site is in a particularly sensitive setting with regards to groundwater risks.

The site was also identified as being in a geological and topographical setting that is particularly prone to the formation of chalk dissolution features and the site walkover survey and historical data searches had indicated the presence of a number of chalk dissolution features within the site boundaries and in close proximity to the site.

Whilst the site is not considered to pose a significant risk at present and whilst the proposed residential development will not introduce significant additional sources of contamination, the proposed development will need to take account of the anticipated geologically compromised ground conditions.

GROUND CONDITIONS

The multiphased ground investigation comprised an initial phase of geophysics surveying using a range of techniques to identify and map the variation of the near surface geology and the presence and extent of areas of lower than expected density chalk, which could be indicative of chalk dissolution features.

A number of features were identified as part of these works and described within the specialist geophysics report included in Appendix A to this report.

Subsequently two phases of targeted ground investigation were carried out in order to physically investigate the nature and extent of the identified anomalies from the geophysics assessment. The ground investigation has comprised a series of boreholes to depths of up to 8 m below ground level, together with dynamic probes to depths of up to 20m below ground level.

- Phase 1 of the physical investigation comprised 90 dynamic probes;
- Phase 2 of the physical investigation comprised 57 dynamic probes and shallow small diameter boreholes.

Soil contamination testing has been carried out on selected samples of the near surface soils recovered from the boreholes drilled within Phase 2 of the site investigation, with the testing suite encompassing a wide range of routine potential chemicals of concern and environmental indicators.

GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

The geophysical assessment and the physical investigation have confirmed the anticipated ground conditions in that variable ground conditions have been encountered at this site, including competent chalk, soft alluvial soils, firm clay soils of the Lambeth Group and areas of compromised ground.

The compromised ground has been found to include areas where historical chalk dissolution collapse features have been identified, with soft clay infill and completely weathered weak chalk. Areas of compromised softened and weakened chalk have also been encountered, which could be indicative of potential future risk chalk dissolution zones. Some of the features identified by the geophysical assessment have however been discounted on the basis of the physical assessment, with inferred anomalies identified as being associated with an increased water content within the chalk above laterally consistent bands of flint.

More detailed discussion of the geotechnical aspects of the site is provided within the main body of text to this report, although in summary, parts of the site have been identified where it is not viable to construct new dwellings

or associated infrastructure. Across the remainder of the site construction is considered viable in accordance with a detailed design philosophy which should mitigate the risk of ground settlement or collapse. This design approach includes the use of reinforced raft foundations designed to span over a precautionary void, together with geotextile reinforced pavement construction and positive outflow drainage to all areas of hardstanding, including garden paths, shed bases and terraces in order to control and minimise the potential for future ground instability.

The findings of the overall ground investigation have also been used to support the civil engineering design of the proposed scheme, which incorporates a series of surface water management features that will help to mitigate the risk of future chalk dissolution features forming at this site, such that the proposed development should improve the geotechnical stability of this land parcel.

Soakage testing has not been carried out as part of this ground investigation as it has been concluded that the formation and use of soakaways at this site is not suitable due to the risks associated with chalk dissolution.

The extensive multiphased ground investigation has identified areas of geotechnically compromised ground together with areas where development may proceed in accordance with a precautionary foundation design strategy. This strategy entails the construction of raft foundations to proposed buildings that are designed to span over a potential under plot void and retain the structural integrity of the proposed new building.

Road pavements are to be constructed to include substantial geo-fabric reinforcement that is designed to support the road surface in the event of collapse or settlement of the ground. Services and utilities are to be designed to resist any settlements and cracking associated with any potential ground movements.

GEOENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

The historical use of the site is not considered to be potentially contaminative and the ground investigation has not indicated the presence of elevated concentrations of a wide range of potential soil contaminants such that contaminated land related remediation is not considered necessary.

The site is identified as being within a particularly sensitive hydrogeological setting. In addition to mitigating the risk of future chalk dissolution, the findings of the ground investigation have been used to provide additional input to the civil engineering design of the proposed scheme in order to mitigate the potential risk of development related potentially mobile contaminants of concern such as silts and fuel related contaminants from entering the ground and the groundwater.

FURTHER WORK

In accordance with best practice for redevelopment of any site, a geo-environmental watching brief should be maintained during the ground works phase of the development in order that should any suspicious or contaminated soils be encountered, they may be investigated, assessed and remediated as necessary under the supervision of Wilson Bailey Partnership and in conjunction with the Local Authority.

A detailed geotechnical watching brief will need to be maintained and be documented in order to confirm the inspections and proof rolling proposals are completed for each plot.

Part 1: INVESTIGATION REPORT

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 INTRODUCTION

Following on from the completion of a Desk Study Report (report reference J19042 dated January 2020) the Wilson Bailey Partnership has been commissioned by Bargate Homes Limited to carry out a multiphased ground investigation of a parcel of land associated with Cottage Farm, Lovedean Lane, Lovedean.

1.1 Proposed Development

Consideration is currently being given to the development of the site through the construction of a residential scheme comprising a combination of two storey houses and blocks of apartments together with garages, driveways, areas of hardstanding for car parking, access roads with ancillary areas of planted soft landscaping and areas of private domestic gardens.

This report should be reviewed once the development proposals have been finalised.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows.

- to determine the prevailing near surface ground conditions;
- to investigate and test for the presence of contamination;
- to investigate the extent of potentially geotechnically compromised ground associated with the identified risk of chalk dissolution;
- to carry out an appropriate risk assessment with regards to any contamination; and
- to provide advice and recommendations with respect to geotechnical design.

1.3 Scope of Work

In order to meet the above objectives, following on from the completion of the previously issued desk study report the ground investigation has been carried out in three phases and comprised, in summary, the following activities:

- a comprehensive geophysical investigation and assessment of the site by a specialist contractor;
- an initial phase of 90 dynamic probe holes located in areas identified as being of geotechnical concern and to provide an initial general coverage of the site;
- a second phase of physical investigation comprising 57 dynamic probes together with shallow window sampler boreholes to provide additional coverage of the site and plot specific probing in locations of potential concern;

- laboratory testing of selected soil samples for geotechnical properties;
- laboratory testing of selected soil samples for the presence of contamination;
- monitoring of the installed standpipes for groundwater levels and the presence of routine soil gasses; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by the Wilson Bailey Partnership.

The initial phase of ground investigation works were carried out during the winter months and the site remained in use as open grazing land for horses by the vendor and as such the method of ground investigation was limited to dynamic probing to mitigate disturbance to the ground.

2.0 THE SITE

2.1 Site Description

The site is an approximately rectangular shaped area of land with approximate maximum dimensions of 240 m by 120 m, the western boundary of which is formed by a line that segregates the site from further adjoining areas of open land used for grazing horses. The eastern boundary is variable but predominantly formed by the extent of fences and hedges that define the adjoining rear gardens to the various houses that front onto Lovedean Lane to the east. Within the northern part of the eastern site boundary there is a narrow access track that provides access to the site directly from Lovedean Lane, with an ongoing new residential development currently underway on adjoining land to the east of the site directly to the north of this access track.

The northern boundary to the site is formed by a mature hedge, beyond which is a recently completed residential development by Bargate Homes. The southern boundary to the site is formed by the houses and gardens to James Copse Road, with a small field gate also providing access from this road onto the site.

The site is located within the western side slope of a north to south trending dry valley within which Lovedean Lane is situated. The site has a variable topography and includes a number of areas of relatively steep slopes down towards the east, which are consistent with the local topography, but the site also slopes locally to the west, north and south. This variable topography is considered to be indicative of either natural ground variation as a result of chalk dissolution, man-made localised earthworks, or more likely a combination of both.

No indications of any distressed vegetation were noted and no indications of invasive plant species were identified during our site walkover, although it should be noted that our site visit was carried out during the winter, when evidence of invasive plant species and distressed vegetation can be seasonally absent.

There are also a series of above ground high voltage electricity cables supported on wooden poles that bisect the northern part of the site before dropping to ground level and passing below the site in ducts and then along through the central eastern part of the site and down the track to Lovedean Lane.

Beyond the site boundaries to the northwest and south west are areas of dense woodland that include a number of further variations in the topography with a series of dells and possible earthworks, although a full inspection of these off-site areas was not carried out.

2.2 Desk Study Findings Summary

Desk study research was carried out as part of the Desk Study Report presented separately.

The desk study indicated that the site is a predominantly greenfield site having not been developed previously other than the formation of what is recorded as being an old chalk pit within the central part of the site with a further old chalk pit located directly to the south of the site.

Historical mapping indicates that the field boundaries were significantly modified in the early 1940s, and that since the mid 1960s, the area surrounding the site to the east and south has become increasingly developed through the construction of predominantly new housing. The field to the north has also been developed more recently for housing by Bargate Homes Limited.

Anecdotal information suggests that the land may have been used by a turf company as a source of turf, which would have involved the removal of the upper layers of grass and topsoil for wholesale.

The environmental searches carried out as part of the desk study research have not indicated the presence of any particularly significant issues of concern with regard to land contamination, although these searches have indicated the site to be located within a Groundwater Source Protection Zone Class 1, which demonstrates a significant sensitivity.

The searches have also indicated the site to be located in an area where less than 1% of homes may be affected by radon emissions, which is the lowest risk category such that radon protection measures are not required as part of the redevelopment of this site.

The site is indicated to be underlain by junction between the clay and sand soils of the Lambeth Group overlying the chalk soils of the Tarrant Chalk, with a tract of alluvium to the west. This geological setting is a characteristic risk setting of chalk dissolution and the database searches have indicated numerous chalk dissolution features within the vicinity of the site and within the site itself.

2.3 Preliminary Risk Assessment

The long-term historical use of the site as open agricultural land remote from a farmyard centre is not considered to be significantly contaminative, such that there is considered to be a low risk of potentially significant ground contamination at this site.

The geological setting of the site is one that is particularly prone to chalk dissolution and publicly held records indicate the presence of a number of chalk dissolution features in the vicinity of the site. The walkover survey carried out as part of the desk study also identified the characteristic undulations of the topography across this site, which are likely to be indicative of historical chalk dissolution collapse feature

3.0 EXPLORATORY WORK SAMPLING STRATEGY

In order to meet the objectives described in Section 1.2 a multiphased ground investigation has been carried out at this site. The first phase of works comprised a comprehensive geophysical investigation and assessment of the site, using a range of techniques to identify an areas of anomalous ground conditions;

Based upon the findings of the geophysics survey, an initial phase of ground investigation comprising 90 dynamic probes was carried out in targeted locations to investigate the areas of anomalous ground conditions.

The second phase of physical ground investigation comprised a further 57 dynamic probes and window sampler boreholes was carried out in selected locations based upon the findings of the initial geophysics survey, the findings of the initial phase of works and the evolving development masterplan.

Representative samples of the soils encountered were taken to the laboratory for geotechnical testing and contamination analyses. The analytical suite of soil contamination testing was selected to identify concentrations of a wide range of potential contaminants of concern for the purposes of general coverage. For this investigation the analytical suite included a range of metals, speciated total petroleum hydrocarbons (TPHCWG), speciated polycyclic aromatic hydrocarbons (PAH), and monohydric phenols together with routine analyses for pH and organic content. The contamination analyses were carried out at a MCERTs accredited laboratory and details of the MCERTs accreditation and test methods may be supplied on request.

The borehole records and results of the insitu soil testing and laboratory analyses are appended together with a site plan indicating the exploratory positions.

4.0 GROUND CONDITIONS

The investigation has broadly confirmed the expected ground conditions in that below a relatively consistent coverage of topsoil, a minimal depth of superficial clay soils were found to overly chalk strata in the lower eastern part of the site, whilst a variable and generally significant depth of clay, silt and sand was encountered within the western part of the site

4.1 Topsoil

Across the site a generally nominal thickness of apparently natural topsoil was encountered to a depth of up to about 0.20 m below ground level and found to comprise a dark brown sandy clay with abundant roots and rootlets and occasional fine gravel.

No visual or olfactory indications of ground contamination were noted within the topsoil. Representative samples of the topsoil were recovered from a number of the boreholes from across the land parcels and analysed for a range of contaminants and the results are summarised in Section 4.5. Due to budgetary constraints it was not possible to analyse samples from every exploratory hole.

The apparently shallow depth of topsoil is perhaps consistent with the anecdotal references to the site having been used as a source of commercial turf, the cutting of which would have reduced the depth of topsoil remaining at this site.

It is important to note that no indications of man-made fill materials were identified in the location of the historical chalk pit identified on mapping records towards the centre of the site, indicating that this feature has not been infilled.

4.2 Head Deposits

Within the southeastern part of the site, at the topographically lowest area, the superficial topsoil layer has been found to be underlain by soft brown clay soils. These soils have been encountered to depths of up to 3.00 m and 8.00m within this part of the site, with the depth to the base of these soils rapidly reducing to zero as the ground level risings up from the southwestern corner of the site. The variation of the depth to the base of these clay soils is consistent with their disposition as a recent deposit within a valley infill. The variation of the depth to the base of these clay soils suggests that there is a variation in the erosional interface between the clay and the chalk, which could potentially include infilling of relic dissolution features

4.3 Lambeth Group Clay

Across the western part of the site variable depth and variable clay, silt and sand soils of the Lambeth Group were encountered to variable depths. These soils were found to be locally intermixed with weathered and completely weathered chalk strata as a result of chalk dissolution and weathering processes associated with the feather edge of these soils.

4.4 Tarrant Member of the Upper White Chalk

Within the central and northern parts of the site, directly underlying the superficial topsoil, variably weathered to moderately sound chalk was encountered and proved to the maximum depth of investigation in this part of the site

Evidence of chalk dissolution was noted and has been confirmed by both the geophysical investigations and the physical investigations of the site. Targeted investigations in the vicinity of features of concern have confirmed the presence of locally unstable ground at a range of depths. Site wide geophysical surveys comprising a combination of electro resistivity and gravitational anomaly surveys together with further targeted ground investigation have indicated the presence of variable ground conditions and variable water flow regimes associated with chalk dissolution.

4.5 Soil Contamination

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach. The use of a risk-based approach, which is presented in Part 2 of this report, means that it is not appropriate to determine the significance of contamination test results by simply comparing individual contaminant concentrations to a single "trigger" or "target" concentration.

A limited number of soil contamination tests have been carried out on soil samples recovered from the site, which have not indicated the presence of soil contaminants of concern and in particular they have not indicated the presence of ash related poly-aromatic hydrocarbons or total petroleum hydrocarbons

4.6 Groundwater

Groundwater was encountered within the eastern part of the site at the bottom of the valley at a depth of 6.80 m below ground level in this lowest part of the site.

4.7 Soil Gas

Precautionary monitoring for soil gasses has been carried out as part of this ground investigation although the desk study has not indicated the presence of any viable sources of on site or near site sources or any potentially mobile soil gasses. Elevated concentrations of potential soil gasses of concern have not been identified as part of the limited monitoring carried out to date.

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to foundation options and contamination issues.

5.0 INTRODUCTION

Consideration is being given to the development of the site through the construction a housing development that is anticipated to comprise traditional masonry built two storey housing together with areas of private gardens, communal access soft landscaping, access roads and areas of hard standing for car parking as part of the residential development of this brownfield site. Whilst development details have not been finalised, the advice presented within this report should be reviewed once the development proposals have been finalised.

6.0 GROUND MODEL

On the basis of the fieldwork, the ground conditions at this site can be characterised as follows.

- A generally nominal depth of topsoil was encountered to depths of less than about 0.30m, which is anecdotal references to the site having been used as a source of commercial turf, the cutting of which would have reduced the depth of topsoil remaining at this site.
- underlying the near surface topsoil across the upper western part of the site stiff clay soils of the Lambeth Group were encountered; whilst across the eastern lower part of the site soft clay Head Deposits were encountered;
- between the Lambeth Group and Head Deposits, within the middle part of the site heavily weathered chalk of the Upper White Chalk Group was encountered. Chalk was also encountered below the clay soils at a range of depths;
- this geological setting and its variation have been identified as being particularly prone to chalk dissolution, with evidence of long term and ongoing chalk dissolution identified as part of the ground investigation.
- no visual or olfactory evidence of ground contamination was noted within the near surface soils, with subsequent laboratory soil testing not indicating the presence of widespread elevated concentrations of a wide range of potential contaminants across the majority of the site;
- soil gas monitoring carried out has not indicated soil gas conditions of concern; and
- groundwater was only identified in a single borehole located within the lowest part of the site where groundwater was encountered at a depth of 6.80 m below ground level..

6.1 Contaminants of Concern

The results of comprehensive laboratory analyses carried out by an MCERTS accredited laboratory on a soil samples recovered from this site are enclosed. A total of 8 soil samples were submitted for routine contamination testing including testing for a wide range of metallic contaminants, speciated hydrocarbons, speciated poly-aromatic hydrocarbons and asbestos the

results of which are presented in Part 1 of this report. The acceptability criteria used as part of the assessment of these results are presented overleaf;

The significance of the measured concentrations of any chemicals of concern have been assessed in relation to the available Environment Agency provided statutory C4SLs, supplemented with the available S4UL values that have been adopted by the Chartered Institute of Environmental Health (CIEH) for a residential with plant uptake end use and a soil organic matter representative of the results of the testing carried out (1%). These values are widely accepted as providing a suitable initial screening value against which measured concentrations of potential contaminants can be assessed to determine the requirement for site specific quantitative risk assessment. With regards to lead, in the absence of robust current guidance to the contrary, we have adopted a conservative assessment criteria of 200mg/kg.

Determinant	Acceptability Criteria (residential with plant uptake) mg/kg	Number of exceedances	Location and value of exceedances
Asbestos	No asbestos	None	--
Arsenic (As)	32	None	--
Cadmium (Cd)	10	None	--
Chromium (hex)	4.3	None	--
Chromium (Cr)	3000	None	--
Copper (Cu)	2330	None	--
Lead (Pb)	200	None	--
Mercury (Hg)	1.0	None	--
Nickel (Ni)	130	None	--
Selenium (Se)	350	None	--
Zinc (Zn)	3750	None	--
Benzo(a)pyrene	5.0	None	--
Total Phenols (mono)	420	None	--
Aliphatic >C5 - C6	42	None	--
Aliphatic >C6 - C8	100	None	--
Aliphatic >C8 - C10	27	None	--
Aliphatic >C10 - C12	130	None	--
Aliphatic >C12 - C16	1100	None	--
Aliphatic >C16 - C21	65000	None	--
Aliphatic >C21 - C34	65000	None	--
Aromatic >C5 - C7	13	None	--
Aromatic >C7 - C8	22	None	--
Aromatic >C8 - C10	8.6	None	--
Aromatic >C10 - C12	13	None	--
Aromatic >C12 - C16	23	None	--
Aromatic >C16 - C21	46	None	--
Aromatic >C21 - C35	370	None	--

7.0 ADVICE AND RECOMMENDATIONS

7.1 Foundations

Whilst the ground conditions at this site present a localised risk of ground instability, the extensive probing works have identified areas where the risk is low, and development can proceed using a carefully considered foundation approach. The site investigation and probing works have also identified areas where the risk of present and future ground stability risk is high and these areas have been defined as no-build zones.

Within the lower risk areas, consideration has been given to the use of piled foundations, although the use of piling techniques are not consented at this site due to its location within a Zone 1 Groundwater Source Protection Zone and concerns associated with piling works affecting the groundwater chemistry and turbidity. Discussions have been held with the Regulatory Authorities to fully explore this option, which has been subsequently discounted from the foundation options available at this site.

Foundations to the proposed new buildings to be constructed at this site are to be designed on the basis of a reinforced raft foundation solution. Rafts are to be designed based on a uniformly distributed load of 50kPa and designed to be sufficiently reinforced to span over a potential void or soft spot developing to a diameter of 3.00m at any location beneath the raft. Whilst the extensive probing and ground investigation has not indicated the presence of substantial voids or soft spots within the areas where buildings are to be constructed, this precautionary approach is considered appropriate.

The above assumed net allowable bearing capacity value includes an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits. In the unlikely event that heavily or eccentrically loaded foundations are required, a check should however be made on the magnitude of settlement once the base sizes are known, as the design bearing pressure is settlement dependent.

Foundations will need to be deepened in the vicinity of existing, retained and proposed trees and National House Building Council (NHBC). Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted and due allowance should be made for future growth of trees. As part of the foundation assessment an allowance for the group effects of trees and dense vegetation should be considered, with further ground investigation and plot specific assessment carried out as deemed necessary by the structural engineers.

Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation. The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines. The results of laboratory geotechnical testing indicate the clay soils to be high plasticity with a high volume change potential.

All raft foundation formation levels will need to be inspected and proof rolled to check for the presence of soft spots. Any soft spots shall need to be inspected prior to being infilled with suitable granular material.

7.2 Earthworks

Due to the sloping nature of the site, parts of the development will be in areas of cut, whilst other parts of the site will be in areas of fill and areas of existing grade.

It is acknowledged that much of the cut material is not likely to be reusable due to a combination of chalk and soft clay, and as such the cut and fill assessment has a predominance of cut over fill. It is anticipated that there will be an opportunity for reuse and engineering placement of some site won clay soils, but that there is likely to also be a requirement for the importation and engineering placement of offsite sources suitable earthworks materials.

An earthworks testing regime will need to be agreed to confirm the suitability of any materials to be placed and a compaction testing regime to demonstrate adequate compaction and placement, particularly under proposed new buildings, roads and areas of hardstanding.

7.3 Excavations

It is likely that across the majority of the site shallow excavations for services and foundations within the near surface soils are likely to remain dry and broadly stable in the short term. Groundwater seepages of perched water may be encountered within the made ground although these should be of limited volume and should be readily controlled by sump pumping.

Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

Within the southeastern part of the development site, the design of the proposed development requires buildings to be formed with a partial basement level excavated into the locally steep slope. It is anticipated that with appropriate development planning and sequencing, it may be possible to form the excavations required for these units in open cut with appropriately battered slopes designed by a temporary works engineer. The structure may then be formed as a rigid concrete waterproofed box within the excavation.

The following parameters are suggested for the design of new retaining walls and are based upon an assessment of the material parameters

Stratum	Bulk Density (kg/m ³)	Effective Cohesion (c' – kN/m ²)	Effective Friction Angle (ϕ' – degrees)
Clay Head Deposits	1800	Zero	25
Lambeth Group Clay	1950	Zero	25
Weathered Chalk	1800	Zero	28

In accordance with the current design codes, basement retaining walls will need to be designed to withstand a water pressure unless an effective drainage system can be installed.

7.4 Pavement Design

CBR probing by TRRL DCP Probe has been carried out at 20m chainages along the proposed network of development roads in order to provide a profile of CBR values for road construction. Once detailed design levels are known, appropriate CBR values may be determined, although at

this stage it is considered that formation level for hard standings and access roads across the majority of the site is likely to be within the near surface clay soils such that pavements may be designed on the basis of an assumed California Bearing Ratio (CBR) of 2%.

Due to the presence of clay soils, earthworks and road formations within winter months may be challenging and the formation level may be expected to degrade rapidly with site traffic and rain.

Due to the risk of frost susceptibility within the chalk soils, where the road construction extends into areas underlain by chalk soils at road formation, a minimum 450mm road construction thickness will be required.

The design of the proposed new roads and areas of hardstanding should also incorporate a geotextile reinforcement intended to support the highway in the event of any chalk dissolution. This should be designed in order to prevent any catastrophic collapse, but also to undergo some deformation should chalk dissolution occur in order to highlight the requirement for investigation and assessment.

7.5 Buried Services

Precautions to ensure the protection of potentially sensitive underground services, such as drinking water pipes, are not likely to be required based on the results of parcel specific soil contamination testing.

Statutory utility providers do however have a responsibility for ensuring the provision of wholesome water and may insist upon a parcel wide requirement for protected plastic services, particularly due to the former military use and multiple phases of development and redevelopment at this site. Detailed discussions with the utility company should be held as soon as possible in order to discuss the protection of buried potentially sensitive services.

A precautionary design should also be carried out with regards to the potential impact of any ground instability upon buried services, with services excluded from areas of identified risk.

Appropriately robust materials selection and service jointing techniques should be incorporated into the civils design to mitigate the risk of any leakages that could cause a concentrated discharge of water and exacerbate any on site chalk dissolution.

7.6 Effect of Sulphates

The results of chemical analyses of selected soil samples for the presence of sulphates have however indicated generally low concentrations of soluble sulphate, corresponding to Class DS-1 AC-1s of Table 2 of BRE Special Digest 1: SD1 Part. The guidelines contained in the above digest should be followed in the design of foundation concrete.

7.7 Surface Water Drainage

Soakage testing did not form part of the brief for this ground investigation work as infiltration based drainage is not considered to present a viable option for the disposal of surface waters due to the identified risk and prevalence of chalk dissolution at this site.

Surface water is designed to be discharged via on-site lined attenuation to an adoptable system, thereby preventing the requirement for soakaways, with all areas of external hardstanding and roof water also diverted to this attenuated discharge system. Positive drainage is also to be provided to

all areas of patios and terraces, footpaths and bin stores.

Detailed consideration shall be given to the provision of cut off drainage to intercept near surface overland flow of surface waters onto the site from the adjoining land uphill to the west of the site. Further land drainage should be considered at the down slope side of the main no-build area in the southern part of the site

Careful consideration of the provision of surface water drainage during construction should be included within the construction management proposals for this site, which should include positive drainage to raft foundations pending construction of superstructures, together with positive drainage to construction compounds and materials storage areas to prevent percolation and manage surface waters.

The positive drainage and off site disposal of surface waters proposed as part of this development scheme will significantly reduce the volume of precipitation that enters the ground at this site, a consequence of which is that the geotechnical stability of the site will actually be improved by the development by reducing the potential for percolation related chalk dissolution.

7.8 Contamination Risk Assessment

The long-term historical use of the site as part of an area of open agricultural land remote from farm buildings would not be expected to present a significant concern with regards to soil contamination. The ground investigation has not identified widespread visual or olfactory indications of contamination. The results of soil contamination tests have also not indicated the presence of elevated concentrations of a wide range of potential soil contaminants across the site.

One of the requirements of the Environment Act (1995) is that local authorities carry out inspections of their area with a view to identifying sites that may be contaminated. When assessing whether a site is contaminated the local authority will attempt to establish the presence of a 'pollution linkage'. A pollution linkage requires there to be a source of contamination, a sensitive receptor that can be adversely affected by the contamination and a pathway via which contamination can reach the target.

The proposed development of the site will introduce new sensitive receptors in the form of end users and construction workers, together with the formation of new pathways through the creation of areas of private domestic gardens.

With regards to the specific considerations required under the planning conditions, the risk to the following potentially sensitive receptors has been considered;

Human Health (end users)

Potential risks posed to human health have been considered and the results of soil contamination testing indicate that across the majority of the site there is no requirement for ground remediation.

A requirement for soil gas protection to be incorporated into the design of ground floor slabs has not been identified. As with any development site there is an albeit limited potential for localised ground contamination that should be managed as part of an overall site contaminated land watching brief.

Human Health (site workers and future maintenance workers)

Precautions with regards to site workers and future maintenance workers and ground contamination are not envisaged.

Property (existing or proposed) including buildings, crops, livestock, pets, woodland and service lines and pipes,

The contaminated land risk to these potential receptors has been considered and in view of the absence of significant potentially mobile ground contamination, a significant risk warranting further action has not been identified.

Adjoining land,

The contaminated land risk to this potential receptor has been considered and in view of the absence of significant potentially mobile ground contamination, a significant risk warranting further action has not been identified.

Groundwater and surface waters

The existing contaminated risk to these potential receptors has been considered and in view of the absence of significant potentially mobile ground contamination, a significant risk warranting further action has not been identified.

The proposed development of this site, which is located in a particularly sensitive hydrogeological setting will present contaminated land risks during and after development through the introduction of a wide range of potentially mobile potential groundwater contaminants. The potential future sources of groundwater contamination include a wide range of fuels oils, grease and solvents that will be used as part of the construction, together with potential future contaminants associated with the domestic residential use of the site.

The design of the construction management procedures and the eventual surface water management scheme will need to take account of these potential risks and incorporate design features to mitigate the potential for contamination.

Ecological systems

The risk to this potential receptor has been considered and in view of the absence of significant potentially mobile ground contamination, a significant risk warranting further action has not been identified

7.9 Waste Disposal and Materials Management

Any spoil arising from excavations or landscaping works will need to be disposed of to a licensed tip. Under the European Waste Directive landfills are classified as accepting Inert, Non-hazardous or Hazardous wastes in accordance with Waste Acceptance Criteria (WAC) which, for Non-hazardous and Inert wastes are based upon the results of CEN method bulk leaching tests or percolation tests. Based upon the results of the analyses carried out and the technical guidance provided by the Environment Agency¹ it is considered likely that segregated natural arisings from construction works on this land parcel are likely to be generally classified as Inert providing there is a robust segregation of arisings. It is anticipated that a combined soil waste stream from this site without material segregation, is likely to result in arisings classified as Non-Hazardous.

In the unlikely event that during the ground works soils are found to be stained or have any hydrocarbon odour, they should be stockpiled separately from other soils in order that they may be tested to determine a revised waste classification, as these soils may potentially require classification as Hazardous waste. Any such segregation, stockpiling or on-site treatment to reduce or alter the likely waste classification will need to be carried out in accordance with a

¹ Environment Agency 2003. *Hazardous Waste: Interpretation of the definition and classification of hazardous waste*. Technical Guidance WM2

Materials Management Plan that will need to be approved by the Environment Agency prior to commencement of work. In any case, all waste classifications should be confirmed by the receiving landfill once the soils to be discarded have been identified. In order to finalise an Inert waste classification, it will probably be necessary to carry out further analyses including WAC CEN method bulk leaching tests. Such tests should be carried out upon representative samples from the waste stream once the extent of the materials to be discarded has been established.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material and the scope of any additional testing that may be required.

8.0 REQUIREMENT FOR CONTAMINATED LAND REMEDIATION

On the basis of the ground investigation works and subsequently soil gas and groundwater monitoring presented within this report the following requirement for remediation has been identified;

Requirement for Soil Contamination Remediation

The ground investigation works have not indicated the potential for on-site contamination of the soils, such that a requirement for soil remediation is not envisaged.

Requirement for Groundwater Remediation

The ground investigation works have not indicated the potential for on-site contamination of the groundwater, such that a requirement for groundwater remediation is not envisaged.

Requirement for Soil Gas Remediation

The desk study research and soil gas monitoring has not identified an increased risk with regards to soil gasses such that gas protection is not anticipated to be a requirement for the development at this site.

9.0 FURTHER WORK

A review of the recommendations provided as part of this report with regard to geotechnical design should be carried out once the design of the proposed scheme has been finalised. In particular, additional requirements for earthworks placement and testing may need to be considered, depending upon the finalised cut and fill proposals.

A detailed geotechnical watching brief will need to be maintained and be documented in order to confirm the inspections and proof rolling proposals are completed for each plot.

As with the development of any site there is a perhaps minimal risk of localised pockets of contamination being encountered as part of the proposed ground works. The development should therefore be carried out in accordance with the requirements of a routine geo-environmental watching brief, whereby should any contaminated or suspicious soils be encountered they may be appropriately tested, investigated and assessed by Wilson Bailey in consultation with the Regulatory Authorities before agreeing the scope of any remedial actions as necessary.

APPENDIX

Borehole Records

Probe Records

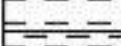
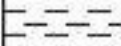
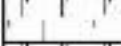
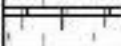
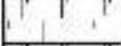
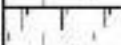
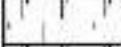
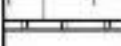
CBR TRRL Probe Records

Soil Geotechnical Laboratory Analyses

Soil Chemical Analyses

Gas and Groundwater Monitoring Records

Site Plan

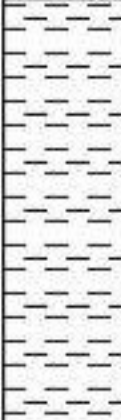
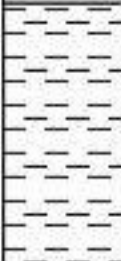
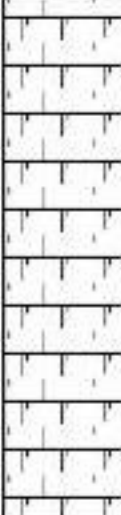
				Borehole Log			Borehole No. BH1 Sheet 1 of 1		
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468574E - 112543N		Hole Type WLS	
Location:						Level:		Scale 1:50	
Client: Bargate Homes						Dates: 30/10/2019		Logged By	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.25			TOPSOIL	
		0.50	D		0.45			Firm reddish brown slightly silty CLAY with occasional flint gravel and cobbles	0.5
		1.00	D		1.05			Firm pale orange-brown slightly silty CLAY with occasional locally abundant fine to medium weathered and unweathered chalk gravel	1.0
		1.00	SPT	N=5 (1,2/1,1,1,2)					
		1.50	D					Recovered as off white completely weathered CHALK with reddish brown soft clay veins and occasional flint cobbles (Grade Dc)	1.5
		2.00	D		2.30				2.0
		2.00	SPT	N=6 (2,2/2,1,2,1)					
		2.50	D					Recovered as intact CHALK with relic structure and occasional layers of more weathered chalk and reddish brown clay veining and fissures (Grade C4)	2.5
		3.00	D						3.0
		3.00	SPT	N=10 (1,2/3,3,2,2)					
		3.50	D						3.5
		4.00	D						4.0
		4.00	SPT	N=25 (6,5/5,6,7,7)					
					4.45			End of Borehole at 4.45m	4.5
Remarks Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.									

				Borehole Log			Borehole No. BH2 Sheet 1 of 1		
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468556E - 112478N		Hole Type WLS	
Location:						Level:		Scale 1:50	
Client: Bargate Homes						Dates: 30/10/2019		Logged By	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15		TOPSOIL		
		0.50	D				Soft becoming firm pale yellowish brown with pale grey, brown and red mottling CLAY with occasional partings of orange-brown silty sand	0.5	
		1.00	D		1.00			1.0	
		1.00	SPT	N=5 (1,0/1,2,1,1)	1.20		Recovered as off white completely weathered CHALK with no relic structure - recovered as silt (Grade Dm)		
		1.50	D				Pale brown silty clayey fine to medium chalk flint GRAVEL	1.5	
					1.60				
		2.00	D				Recovered as completely weathered white CHALK with no relic structure - recovered as gravel (Grade Dc)	2.0	
		2.00	SPT	N=11 (1,2/3,2,3,3)	2.25				
		2.50	D				Recovered as intact CHALK with relic structure - closely spaced fissures and layering with minimal clay infill and occasional flint gravel and cobbles (Grade C4)	2.5	
		3.00	D					3.0	
		3.00	SPT	N=25 (6,5/5,5,8,7)					
		3.50	D					3.5	
		4.00	D					4.0	
					4.45			4.5	
End of Borehole at 4.45m								4.5	
								5.0	
								5.5	
								6.0	
								6.5	
								7.0	
								7.5	
								8.0	
								8.5	
								9.0	
								9.5	
								10.0	

Remarks
 Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.



				Borehole Log			Borehole No. BH3 Sheet 1 of 1		
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468661E - 112487N		Hole Type WLS	
Location:						Level:		Scale 1:50	
Client: Bargate Homes						Dates: 30/10/2019		Logged By	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	D					MADE GROUND (reworked topsoil with occasional flint gravel and occasional chalk and occasional decayed organic matter)	0.5
		1.00	D		0.85			Firm brown and reddish brown locally silty sandy CLAY with occasional fine to medium flint and fine chalk gravel	1.0
		1.50	D						1.5
		2.00	D						2.0
		2.00	SPT	N=12 (2,3/2,3,3,4)					
		2.50	D						2.5
		3.00	D		3.00			Firm dark reddish brown locally silty CLAY with fine to medium coarse flint gravel	3.0
		3.50	D						3.5
		4.00	D						4.0
		4.50	D		4.30			Recovered as completely weathered CHALK comprising fine gravel size chalk fragments with a variety of off white commuted chalk matrix and occasional soft orange-brown clay matrix with occasional soft clay veins (Grade Dc & Grade Dm)	4.5
		5.00	D						5.0
		5.50	D						5.5
		6.00	D						6.0
		6.00	SPT	N=9 (3,1/0,1,1,7)					
		6.45	SPT	N=13 (4,4/3,3,3,4)					6.5
					6.90				7.0
								End of Borehole at 6.90m	7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0
Remarks Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.									

				Borehole Log			Borehole No. BH4 Sheet 1 of 1	
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468497E - 112557N		Hole Type WLS
Location:				Level:		Scale 1:50		
Client: Bargate Homes				Dates: 30/10/2019		Logged By		

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		TOPSOIL		
		0.50	D				Soft and very soft pale yellowish brown and pale grey mottled slightly silty CLAY	0.5	
		1.00	D					1.0	
		1.20							
		1.50	D				Firm pale grey and pale yellowish brown slightly silty CLAY	1.5	
		1.90							
		2.00	D				Pale greenish grey silty SAND	2.0	
		2.00					Stiff pale yellowish brown and pale grey and ref mottled CLAY		
		2.45	D					2.5	
		2.70							
		3.00	D				Stiff pale grey and pale yellowish brown and pale grey mottled silty sandy CLAY with abundant fine to medium flint gravel	3.0	
		3.00	SPT	50 (4,4/50 for 275mm)					
					3.20		Recovered as unweathered white CHALK - (Grade C4)	3.5	
					3.45		End of Borehole at 3.45m		
								4.0	
								4.5	
								5.0	
								5.5	
								6.0	
								6.5	
								7.0	
								7.5	
								8.0	
								8.5	
								9.0	
								9.5	
								10.0	

Remarks
 Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.



				Borehole Log			Borehole No. BH5 Sheet 1 of 1	
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468450E - 112627N		Hole Type WLS
Location:						Level:		Scale 1:50
Client: Bargate Homes						Dates: 30/10/2019		Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							TOPSOIL		
		0.50	D		0.35		Soft pale yellowish brown and brown silty CLAY with abundant fine to medium flint and fine to medium chalk gravel	0.5	
		1.00	D		1.00		Recovered as weathered white CHALK with pockets and veins of soft pale orange-brown silty clay and occasional flint gravel (Grade Dc & Grade Dm)	1.0	
		1.50	D					1.5	
		2.00	D					2.0	
		2.50	D					2.5	
		3.00	D		2.80		Recovered as white CHALK with relic structure (C4)	3.0	
		3.00	SPT	N=50 (9, 16/50 for 205mm)	3.45			3.5	
							End of Borehole at 3.45m	4.0	
								4.5	
								5.0	
								5.5	
								6.0	
								6.5	
								7.0	
								7.5	
								8.0	
								8.5	
								9.0	
								9.5	
								10.0	

Remarks
 Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.

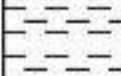
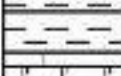
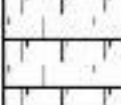
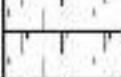
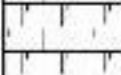
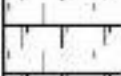
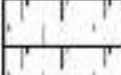
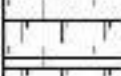
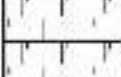
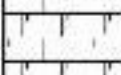
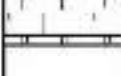


				Borehole Log			Borehole No. BH6 Sheet 1 of 1		
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468150E - 112639N		Hole Type WLS	
Location:						Level:		Scale 1:50	
Client: Bargate Homes						Dates: 30/10/2019		Logged By	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		TOPSOIL		
		0.50	D		0.45		Firm dark brown sandy CLAY with abundant fine chalk gravel	0.5	
		1.00	D				Recovered as completely weathered CHALK composed of white gravel size chalk fragments in a comminuted chalk matrix (Grade Dm)	1.0	
		1.00	SPT	N=17 (2,2/3,4,5,5)	1.20				
		1.50	D				Recovered as intact white CHALK without any clay infilled veins (Grade C4)	1.5	
		2.00	D					2.0	
		2.00	SPT	N=32 (7,5/3,4,9,16)					
					2.45		End of Borehole at 2.45m	2.5	
								3.0	
								3.5	
								4.0	
								4.5	
								5.0	
								5.5	
								6.0	
								6.5	
								7.0	
								7.5	
								8.0	
								8.5	
								9.0	
								9.5	
								10	

Remarks
 Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.



				Borehole Log			Borehole No. BH7 Sheet 1 of 1		
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468544E - 112688N		Hole Type WLS	
Location:						Level:		Scale 1:50	
Client: Bargate Homes						Dates: 30/10/2019		Logged By	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.35			TOPSOIL with abundant flint	
		0.50	D		0.80			Firm reddish pale orange-brown silty CLAY with flint cobbles and abundant fine chalk gravel	0.5
		1.00	D		1.00			Firm pale orange-brown silty CLAY with abundant fine to medium chalk gravel	1.0
		1.50	D					Recovered as completely weathered CHALK composed of fine to medium chalk gravel in a comminuted chalk matrix with occasional orange-brown staining (Grade Dm)	1.5
		2.00	D						2.0
		2.00	SPT	N=7 (1,2/2,1,2,2)					
		2.50	D						2.5
		3.00	D						3.0
		3.00	SPT	N=7 (2,3/2,2,1,2)					
		3.50	D		3.40			Recovered as white CHALK with relic structure (Grade C4)	3.5
		4.00	D						4.0
		4.00	SPT	N=15 (3,3/4,3,4,4)					
					4.45			End of Borehole at 4.45m	4.5
									5.0
									5.5
									6.0
									6.5
									7.0
									7.5
									8.0
									8.5
									9.0
									9.5
									10.0
Remarks Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.									

				Borehole Log			Borehole No. BH8 Sheet 1 of 1	
Project Name: Cottage Farm Site, Lovedean Phase II				Project No. J19024		Co-ords: 468601E - 112643N		Hole Type WLS
Location:						Level:		Scale 1:50
Client: Bargate Homes						Dates: 30/10/2019		Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30		TOPSOIL		
		0.50	D				Soft brown and pale brown CLAY with occasional fine to medium flint and chalk gravel	0.5	
		1.00	D					1.0	
		1.00	SPT	N=7 (1,2/2,1,2,2)	1.20				
		1.50	D				Soft pale orange-brown CLAY with abundant fine to medium chalk gravel and occasional flint cobbles	1.5	
		2.00	D					2.0	
		2.00	SPT	N=5 (1,1/1,1,2,1)	2.00		Recovered as completely weathered CHALK composed of fragments of chalk in a comminuted chalk matrix with occasional orange-brown staining (Grade Dm & Grade Dc)	2.5	
		2.50	D					2.5	
		3.00	D					3.0	
		3.00	SPT	N=7 (1,1/2,1,2,2)				3.5	
		3.50	D					4.0	
		4.00	D					4.5	
		4.00	SPT	N=6 (1,2/1,2,1,2)				5.0	
		4.50	D					5.5	
		5.00	D					6.0	
		5.00	SPT	N=9 (1,2/1,2,3,3)	5.45			6.5	
							End of Borehole at 5.45m	7.0	
								7.5	
								8.0	
								8.5	
								9.0	
								9.5	
								10	

Remarks
 Groundwater not encountered. Description of chalk fabric limited by drilling disturbance.





Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2				(1.60)	Firm pale yellowish brown, pale grey and reddish orange-brown mottled silty CLAY		
1.50	D3				1.80	Firm pale yellowish brown and pale grey and reddish orange-brown silty sandy CLAY		
2.00	D4				(1.20)			
2.50	D5				3.00	Complete at 3.00m		
3.00	D6							

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH100

Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend		Water
					(0.20) 0.20	TOPSOIL			
					(2.80)	Firm dark orange-brown silty sandy CLAY with scattered fine flint gravel			
					3.00	Complete at 3.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH. Poor recovery 2.00m to 3.00m.							Scale (approx) 1:50	Logged By	
							Figure No. J202009.BH101		

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH102		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				0.10	TOPSOIL			
					(0.60)	Soft pale yellowish brown silty CLAY			
1.00	D2				0.70	Firm pale reddish orange-brown silty CLAY with abundant fine to medium flint gravel and occasional flint cobbles			
1.50	D3				(0.40)				
2.00	D4				1.10	Stiff yellowish orange-brown and orange-brown silty slightly sandy CLAY with occaccional flint cobbles			
2.50	D5								
3.00	D6				(1.90)				
									
									
									
					3.00	Complete at 3.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH102	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH103		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.30) 0.30	TOPSOIL Firm brown silty CLAY with locally abundant fine to medium flint gravel			
1.00	D2				(2.00)				
1.50	D3								
2.00	D4								
2.50	D5				2.30 (0.70)	Recovered as off white and pale yellowish brown completely weathered CHALK with pale yellowish brown silty matrix (grade Dm)			
3.00	D6				3.00	Complete at 3.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH103	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH104		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.30) 0.30 (0.30) 0.60	TOPSOIL Firm brown sandy CLAY with abundant fine to medium chalk gravel Firm becoming stiff pale grey reddish orange-brown and yellowish brown mottled silty CLAY		          	
1.00	D2								
1.50	D3								
2.00	D4				(2.40)				
2.50	D5								
3.00	D6				3.00	Complete at 3.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH104	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH105		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 1.00 1.50 2.00	D1 D2 D3 D4				(0.30)	TOPSOIL			
					0.30	Firm pale yellowish reddish orange-brown silty locally sandy CLAY with occasional fine to medium flint and chalk gravel			
					(1.24)				
					1.54	Recovered as pale yellowish brown and off white completely weathered CHALK with abundant fine to medium flint gravel (grade Dm)			
					(0.46)				
					2.00	Complete at 2.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH105	

Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009		
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.50 1.00 1.50 2.00	D1				(0.20) 0.20	TOPSOIL Firm pale reddish orange-brown and yellowish brown silty sandy CLAY with abundant flint and chalk gravel				
	D2				(1.20)					
	D3				1.40 (0.60)	Recovered as completely weathered pale yellowish brown and off white CHALK with occasional flint gravel and cobbles (grade Dm)				
	D4				2.00	Complete at 2.00m				
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									Scale (approx) 1:50	Logged By
									Figure No. J202009.BH107	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH108		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				0.40	TOPSOIL			
1.00	D2				1.80	Firm reddish orange-brown silty slightly sandy CLAY with occasional flint cobbles and scatteded fine flint and chalk gravel			
1.50	D3				2.20	Recovered as completely weathered off white and pale brown CHALK with pale yellowish brown matrix (grade Dm)			
2.00	D4				3.00	Complete at 3.00m			
2.50	D5								
3.00	D6								
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH108			



Excavation Method Drive-In Windowless Sampler	Dimensions	Ground Level (mOD)	Client	Job Number J202009
	Location	Dates 01/09/2020	Engineer DPB	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2				(1.50)	Firm reddish orange-brown silty CLAY with scattered fine flint gravel		
1.50	D3				1.70	Firm reddish orange-brown silty CLAY with abundant flint gravel and cobbles		
2.00	D4				(1.30)			
2.50	D5				3.00	Complete at 3.00m		
3.00	D6							

Remarks Groundwater not encountered. DP to 10m adjacent to BH.	Scale (approx) 1:50	Logged By
	Figure No. J202009.BH109	



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2					Firm becoming stiff dark orange-brown silty locally sandy CLAY with occasional fine flint and chalk gravel and scattered flint cobbles		
1.50	D3				(2.80)			
2.00	D4							
2.50	D5							
3.00	D6				3.00	Complete at 3.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH110



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

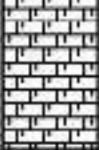
Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				0.10	TOPSOIL		
					(0.90)	Recovered as off white completely weathered CHALK with pale yellowish brown and brown matrix (grade Dm)		
1.00	D2				1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH111



Excavation Method
Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates
01/09/2020

Engineer
DPB

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10					0.10	TOPSOIL		
0.50	D1					Firm reddish orange-brown silty CLAY with abundant fine to medium flint gravel and occasional flint cobbles		
1.00	D2							
1.50	D3				(2.60)			
2.00	D4							
2.50	D5							
2.70 (0.30)					2.70 (0.30)	Recovered as completely weathered pale brown and off white CHALK (grade Dc)		
3.00	D6				3.00	Complete at 3.00m		

Remarks
Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)
1:50

Logged By

Figure No.
J202009.BH112



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
					(0.60)	Firm pale yellowish reddish orange-brown silty CLAY with scattered fine chalk gravel		
1.00	D2				0.80 (0.20) 1.00	Recovered as off white and pale brown completely weahered CHALK (grade Dm)		
						Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH113



Site

Lovedean Phase II

Number
BH115

Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

Water

0.50

D1

1.00

D2

1.50

D3

2.00

D4

(0.25)

0.25

TOSPOIL

Firm reddish orange-brown silty CLAY with abundant chalk gravel

(1.60)

(1.85)

(0.15)

2.00

Recovered as white and off white completely weathered CHALK (grade Dc)

Complete at 2.00m

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale
(approx)

1:50

Logged
By

Figure No.

J202009.BH115



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job
Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2				(1.10)	Firm reddish orange-brown silty CLAY with occasional locally abundant fine flint and chalk gravel		
1.50	D3				1.30 (0.70)	Recovered as off white completely weatehred CHALK with pale brown and off white silty matrix (grade Dm)		
2.00	D5				2.00	Complete at 2.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale
(approx)

1:50

Logged
By

Figure No.

J202009.BH116

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH117		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 1.00 1.50 2.00	D1				(0.30) 0.30	TOPSOIL			
					(1.20)	"Stiff" reddish orange-brown silty CLAY with occasional pale grey mottling - desiccated			
	D2				1.50	Recovered as completley weathered white CHALK with oale yellowish brown matrix (grade Dm)			
	D3				(0.50) 2.00	Complete at 2.00m			
	D4								
Remarks Groundwater not encountered. DP to 10m adjacent to BH.								Scale (approx) 1:50	Logged By Figure No. J202009.BH117

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH118			
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009		
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.50 1.00 1.50 2.00	D1				(0.25) 0.25	TOPSOIL				
					(0.95)	Firm pale yellowish brown silty slightly sandy CLAY				
	D2				1.20 (0.50)	Firm pale greenish grey and pale orange-brown silty sandy CLAY with abundant flint gravel and cobbles				
	D3				1.70 (0.30)	Recovered as off white and pale brown completely weathered CHALK (grade Dm)				
	D4				2.00	Complete at 2.00m				
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									Scale (approx) 1:50	Logged By Figure No. J202009.BH118

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH119	
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend
0.50	D1				(0.20) 0.20	TOPSOIL Firm pale yellowish brown and pale grey mottled silty CLAY		
1.00	D2				(1.60)			
1.50	D3							
2.00	D4				1.80 (0.20) 2.00	Recovered as white completely weathered CHALK (grade Dm) with pale brown veining		
						Complete at 2.00m		
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By
						Figure No. J202009.BH119		



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10					0.10	TOPSOIL		
0.50	D1					Firm orange-brown silty CLAY		
1.00	D2							
1.50	D3							
2.00	D4							
2.50	D5							
3.00	D6				(5.30)			
3.50	D7							
4.00	D8							
4.50	D9							
5.00	D10							
5.40	D11				5.40	Stiff reddish orange-brown and orange-brown silty CLAY with abundant fine to medium flint gravel and occasional flint cobbles		
6.00	D12							
6.50	D13							
7.00	D14							
7.50	D15				(4.60)			
8.00	D16							
8.50	D17							
9.00	D18							
9.50	D19							
10.00	D20				10.00			

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH121



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.30) 0.30	TOPSOIL		
1.00	D2					Firm reddish orange-brown and reddish brown slightly silty CLAY with occasional fine flint gravel		
1.50	D3							
2.00	D4							
2.50	D5				(5.00)			
3.00	D6							
3.50	D7							
4.00	D8							
4.50	D9							
5.00	D10							
5.50	D11				5.30 (0.70)	Recovered as white weathered CHALK (grade B3)		
6.00	D12				6.00	Complete at 6.00m		

Remarks

Groundwater not encountered, but chalk damp. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH122



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2					Firm pale brown, yellowish brown and pale grey mottled silty locally slightly sandy CLAY		
1.50	D3							
2.00	D4				(4.10)			
2.50	D5							
3.00	D6							
3.50	D7							
4.00	D8							
4.50	D9				4.30 (0.70)	Recovered as white weatehred CHALK (grade C4)		
5.00	D10				5.00	Complete at 5.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH123

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH124		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) 0.20 (0.90)	TOPSOIL Firm reddish orange-brown silty CLAY with abundant flint cobbles		    	
1.00	D2				1.10	Recovered as completely weathred pale yellowish brown and off white CHALK (grade Dm)		  	
1.50	D3				(0.90)				
2.00	D4				2.00	Complete at 2.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH. Poor recovery 0.5 to 1.00m due to flint cobble.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH124	



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
					(0.80)	Recoevred as white weatehred CHALK with abubndant flint gravel and ocacsional flint cobbles (grade C3)		
1.00	D2				1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

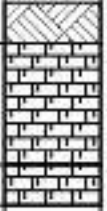
Logged By

Figure No.

J202009.BH125

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH126		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.50	D1				(0.20) 0.20 (0.60)	TOPSOIL Firm reddish orange-brown and pale yellowish brown silty CLAY with abundant fine to medium chalk gravel	  		
1.00	D2				0.80 (0.20) 1.00	Recoevered as completely weatehd pale yellowish brown and white CHALK (grade Dm) Complete at 1.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH126			

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH127		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) 0.20 (0.70) 0.90	TOPSOIL Firm brown silty CLAY with ocasional flint and chalk gravel		   	
1.00	D2				(0.70)	Recovered as white and off white completely weathered CHALK with pale brown matrix and veining (grade Dc)		  	
1.50	D3				1.60	Recovered as white weatehd CHALK (grade C4)		  	
2.00	D4				(0.40) 2.00	Complete at 2.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH127	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH128		
Excavation Method Drive-in Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) 0.20 (0.60)	TOPSOIL Recovered as white completley weatherd CHALK with occasional flint cobbles (grade Dc)			
1.00	D2				0.80 (0.20) 1.00	Recoverd as white weathred CHALK (grade C4)			
						Complete at 1.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH128			



Excavation Method
Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates
01/09/2020

Engineer
DPB

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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20 (0.15) 0.35	TOPSOIL Firm reddish orange-brown and pale yellowish brown silty CLAY with abundant fine to medium chalk gravel		
1.00	D2				(0.65) 1.00	Recovered as completely weathered pale yellowish brown and white CHALK (grade Dm)		
						Complete at 1.00m		

Remarks
Groundwater not encountered. DP to 10m adjacent to BH.

Scale
(approx)
1:50

Logged
By

Figure No.
J202009.BH129

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH130		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) 0.20 (0.40) 0.60 (0.40) 1.00	TOPSOIL Firm reddish orange-brown and pale yellowish brown silty CLAY with abundant fine to medium chalk gravel Recovered as completely weathered pale yellowish brown and white CHALK (grade Dm)			
1.00	D2					Complete at 1.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH130			



Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.70)	TOPSOIL and subsoil with occasional flint and pockets of brown shale - possibly reworked		
1.00	D2				0.70	Firm pale yellowish greenish brown silty locally sandy CLAY with occasional chalk gravel		
1.50	D3				(1.30)			
2.00	D4				2.00	Recovered as pale brown and white completely weatehred CHALK (grade Dm)		
2.50	D5				2.40	Recovered as white weathered CHALK (grade C4)		
3.00	D6				(0.60)			
					3.00	Complete at 3.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH132



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.50)	MADE GROUND (reworked topsoil with occasional gravel)		
0.50	D1				0.50 (0.20)	MADE GROUND (reworked brown clay with abundant chalk)		
0.75	D2				0.70 (0.25)	MADE GROUND (black ashy silty clay with abundant chalk and occasional fine flint gravel)		
1.00	D3				1.05	Firm dark reddish orange-brown silty sandy CLAY with abundant fine chalk and fine flint gravel		
1.50	D4				(0.95)	Recovered as white and locally pale yellowish brown and off white mottled weathered CHALK (grade C4)		
1.75	D5							
2.00	D6				2.00	Complete at 2.00m		

Remarks

Groundwater not encountered. DP next to BH to 12m.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH140



Site

Lovedean Phase II

Number
BH143

Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.60)	TOPSOIL with abundant fine below 0.40m		
1.00	D2				0.60 (0.40) 1.00	Recovered as white and pale yellowish brown completely weathred CHALK with abundant flint gravek abnd cobbles (Grade Dm)		
						Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale
(approx)

1:50

Logged
By

Figure No.

J202009.BH143

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH145		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.30) 0.30 (0.60)	TOPSOIL Firm brown silty sandy CLAY with abundant fine to medium flint and chalk gravel		  	
1.00	D2				0.90 1.00	Recovered as off white completely weathered CHALK (Grade Dm) Complete at 1.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.									
								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH145	



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.30) 0.30	TOPSOIL		
					(0.70)	Recovered as off white and white weatehred CHALK with occasional pcoets of pale yellowish brown clayey silt infill (Grade Dm)		
1.00	D2				1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 12m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH146



Site

Lovedean Phase II

Number
BH147

Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.25) 0.25	TOSPOIL		
					(0.75)	Recovered as white weathered CHALK (grade C4) with limited , brown clay infilled with veins and fissures		
1.00	D2				1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 12m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH147



Site

Lovedean Phase II

Number
BH149

Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.30) 0.30	TOSPOIL		
					(0.70)	Recovered as off white and white completely weathered CHALK (Grade Dm)		
1.00	D2				1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale
(approx)

1:50

Logged
By

Figure No.

J202009.BH149

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH150		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.15) 0.15	TOPSOIL			
					(0.85)	Recovered as white completely weathered CHALK (Grade Dm) with occasional flints			
1.00	D2				1.00	Complete at 1.00m			
Remarks						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH150			



Site

Lovedean Phase II

Number
BH152

Excavation Method

Drive-In Windowless Sampler

Dimensions

Ground Level (mOD)

Client

Job
Number
J202009

Location

Dates

01/09/2020

Engineer

DPB

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.30)	TOPSOIL		
					0.30	Firm reddish orange-brown and red mottled slightly silty CLAY with occasional rounded flint gravel		
					(0.30)			
					0.60	Recovered as white and off white with reddish orange-brown clay infilled fissured completed weathered CHALK (Grade Dm)		
1.00	D2				(0.40)			
					1.00	Complete at 1.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

Logged By

Figure No.

J202009.BH152

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH153		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) 0.20 (0.80)	TOPSOIL Recovered as white completely weathered CHALK with pale brown veining (Grade Dc)		 	
1.00	D2				1.00	Complete at 1.00m			
Remarks Groundwater not encountered. DP to 10m adjacent to BH.						Scale (approx) 1:50		Logged By	
						Figure No. J202009.BH153			



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
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Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.25) 0.25	TOPSOIL		
					(0.45) 0.70	Firm brown sandy CLAY with abundant flint gravel and fine chalk gravel		
1.00	D2					Recoevred as white and off white completely weaterhed CHALK (Grade Dm) with occasional flint cobbles		
1.50	D3				(2.30)			
2.00	D4							
2.50	D5							
3.00	D6				3.00	Complete at 3.00m		

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

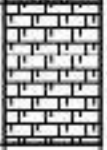
Logged By

Figure No.

J202009.BH154



Excavation Method Drive-In Windowless Sampler	Dimensions	Ground Level (mOD)	Client	Job Number J202009
	Location	Dates 01/09/2020	Engineer DPB	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.30) 0.30	MADE GROUND (reworked topsoil with fine brick fragments)		
					(0.70)	Recovered as white weathered CHALK (Grade C4)		
1.00	D2				1.00	Complete at 1.00m		

Remarks Groundwater not encountered. DP to 10m adjacent to BH.	Scale (approx)	Logged By
	1:50	
	Figure No. J202009.BH157	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH159		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.30)	TOPSOIL with abundant gravel			
					0.30	Firm dark reddish orange-brown silty sandy CLAY with abundant flint and chalk gravel and occasional flint cobbles			
					(0.60)				
1.00	D2				0.90	Recovered as completely weatehred off white CHALK (Grade Dc)			
					1.00	Complete at 1.00m			
									
Remarks Groundwater not encountered . Dp to 10m adjacent to BH.								Scale (approx) 1:50	Logged By
								Figure No. J202009.BH159	



Excavation Method

Drive-In Windowless Sampler

Dimensions

Location

Ground Level (mOD)

Dates

01/09/2020

Client

Engineer

DPB

Job Number
J202009

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				(0.20) 0.20	TOPSOIL		
1.00	D2				(1.60)	Firm reddish orange-brown and dark red brown silty sandy CLAY with abundant flint and chalk		
1.50	D3				1.80	Recovered as off white and white completely weathered CHALK (Grade Dc) with occasional flints		
2.00	D4				(1.20)			
2.50	D5				3.00	Complete at 3.00m		
3.00	D6							

Remarks

Groundwater not encountered. DP to 10m adjacent to BH.

Scale (approx)

1:50

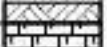
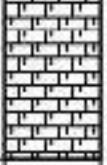
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Figure No.

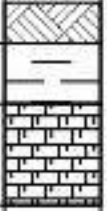
J202009.BH160



Excavation Method Drive-In Windowless Sampler	Dimensions	Ground Level (mOD)	Client	Job Number J202009
	Location	Dates 01/09/2020	Engineer DPB	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	D1				0.10	TOPSOIL		
					(0.90)	Recovered as white completely weatehred CHALK (Grade Dm)		
1.00	D2				1.00	Complete at 1.00m		

Remarks Groundwater not encountered. DP to 10m adjacent to BH.	Scale (approx)	Logged By
	1:50	
	Figure No. J202009.BH162	

 WILSON BAILEY GEOTECHNICAL & ENVIROMENTAL					Site Lovedean Phase II		Number BH165		
Excavation Method Drive-In Windowless Sampler		Dimensions		Ground Level (mOD)		Client		Job Number J202009	
		Location		Dates 01/09/2020		Engineer DPB		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	D1				(0.20) TOPSOIL 0.20 (0.30) Firm reddish orange-brown sandy slightly silty CLAY with occasional fine flint and chalk gravel 0.50 (0.50) Recovered as white and off white completeley weathered CHALK (Grade Dm) 1.00				
1.00	D2				Complete at 1.00m				
Remarks Groundwater not encountered. DO to 10m adjacent to BH.						Scale (approx)		Logged By	
						1:50			
						Figure No. J202009.BH165			

Phase 2 BCP results																																																																																																			
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36																																																																



Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No. 28944	Project Name Lovedean 2	Programme	
		Samples received	02/10/2020
		Schedule received	20/10/2020
Project No. -	Client Wilson Bailey	Project started	21/10/2020
		Testing Started	03/11/2020

Hole No.	Sample				Soil Description	NMC %	Passing 425µm %	LL %	PL %	PI %	Remarks
	Ref	Top m	Base m	Type							
BH102	-	1.50	-	D	Orangish brown mottled light grey slightly gravelly slightly sandy silty CLAY (gravel is fm and sub-angular)	22	95	44	19	25	
BH110	-	1.50	-	D	Orangish brown slightly gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular)	22	82	45	23	22	
BH117	-	1.00	-	D	Orangish brown mottled light bluish grey sandy silty CLAY with occasional roots, rootlets and rare fine gravel	12	99	36	16	20	
BH118	-	1.00	-	D	Orangish brown mottled bluish grey slightly sandy silty CLAY with occasional fine gravel	32	98	76	29	47	
BH122	1	1.00	-	D	Grey mottled reddish brown silty CLAY	24	100	67	23	44	
BH122	2	1.00	-	D	Orangish brown slightly gravelly slightly fine sandy silty CLAY (gravel is fm and sub-angular)	21	98	39	18	21	

 UKAS TESTING 2519	Test Methods: BS1377: Part 2: 1990; Natural Moisture Content : clause 3.2 Atterberg Limits: clause 4.3 and 5.0	Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com	Checked and Approved Initials J.P Date: 04/11/2020
	Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)		MSF-5-R1(b)

		Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12							
Job No. 28944		Project Name Lovedean 2						Programme Samples received 02/10/2020 Schedule received 20/10/2020 Project started 21/10/2020 Testing Started 29/10/2020	
Project No. -		Client Wilson Bailey							
Hole No.	Sample				Soil description	Dry Mass passing 2mm %	SO4 Content mg/l	pH	Remarks
	Ref	Top m	Base m	Type					
BH102	-	1.50	-	D	Orangish brown mottled light grey slightly gravelly slightly sandy silty CLAY (gravel is fm and sub-angular)	98	230	7.60	
BH110	-	1.50	-	D	Orangish brown slightly gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular)	98	170	7.55	
BH117	-	1.00	-	D	Orangish brown mottled light bluish grey sandy silty CLAY with occasional roots, rootlets and rare fine gravel	99	200	7.52	
BH118	-	1.00	-	D	Orangish brown mottled bluish grey slightly sandy silty CLAY with occasional fine gravel	99	220	7.52	
BH122	1	1.00	-	D	Grey mottled reddish brown silty CLAY	100	210	7.53	
BH122	2	1.00	-	D	Orangish brown slightly gravelly slightly fine sandy silty CLAY (gravel is fm and sub-angular)	98	250	7.52	
 Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com									Checked and Approved Initials J.P Date: 04/11/2020
2519		Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)						MSF-5-R29	



Dominic Brightman
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t: 01622 850410

DETS Report No: 20-10891

Site Reference: Lovedean Lane Phase 2

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 18/09/2020

Sample Scheduled Date: 21/09/2020

Report Issue Number: 1

Reporting Date: 30/09/2020

Authorised by:



Kevin Old
General Manager

Dates of laboratory activities for each tested analyte are available upon request.

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Soil Analysis Certificate						
DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH129	BH136	BH142	BH140	BH140
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.25 - 0.50	0.25	0.25	0.75	1.00
Reporting Date: 30/09/2020	DETS Sample No	499941	499942	499943	499944	499945

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.4	8.2	8.2	8.1	8.3
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1.2	1.4	2.1	7.3	0.7
Arsenic (As)	mg/kg	< 2	MCERTS	2	2	< 2	< 2	2
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1	1	1.5	1.7	1.1
Chromium (Cr)	mg/kg	< 2	MCERTS	30	29	23	20	26
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	16	17	21	33	12
Lead (Pb)	mg/kg	< 3	MCERTS	24	30	39	16	12
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	1.1
Nickel (Ni)	mg/kg	< 3	MCERTS	31	31	24	30	26
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	130	90	89	90	61
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH145	BH150	BH155		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	0.50	0.25	0.25		
Reporting Date: 30/09/2020	DETS Sample No	499946	499947	499948		

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		
pH	pH Units	N/a	MCERTS	8.3	8.4	8.3		
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	0.8	1.1	1.4		
Arsenic (As)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1	1.3	1.6		
Chromium (Cr)	mg/kg	< 2	MCERTS	24	24	24		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	11	17	21		
Lead (Pb)	mg/kg	< 3	MCERTS	15	20	27		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	27	25	29		
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3		
Zinc (Zn)	mg/kg	< 3	MCERTS	54	81	90		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion.
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH129	BH136	BH142	BH140	BH140
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.25 - 0.50	0.25	0.25	0.75	1.00
Reporting Date: 30/09/2020	DETS Sample No	499941	499942	499943	499944	499945

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH145	BH150	BH155		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	0.50	0.25	0.25		
Reporting Date: 30/09/2020	DETS Sample No	499946	499947	499948		

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH129	BH136	BH142	BH140	BH140
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.25 - 0.50	0.25	0.25	0.75	1.00
Reporting Date: 30/09/2020	DETS Sample No	499941	499942	499943	499944	499945

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH145	BH150	BH155		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	0.50	0.25	0.25		
Reporting Date: 30/09/2020	DETS Sample No	499946	499947	499948		

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH129	BH136	BH142	BH140	BH140
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	0.25 - 0.50	0.25	0.25	0.75	1.00
Reporting Date: 30/09/2020	DETS Sample No	499941	499942	499943	499944	499945

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 20-10891	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Lovedean Lane Phase 2	TP / BH No	BH145	BH150	BH155		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	0.50	0.25	0.25		
Reporting Date: 30/09/2020	DETS Sample No	499946	499947	499948		

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 20-10891

Wilson Bailey Geotechnical & Environmental Ltd

Site Reference: Lovedean Lane Phase 2

Project / Job Ref: None Supplied

Order No: None Supplied

Reporting Date: 30/09/2020

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 499941	BH129	None Supplied	0.25 - 0.50	12	Light brown sandy clay
^ 499942	BH136	None Supplied	0.25	10.7	Light brown sandy clay with stones and chalk
^ 499943	BH142	None Supplied	0.25	10.5	Brown sandy clay with vegetation and chalk
^ 499944	BH140	None Supplied	0.75	12.8	Black sandy clay with chalk
^ 499945	BH140	None Supplied	1.00	11.5	Light brown sandy clay with stones and chalk
^ 499946	BH145	None Supplied	0.50	11.3	Light brown sandy clay with stones and chalk
^ 499947	BH150	None Supplied	0.25	7.1	Brown sandy clay with stones and chalk
^ 499948	BH155	None Supplied	0.25	7	Brown sandy clay with stones and chalk

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{IS}

Unsuitable Sample ^{US}

^ no sampling date provided; unable to confirm if samples are within acceptable holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-10891

Wilson Bailey Geotechnical & Environmental Ltd

Site Reference: Lovedean Lane Phase 2

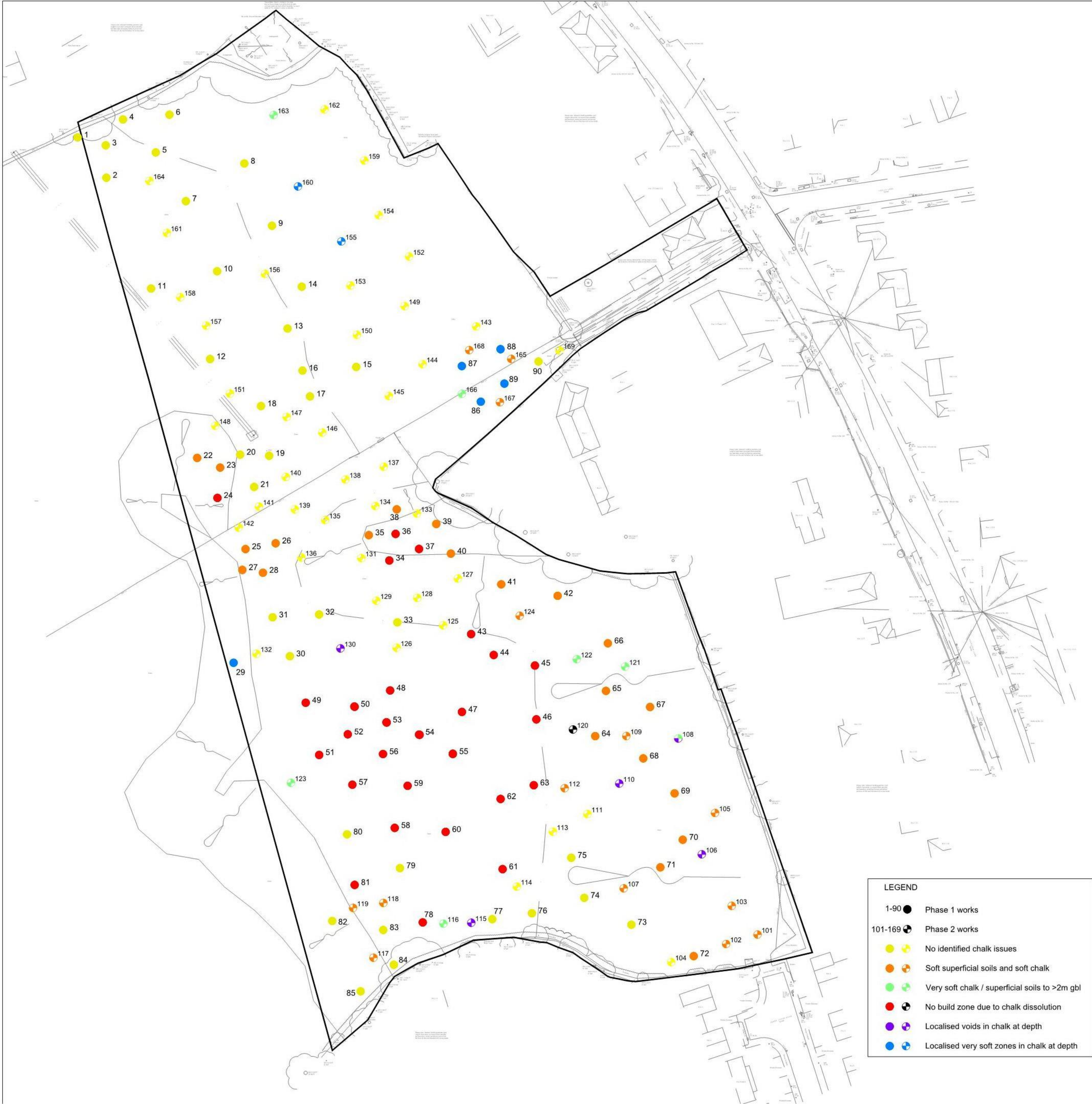
Project / Job Ref: None Supplied

Order No: None Supplied

Reporting Date: 30/09/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphencylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (all: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (all: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



LEGEND

- 1-90 ● Phase 1 works
- 101-169 ● Phase 2 works
- No identified chalk issues
- Soft superficial soils and soft chalk
- Very soft chalk / superficial soils to >2m gbl
- No build zone due to chalk dissolution
- Localised voids in chalk at depth
- Localised very soft zones in chalk at depth

PHASE 2 LOCATIONS			
	EASTINGS	NORTHINGS	LEVELS
101	468664.19	112482.09	58.54
102	468656.07	112479.65	59.13
103	468657.52	112489.50	59.01
104	468641.88	112474.97	60.58
105	468653.22	112513.50	59.18
106	468649.79	112502.82	59.55
107	468629.60	112494.04	61.72
108	468643.71	112532.75	59.74
109	468630.30	112533.39	61.12
110	468628.47	112521.10	61.53
111	468620.25	112513.21	62.50
112	468614.34	112519.91	62.93
113	468611.31	112508.66	63.31
114	468601.98	112494.50	64.07
115	468590.22	112485.14	64.79
116	468583.02	112484.90	65.23
117	468564.95	112476.11	66.51
118	468567.51	112490.26	66.02
119	468559.67	112488.98	66.48
120	468616.49	112535.06	62.57
121	468629.99	112551.31	60.75
122	468617.49	112553.24	62.01
123	468543.62	112521.29	65.98
124	468602.73	112564.45	62.76
125	468582.95	112561.98	63.86
126	468570.93	112556.18	64.68
127	468586.74	112574.07	63.07
128	468576.26	112569.07	63.85
129	468565.69	112568.35	64.36
130	468556.41	112556.01	65.52
131	468561.81	112579.33	63.95
132	468534.72	112554.64	66.35
133	468576.17	112590.86	63.02
134	468565.44	112592.79	63.95
135	468552.46	112589.17	64.78
136	468546.33	112579.49	65.29
137	468567.62	112602.95	63.82
138	468557.70	112599.64	64.53
139	468544.63	112591.91	65.48
140	468542.29	112600.29	65.62
141	468535.36	112592.63	66.08
142	468530.11	112587.23	66.26
143	468591.50	112639.19	60.71
144	468577.63	112629.44	62.18
145	468568.91	112621.22	63.32
146	468551.73	112611.77	64.95
147	468542.53	112615.80	65.55
148	468524.06	112613.54	66.90
149	468573.03	112644.43	62.28
150	468560.69	112637.02	63.94
151	468527.85	112621.84	66.88
152	468574.16	112657.26	61.57
153	468558.99	112649.76	63.78
154	468566.33	112667.92	61.75
155	468556.65	112661.15	63.42
156	468536.89	112652.77	66.04
157	468521.72	112639.39	67.25
158	468515.03	112646.72	67.67
159	468562.61	112682.04	61.41
160	468545.43	112675.35	64.24
161	468511.56	112663.34	67.78
162	468552.29	112695.26	61.91
163	468539.14	112693.81	63.81
164	468507.04	112676.80	67.98
165	468600.55	112630.81	60.39
166	468587.80	112621.79	61.73
167	468597.62	112619.60	61.20
168	468589.71	112633.06	61.02
168	468613	112633	59.90

- GENERAL NOTES:**
1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.



A	02.11.20	PJR	Phase 1 works& references added. Key added.	MK
REV	DATE	BY	DESCRIPTION	CHK

Issue Status **FOR INFORMATION**

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CLIENT Bargate Homes	
PROJECT Norton Heights Phase 2 Lovedean Lane, Hordean	
TITLE Site Layout - Site Investigation Setting Out Phase 1 and Phase 2 Works	
DRAWN A Davies	DATE Sept 2020
ENGINEER S Magowan	CHECKED
SCALE 1:500 @ A1, 1:1000 @ A3	PROJECT NO. 23246
	REV 12 A