



Himley Village, Bicester

Ground Investigation Report

Countryside Properties PLC

Date: 27 January 2021

Doc ref: 16153-HYD-XX-XX-GE-RP-1002-P1-S2

DOCUMENT CONTROL SHEET

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Client	Countryside Properties PLC	
Project name	Himley Village, Bicester	
Title	Ground Investigation Report	
BIM reference	16153-HYD-XX-XX-GE-RP-1002-P1-S2	
Project reference	C-16153	
Date	27/01/2021	

Document Production Record		
Status and Revision	S2 P1	Name
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Document Revision Record			
Status	Revision	Date	Revision Details
S2	P1	27/01/21	Initial Issue

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CONTENTS

1.	INTRODUCTION.....	1
2.	SITE OVERVIEW	4
3.	OUTLINE CONCEPTUAL MODEL	6
4.	GROUND INVESTIGATIONS	10
5.	GROUND INVESTIGATION RECORDS AND DATA	13
6.	GEOTECHNICAL ASSESSMENT.....	23
7.	GEO-ENVIRONMENTAL ASSESSMENT.....	32
8.	WASTE AND MATERIALS MANAGEMENT.....	39
9.	UNCERTAINTIES AND LIMITATIONS	45
10.	RECOMMENDATIONS FOR FURTHER WORK.....	47
11.	REFERENCES.....	48

Appendices

Appendix A	Drawings
Appendix B	Field Reconnaissance Photographs
Appendix C	Exploratory Hole Location Plan, Exploratory Hole Logs and Photographs
Appendix D	Geotechnical Test Results and Geotechnical Plots
Appendix E	Site Monitoring Data and Ground Gas Risk Assessment
Appendix F	Contamination Test Results and Statistical Analysis
Appendix G	Waste Assessment
Appendix H	Preliminary Geotechnical Risk Register
Appendix I	Plausible Source-Pathway-Receptor Contaminant Linkages
Appendix J	Hydrock Methodologies

Tables

Table 2.1: Site referencing information	4
Table 2.2: Site description.....	4
Table 4.1: Investigation rationale.....	10
Table 4.2: Summary of site works	10
Table 4.3: Summary of monitoring installations	11
Table 4.4: Geo-environmental analyses of soils.....	12
Table 4.5: Summary of sample numbers for geotechnical tests	12
Table 5.1: Strata encountered	13
Table 5.2: Groundwater occurrence	15
Table 5.3: Groundwater level data summary.....	16

Table 5.4: Infiltration test results	17
Table 5.5: Range of ground gas data.....	17
Table 5.6: Volume change potential	18
Table 5.7: PSD results summary.....	18
Table 5.8: Soil strength results and derived values.....	19
Table 5.9: Summary of compressibility	20
Table 5.10: Compaction study results.....	20
Table 5.11: CBR results and derived values.....	21
Table 5.12: Aggressive chemical environment concrete classification	21
Table 6.1: Geotechnical parameters recommended for design of Geotechnical Category 1 Structures (EC7).....	24
Table 6.2: Preliminary earthworks assessment.....	26
Table 7.1: Ground gas risk assessment	36
Table 7.2: Residual risks following risk evaluation	38

Figures

Figure 2.1: Site location (Reproduced with permission from Groundsure)	4
Figure 2.2: Extract from the Ordnance Survey Map. (OS licence 100035207).....	4

EXECUTIVE SUMMARY

<i>SITE INFORMATION AND SETTING</i>	
Objectives	The works have been commissioned to support the planning application, as part of the due diligence process and to assist with the design of the development.
Client	Countryside Properties PLC
Site name and location	Himley Village, Bicester. Located north of the B4030, to the west of Bicester. The nearest postcode is OX26 1RT.
Proposed development	The site development proposals are understood to comprise residential dwellings with associated gardens, open space and infrastructure.
<i>GROUND MODEL</i>	
Desk study summary	<p>The site currently comprises two adjacent arable fields, with a farm track running north to south through the eastern end of the western field. The farm track was noted to have a surface of crushed aggregate. The possibility that this contains crushed concrete and other demolition materials including asbestos containing materials (ACM) cannot be ruled out. There are trees and hedges forming site and field boundaries, with grass and sporadic vegetation across the site. The site is approximately 28.5 ha in area and slopes down from the north-west to the south-east from approximately 95m to 84m above Ordnance Datum (m OD).</p> <p>Review of historical Ordnance Survey mapping indicates very little change in land use from 1876 (the date of earliest mapping) to the present day, with only footpaths and field boundaries changing. The surrounding area has also remained largely unchanged with the exception of land to the north-east where a lime kiln, quarry and railway appear in 1919 around 1km from the site.</p> <p>By 1981, there were residential properties approximately 500m to the east, with commercial warehouses constructed in 2019/2020 immediately east of the site.</p> <p>A non-specialist UXO assessment indicates a low bomb risk.</p> <p>The geology at the site is recorded by the BGS as Cornbrash Formation (limestone) overlying the Forest Marble Formation (limestone / mudstone). There are no superficial deposits recorded. However, a previous investigation recorded Superficial/Head Deposits across the wider area, typically to between 0.90m and 1.80m below ground level (bgl).</p> <p>The Cornbrash Formation and the Forest Marble Formation are both Secondary A aquifers. The site is not within a Source Protection Zone and there are no groundwater abstractions within 500m.</p> <p>A number of springs are marked in the surrounding area possibly suggesting shallow groundwater.</p> <p>There is a pond on the eastern boundary of the site, and the Gagle Brook flows from north-west to south-east approximately 400m south of it.</p> <p>The previous report indicates possible naturally occurring arsenic in the area.</p> <p>The site development proposals are understood to comprise residential dwellings with associated gardens, open space and infrastructure.</p>
Ground and groundwater conditions encountered by investigation	<p>The ground conditions as proven by the previous investigation comprise:</p> <ul style="list-style-type: none"> • Topsoil between ground level to 0.10m to 0.50m below ground level (bgl) comprising soft to stiff dark brown and reddish brown variably sandy gravelly clay and stiff light yellowish brown organic slightly sandy slightly gravelly clay; • Made Ground in R05 only, adjacent to the farm track, to between 0.20mbgl and 0.30mbgl, comprising concrete fragments; • Materials identified as Head Deposits from 0.10mbgl to 0.35mbgl, to depths of between 0.35mbgl and 2.00mbgl, comprising soft to firm orangish brown, reddish brown variably sandy gravelly clay with a medium cobble and boulder content; orangish brown, reddish

	<p>brown variably sandy clayey gravel locally with a medium to high cobble and boulder content;</p> <ul style="list-style-type: none"> • Cornbrash Formation from 0.15mbgl to 1.80mbgl to depths of between 1.00mbgl and 4.50mbgl, comprising alternating bands of firm to stiff orangish brown, grey and reddish brown variably sandy gravelly clay and bands of very weak to medium strong orangish brown and greyish brown limestone; • Forest Marble Formation from 1.00mbgl to 4.50mbgl comprising firm to very stiff grey brown, orangish brown, greenish grey and dark variably sandy gravelly clay. The bedrock deposits were weak to medium strong grey, orangish brown limestone and weak greenish grey mudstone. <p>Groundwater was encountered at depths between 0.60m bgl and 1.80m bgl.</p> <p>Groundwater levels recorded post-fieldwork ranged from 0.34m bgl to 1.32m bgl (85.51m OD to 93.98m OD).</p> <p>There is shallow, possibly perched, groundwater in the Head Deposits and Cornbrash Formation with variations locally due to the alternating bands of clay and limestone.</p> <p>There was also groundwater in the Forest Marble Formation which sub-crops at shallow depths in the south-east of the site.</p>
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GEOTECHNICAL CONCLUSIONS

Conclusions of geotechnical assessment	<p>Excavation to proposed founding depth generally should generally be feasible using standard excavation plant. Heavy duty excavation plant/breaking equipment may be required to excavate obstructions formed by the limestone of the Cornbrash and Forest Marble Formations.</p> <p>Excavations during investigation were generally stable. However, the Cornbrash Formation and the Forest Marble Formation can be fractured in the limestone beds and fissured in the clay beds and whilst instability due to fissuring or fracturing was not noted in the short trial pit excavations, this can cause instability in longer term excavations.</p> <p>Water seepages into excavations are unlikely to be adequately controlled by sump pumping alternative methods of dewatering are likely to be required.</p> <p>Foundations are recommended to comprise:</p> <ul style="list-style-type: none"> • Strip/trench fill foundations across the majority of the site, with deepening due to trees as required to a maximum depth of 2.5m bgl; • Piled foundations where foundations need to be deepened to depths in excess of 2.5m bgl. <p>Permissible net bearing pressure of 125kN/m² should be available for strip/trench fill foundations.</p> <p>Deepening of foundations/heave protection is likely to be required to allow for the effects of trees.</p> <p>Suspended floor slabs because of presence of medium shrinkage potential clay soils.</p> <p>Suspended over a void where within the influencing distance of trees.</p> <p>A design CBR of 2.5% is recommended.</p> <p>Soakaway drainage is considered unsuitable for this site.</p> <p>Design Sulfate Class - DS-4 and ACEC Class AC-4 for the shallow soils and for trench fill/strip foundations. Equivalent to Design Chemical Class DC-4 for a 50 year design life.</p> <p>Design Sulfate Class - DS-3 and ACEC Class AC-3 for piles. Equivalent to Design Chemical Class DC-3 for a 50 year design life.</p>
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GEO-ENVIRONMENTAL CONCLUSIONS

Conclusions of contamination Generic risk assessment	<p>Potential Human health risks requiring further consideration:</p> <ul style="list-style-type: none"> • Pesticides were detected in TP64 in the Topsoil. • Potential for ACM in, or beneath, the farm track. <p>Plant growth: No exceedances of GACs recorded and further consideration is not required.</p> <p>Controlled Waters: Site is not considered a risk to Controlled Waters and further consideration is not required.</p>
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	<p>Radon:</p> <ul style="list-style-type: none"> • The site is not in a Radon Affected Area. <p>Ground gases or vapours:</p> <ul style="list-style-type: none"> • Low risk from ground gases (subject to additional and on-going monitoring) and CS1 or Green conditions apply – no mitigation against ground gases required. <p>Water supply pipes:</p> <ul style="list-style-type: none"> • Standard pipework is considered suitable subject to confirmation should from the water supply company.
Proposed mitigation measures	<p>Additional sampling and testing of the Topsoil at TP64 to:</p> <ul style="list-style-type: none"> • Confirm the presence of pesticide (or absence following degradation); • Delineate the extents of pesticides around TP64; and • Assist in identifying any remedial works if required against pesticides. <p>Remedial measures, if required, are to be confirmed following this additional testing. Subject to this, and confirmation by a soil scientist, the topsoil is considered suitable for re-use.</p>
Waste management	<p>Excavated soils to be disposed of as waste, are likely to be classed as:</p> <ul style="list-style-type: none"> • Hazardous waste for the Topsoil due to a high organic content; and • Inert waste for the natural uncontaminated subsoils.
<i>FUTURE CONSIDERATIONS</i>	
Further work	<p>Following the ground investigation works undertaken to date, the following further works will be required:</p> <ul style="list-style-type: none"> • completion and reporting of the ongoing gas monitoring, hence the conclusions in this report are provisional, subject to the completion of monitoring; • supplementary sampling and laboratory testing to confirm the presence of pesticides in the topsoil at and around TP64 and, if required, delineate their vertical and horizontal extents. • Supplementary investigation, sampling and testing of the materials in the farm track for the potential presence of ACM. • assessment of tree influence on foundations and design of foundations, for which an updated arboricultural tree survey will be required; and • production of a Materials Management Plan relating to reuse of soils, disposal of excess soils (if required) and import of soils to the site.

This Executive Summary forms part of Hydrock Consultants Limited report number 16153-HYD-XX-XX-GE-RP-1002-P1-S2 and should not be used as a separate document.

1. INTRODUCTION

1.1 Terms of reference

In November 2020, Hydrock Consultants Limited (Hydrock) was commissioned by Countryside Properties PLC (the Client) to undertake a ground investigation at Himley Village, off the B4030 to the west of Bicester, Oxfordshire.

The site is currently agricultural fields.

Hydrock understands that the proposed development is to comprise approximately 500 residential dwellings with associated gardens, open space and infrastructure. A proposed development layout (Countryside Properties PLC Drawing HV-01-SK08), is presented in Appendix A.

The works have been undertaken in accordance with Hydrock's proposal referenced (C16153-HYD-XX-XX-FP-GE-0005, 28th October 2020) and the Client's instructions to proceed (email dated 28 October 2020).

Hydrock has previously provided a Desk Study Report for the site (Report reference 16153-HYD-XX-XX-GE-DS-1001-S2-P01 dated 9th December 2020) which should be read in conjunction with this ground investigation report.

1.2 Objectives

The works have been commissioned to support the planning application as part of the due diligence process and to assist with the design of the development.

The objective of the Phase 2 Ground Investigation is:

- to resolve uncertainties identified in the Phase 1 Desk Study by refining and updating the preliminary Ground Model, determining geo-environmental and geotechnical site conditions and identifying key contamination risks by updating and finalising the Conceptual Model in accordance with the principles of LCRM;
- to identify geo-environmental mitigation requirements to enable development; and
- to provide preliminary geotechnical recommendations for design.

1.3 Scope

The site investigation includes a Phase 2 Ground Investigation.

The scope of the Phase 2 Ground Investigation comprises:

- a ground investigation including trial pitting and rotary drilling to:
 - obtain data on the ground and groundwater conditions of the site;
 - allow collection of samples for geotechnical and chemical laboratory analysis;
 - allow geotechnical field tests to be undertaken;
 - install gas and groundwater wells;
- gas concentration and groundwater level monitoring;
- geotechnical and chemical laboratory analysis;
- updating of the preliminary Ground Model;

- preparation of a geotechnical risk register;
- presentation of an initial geotechnical design recommendations;
- formulation of an updated Conceptual Model (CM), including identification of plausible pollution linkages;
- completion of a generic quantitative risk assessment of potential chemical contaminants to establish 'suitability for use' under the current planning regime;
- discussion of potential environmental liabilities associated with land contamination (soil, water and gas); and
- identification of outline mitigation requirements to ensure the site is 'suitable for use'.

1.4 Available information

The following reports and other documents have been provided to Hydrock by Countryside Properties PLC for use in the preparation of this report:

- Hyder. February 2011. 'NW Bicester Eco Development Geotechnical Interpretative Report - Masterplan Site'. Ref: 2507-UA001881-UP33R-01 (for A2 Dominium and P3Eco Ltd.)
- Penoyre & Prasad. 6th March 2020. '592-Himley Village. Land Transfer Plan 02. Ref 592-SK-072 Rev A.
- Alan Baxter. December 2014. 'Himley Village Development Surface Water Drainage Strategy and Flood Risk Assessment'. Unreferenced.
- Waterman. January 2015. 'Himley Village Outline Application Tree Survey Report'. Ref: EED14995-100-R-7-1-3-TA (for P3Eco).

It is understood that the Client has commissioned or obtained assignment of the above documents and Hydrock and Hydrock is entitled to full reliance upon their contents.

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015+A1:2020, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+A2:2017, 'Land Contamination: Risk Management' (LCRM, 2020) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with the potential geo-environmental risk assessed qualitatively using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990). Potential geotechnical risks are also assessed.

Phase 2 comprises intrusive ground investigation work and testing. The factual information from Phase 1 and Phase 2 are used to develop the Conceptual Model (CM). This CM is based on a ground model of the site physical conditions and an exposure model of the possible contaminant linkages. The CM forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines. This GQRA might lead to more Detailed Quantitative Risk Assessment (DQRA).

Professional judgement is then used to evaluate the findings of the risk assessments and to provide recommendations for the development.

The geotechnical section of this report is prepared in general accordance with BS EN 1997-1+A1: 2013, BS EN 1997-2:2007 and BS 8004:2015. This report constitutes a Ground Investigation Report (GIR) as described in Part 2 of Eurocode 7 (BS EN 1997-2) (EC7). However, it is not intended to fulfil the requirements of a Geotechnical Design Report (GDR) as specified in EC7.

Where relevant the NHBC Standards (2021), have also been applied.

The geo-environmental and geotechnical aspects are discussed in separate sections. Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and the term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. Designers should take all aspects of the investigation into account.

Remaining uncertainties and recommendations for further work are listed in Section 0 and Section 10.

Reference to the details of the approach and the methodologies adopted are provided in Appendix J.

2. SITE OVERVIEW

2.1 Site referencing

The site is referenced in Table 2.1 and the location is indicated in Figure 2.1 and Figure 2.2.

Table 2.1: Site referencing information

Item	Brief Description
Site name	Himley Village, Bicester
Site address	To the north of the B4030, west of Bicester, Oxfordshire. The nearest postcode is OX26 1RT.
Site location and grid reference	The site is located off the B4030 approximately 500m east of the M40 and 50m west of the A4095 Howes Lane, Bicester Western Bypass. The site is approximately 2km west of Bicester town centre. The National Grid Reference of the approximate centre of the site is 455855E, 223172N.



Figure 2.1: Site location (Reproduced with permission from Groundsure)



Figure 2.2: Extract from the Ordnance Survey Map. (OS licence 100035207).

A site location plan (Hydrock Drawing 16153-HYD-XX-ZZ-DR-GE-1000) is presented in Appendix A.

2.2 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 3rd November 2020 to visually assess potential geotechnical hazards, contaminant sources and receptors. The weather during the field reconnaissance survey was dry.

A site description is presented in Table 2.2. Additional photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site area	The site is irregular in shape and has an area of approximately 28.5 ha.
Site access	The site comprises two fields. The western field is accessed from the B4030 through a gated track that trends north to south across the eastern section of this field to Himley Farm. The eastern field is accessed via a gap in the hedgerow from the B4030 onto the field.
Elevation, topography and	The site is mostly flat, gently sloping from 95m OD in the north-west corner to 84m OD in the south-east. At an average gradient of approximately 0.01.

Item	Brief Description
any geomorphic features	
Present land use	The current land use is arable farmland, with a track running from north to south across the eastern end of the westernmost field. An overhead electricity cable runs across the north-east corner from north-west to south-east. There are two further overhead cables (thought to be telephone cables) in the western field; the first trends east to west in the southern end of the field; the second trends south-west to north east across the western end of the western field.
Vegetation	Trees and hedges form the field boundaries and are noted sporadically across the site.
General site sensitivity	The site is within a generally a rural area with residential properties and some commercial development to the east. A small area of fly tipping was found in the south-east corner of the eastern field.
Site boundaries and surrounding land	<p>Most of the site boundaries follow the field boundaries, which are formed of trees and hedge lines. However, most of the southern site boundary is offset to the north of the filed boundary, and therefore undefined, on the ground.</p> <p>The surrounding land is mainly farmland, with a residential property just off site to the south-west.</p> <p>Immediately to the east of the site there are excavation works possibly associated with earthworks as part of ongoing commercial development to the east of the site.</p>

3. OUTLINE CONCEPTUAL MODEL

3.1 Introduction

The outline Conceptual Model (oCM) in the Phase 1 Report incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an outline Conceptual Model is a key component of the LCRM methodology. The oCM incorporates a ground model of the site physical conditions and an exposure model of the possible contaminant linkages; it forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

Further details of the Desk Study and the oCM are provided in the Hydrock Phase 1 Report 16153-HYD-XX-XX-GE-DS-1001, which should be read in conjunction with this report.

3.2 Ground model

The preliminary ground model presented in the Hydrock Phase 1 report provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4).

The site currently comprises two adjacent arable fields, with a farm track running north to south through the eastern end of the western field. The farm track was noted to have a surface of crushed aggregate. The possibility that this contains crushed concrete and other demolition materials including asbestos containing materials (ACM) cannot be ruled out.

There are trees and hedges forming site and field boundaries, and sporadic vegetation across the site.

The site is approximately 28.5 ha in area and slopes down from the north-west to the south-east from approximately 95m to 84m above Ordnance Datum (m OD).

Review of historical Ordnance Survey mapping indicates very little change in land use from 1876 (the date of earliest mapping) to the present day, with only footpaths and field boundaries changing. The immediate surrounding area has also remained largely unchanged with the exception of land to the north-east where there was a lime kiln, quarry and railway in 1919 around 1km from the site and immediately east of the site where a commercial development was constructed in 2019/2020.

By 1981, there are residential properties approximately 500m to the east, with the commercial warehouses constructed in 2019/2020 immediately west of these properties.

A non-specialist UXO assessment indicates a low bomb risk.

The geology at the site is recorded by the BGS as Cornbrash Formation (limestone) overlying the Forest Marble Formation (limestone and mudstone). There are no superficial deposits recorded at the site. However, in the Hyder investigation, Superficial/Head Deposits were identified across the site, typically to depths of around 0.90m below ground level (bgl), but to a maximum depth of 1.80m bgl.

The Cornbrash Formation and the Forest Marble Formation are both Secondary A aquifers. However, the site is not within a Source Protection Zone and there are no groundwater abstractions within 500m of it.

There are a number springs in the surrounding area, possibly suggesting shallow groundwater.

There is a pond, approximately 30m wide, on the eastern boundary of the site, and the Gagle Brook flows from north-west to south-east approximately 400m south of it.

The Hyder report (2011) indicates possible naturally occurring arsenic in the area of the site at concentrations above the Generic Assessment Criteria (GAC).

The site development proposals are understood to comprise approximately 500 residential dwellings with associated gardens, open space and infrastructure.

3.3 Geotechnical hazard identification

3.3.1 *Context*

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table J.1 in Appendix H for further information).

3.3.2 *Plausible geotechnical hazards*

Plausible geotechnical hazards identified at the site are:

- Soft/loose compressible ground (low strength and high settlement potential);
- Shrinkage/swelling of the clay fraction of soils under the influence of vegetation;
- Lateral and vertical changes in ground conditions;
- Shallow groundwater;
- Changing groundwater conditions;
- Solution features in limestone and resultant cavities in the overlying superficial deposits; and
- Difficulty excavating through limestone beds.

3.3.3 *Potential development elements affected*

Development elements potentially affected by the geo-environmental and geotechnical hazards identified in the previous sections are:

- Buildings – foundations;
- Buildings – floor Slabs
- Roads and pavements;
- Buried services;
- Gardens;
- Construction staff, vehicles and plant operators;
- Concrete below ground.

Health and safety risks to site contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geo-environmental and geotechnical hazards and development elements affected have been carried forward for investigation and assessment. The investigation is described in Section 5 and the assessment is presented in Sections 6 and 7.

3.4 Geo-environmental exposure model

3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential pollution linkages, based on the source-pathway-receptor (SPR) approach.

A viable pollution linkage requires all the components of an SPR linkage to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

Potential on-site sources of contamination

- Pesticides and herbicides from agricultural practices (S1).
- Hydrocarbon vapours from potential VOC and petroleum hydrocarbon spillages/leaks associate with farm machinery (S2).
- Naturally occurring elevated concentrations of arsenic within soils (S3).
- PAH from on-site burning (identified as an activity undertaken very close to the site, and likely to have locally occurred on site) (S4).
- Spreading waste on agricultural land (identified as an activity undertaken very close to the site, and likely to have locally occurred on site) (S5).
- Use of waste in construction: asbestos wastes were historically commonly used to reinforce/repair site entrances. The use of demolition waste in the farm track may have resulted in the presence of ACM. (S6).

Potential off-site sources of contamination

- Pesticides and herbicides from agricultural practices (S7).
- Hydrocarbon vapours from potential VOC and petroleum hydrocarbon spillages/leaks associate with farm machinery (S8).
- PAH from on-site burning (identified as an activity undertaken very close to the site) (S9).
- Spreading waste on agricultural land (identified as an activity undertaken very close to the site) (S10).
- Use of waste in construction (identified as an activity undertaken very close to the site) (S11).

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- People (site users, neighbours) (R1).
- Development end use (buildings, utilities and landscaping) (R2).

- Groundwater: Secondary A aquifer status of the Cornbrash Formation and Principal aquifer status of the Forest Marble Formation (R3).

3.4.4 *Potential pathways*

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P1).
- VOC and petroleum hydrocarbon vapour ingress via permeable soils and/or construction gaps (P2).
- VOC, PAH and petroleum hydrocarbon contact with water supply pipes (P3).
- Root uptake by plants (P4).
- Migration of contaminant via leachate migration through the unsaturated zone in the Cornbrash Formation (P5).

Flow of surface water from the site to Gagle Brook receptor, and base flow of contaminated groundwater are considered unlikely due to its distance from the site.

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2020), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment. The investigation is presented in Section 5 and the assessment is presented in Section 7. An assessment of the Source – Pathway – Receptor linkages is undertaken following the assessment (Section 7) and is presented in Appendix I (Table K.1).

4. GROUND INVESTIGATIONS

4.1 Investigation rationale

The ground investigation rationale was based on the findings of the preliminary risk assessment and is summarised in Table 4.1.

Table 4.1: Investigation rationale

Location	Purpose
R01-08	To determine limestone thickness and competency. To assess ground conditions and to allow SPTs to be undertaken. To allow collection of soil samples for geotechnical characterisation and geo-environmental quality testing. Installation of gas and groundwater monitoring wells.
TP01-03, 05-36, 38-45, 47-50, 52-76, 78-83.	To provide general site coverage whilst also targeting proposed development areas and areas of public open space. To assess shallow ground conditions for shallow foundation design and undertake hand shear vane (HSV) testing. To allow collection of soil samples for contamination testing and geotechnical characterisation.
TP37 & TP51	To undertake soil infiltration testing in an area of proposed attenuation of surface water.
TP04, TP46, TP77	To undertake soil infiltration testing across the site, provide general coverage to target areas of proposed permeable paving for assisting in the design of SuDS.

4.2 Site works

The fieldworks for this investigation took place between 10th and 27th November 2020 and are summarised in Table 4.2. The ground investigation locations were surveyed in using a Total Station GPS survey instrument and are shown on the Exploratory Hole Location Plan (Hydrock Drawing 16153-HYD-XX-ZZ-DR-GE-1001) in Appendix A.

The logs, including details of ground conditions, soil sampling, *in situ* testing and any installations, are also presented in Appendix C.

The weather conditions during the fieldwork and for the previous week were overcast or raining.

Table 4.2: Summary of site works

Activity	Method	No.	Depth Maximum (m bgl)	<i>In situ</i> tests	Notes (e.g. installations)
<i>Drilling, Pitting and Probing</i>					
Boreholes	Rotary Cored	2	5.20	SPT	63mm HDPE wells with gas taps in all holes
	Rotary open hole	6	5.20		
Trial pits	Machine (13T 360)	83	3.50	Hand shear vane (HSV)	-
<i>Other in situ testing or monitoring</i>					
Infiltration	BRE 365	5	1.60	Infiltration	-

Wells for monitoring groundwater levels and ground gas concentrations were installed in all of the rotary boreholes. A summary of the monitoring well installations is presented in Table 4.3.

Table 4.3: Summary of monitoring installations

Location	Ground level (m OD)	Standpipe diameter	Screen top and base depth (m bgl)	Screen top and base elevation (m OD)	Strata targeted
R01	92.44	50	3.00 to 5.00	89.44 – 87.44	Forest Marble Formation
R02	94.68	50	1.50 to 5.00	93.18 – 89.68	Cornbrash Formation / Forest Marble Formation
R03	91.99	50	2.00 to 5.00	89.99 – 86.99	Forest Marble Formation
R04	90.71	50	1.50 to 3.50	89.21 – 87.21	Cornbrash Formation / Forest Marble Formation
R05	89.47	50	3.50 to 5.00	85.97 – 84.47	Forest Marble Formation
R06	89.7	50	3.00 to 5.00	86.70 – 84.70	
R07	86.86	50	2.70 to 5.00	84.16 – 81.86	
R08	86.04	50	1.00 to 3.00	85.04 – 83.04	

4.3 Geo-environmental testing

4.3.1 Sampling strategy and protocols

Exploratory hole positions were determined by reference to the site conditions and uncertainties identified in the Initial Conceptual Model.

No specific features were identified during the desk study as requiring targeted investigation and a reasonably even spacing was used. No specific sampling statistics or grid were utilised in this instance.

Samples were taken, stored and transported in general accordance with BS 10175:2011+A2:2017.

4.3.2 Geo-environmental monitoring

Gas monitoring boreholes have been monitored on four occasions. The results are presented in Appendix E. Monitoring is ongoing and this report will be updated on completion of the monitoring.

4.3.3 Geo-environmental laboratory analyses

The chemical test certificates for testing undertaken by Hydrock are provided in Appendix F. Wherever possible, UKAS and MCERTS accredited procedures have been used.

The geo-environmental analyses undertaken on soils are summarised in Table 4.4.

Table 4.4: Geo-environmental analyses of soils

Determinand Suite	Topsoil	Head Deposits	Cornbrash Formation
Hydrock minimum suite of determinands for solids*	26	4	4
Speciated aliphatic and aromatic banding Total petroleum hydrocarbons by HS-GC/MS and GC/FID (Hydrock Tier 2 TPH Suite)	1	1	-
Benzene, toluene, ethylbenzene and xylene (BTEX) by HS-GC/MS	1	1	-
MTBE (Methyl Tertiary Butyl Ether) by HS-GC/MS	1	1	-
BS 3882 Topsoil Suite	2	-	-
Pesticide/herbicide screen	5	-	-
WAC Full Solid Suite	1	1	1
*Hydrock minimum soil suite comprises: As, B (water soluble), Be, Cd, Cr (total), Cr (VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulfide, pH, asbestos fibres, speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID), total phenols and fraction of organic carbon			

The soils chemical test data are interpreted and assessed in Sections 7.3 and 7.4.

4.3.4 Geotechnical laboratory testing

The geotechnical tests undertaken by Hydrock are summarised in Table 4.5 and the test certificates are provided in Appendix D. Wherever possible, UKAS accredited procedures have been used.

Table 4.5: Summary of sample numbers for geotechnical tests

Test	Head Deposits	Cornbrash Formation	Forest Marble Formation
Natural moisture content	8	29	15
Atterberg limits	6	26	8
Particle size distribution (sieve/sedimentation)	2	7	2
Sulfate and aggressive chemical environment classification for buried concrete classification (full BRE SD1 suite)	3	13	7
Optimum Moisture Content / Maximum Dry Density Relationship (OMC / MDD) (2.5kg rammer), with hand shear vane at each compaction point	-	1	1
OMC / MDD Relationship (vibrating hammer)	-	2	-
Remoulded California Bearing Ratio (CBR) at optimum moisture content (soaked) (2.5kg rammer)	-	1	1
Remoulded CBR at OMC (soaked) vibrating hammer	-	2	-
Remoulded undrained triaxial shear strength at OMC	-	1	1
Particle density	-	3	1
Organic Matter	-	3	1
Uniaxial Compressive Strength (UCS)	-	-	3

The geotechnical test data are summarised in Section 5.4, with analysis and interpretation in Section 6.

5. GROUND INVESTIGATION RECORDS AND DATA

5.1 Physical ground conditions

5.1.1 Summary of strata encountered

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

All relevant data from the Hydrock investigation discussed in Section 4 are used from this point forward.

Details of the Hydrock ground investigation works are provided in the logs in Appendix C, a summary of the ground model is presented in Table 5.1 and the individual strata are described in the sections below. Relevant cross-sections and contour plans are presented in Appendix A.

Table 5.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
Topsoil	0.00	0.10 – 0.50	0.10 – 0.50	0.30
Made Ground*	0.20	0.30	0.10	0.10
Head Deposits	0.10 – 0.35	0.35 – 2.00	0.10 – 1.80	0.80
Cornbrash Formation	0.15 – 1.80	1.00 – 4.50	0.40 – 4.00	1.30
Forest Marble Formation	1.00 – 4.50	>1.60 - >5.20	Not proven	Not proven
*R05 only and recorded as fragments of concrete adjacent to the farm track				

5.1.2 Topsoil

Topsoil was encountered across most of the site, from surface, to depths of between 0.10mbgl and 0.50mbgl below ground level (bgl), with an average thickness of 0.30m. The Topsoil generally comprised soft to stiff dark brown and reddish brown variably sandy gravelly clay and stiff light yellowish brown organic slightly sandy slightly gravelly clay. The gravel component typically comprised limestone.

For the purposes of this report, Topsoil is defined as the upper layer of an in-situ soil profile, usually darker in colour and more fertile than the layer below (subsoil), which is a product of natural chemical, physical, biological and environmental processes.

Two composite samples of the topsoil were tested for compliance with BS 3882:2015 and an assessment has been provided by Tim O'Hare Associates (soil and landscape consultancy). Both samples were found to be compliant with BS 3882 when compared to multi-purpose topsoil on the basis of the grading (clay content). However, they were both found to be non-compliant when compared to multi-purpose topsoil on the basis of the available plant nutrients (nitrogen, carbon nitrogen ratio and pH). This does not preclude the use of the topsoil as a growing medium as long as it is recognised the topsoil will require regular application of general-purpose fertiliser. Subject to noting the above comments and subject to approval by the Client, the landscape architect or landscape contractors, the topsoil is considered suitable for re-use.

5.1.3 *Made Ground*

Made Ground was encountered in R05 only between 0.20mbgl and 0.30mbgl in the central south of the site and adjacent to a farm track (trending north to south). The Made Ground in R05 comprised concrete located adjacent to the farm track and was recorded as fragments. It is likely that this extends along the length of the farm track.

5.1.4 *Head Deposits*

Head Deposits were recorded across most of the site.

The Head Deposits were encountered from 0.10m bgl to 0.35m bgl, to depths of between 0.35m bgl and 2.00m bgl and with an average thickness of 0.80m.

The Head Deposits generally comprised soft to firm (locally stiff) orangish brown, reddish brown variably sandy gravelly clay with a medium cobble and boulder content; orangish brown, reddish brown variably sandy clayey gravel locally with a medium to high cobble and boulder content. The gravel, cobble and boulder component comprised limestone.

The Head Deposits consist of poorly sorted and poorly stratified sediments and are likely to have formed as a result of *in situ* weathering and possibly slow progressive downslope soil movement (solifluction) under freeze/thaw conditions.

5.1.5 *Cornbrash Formation*

Beneath the Topsoil or Head Deposits, the Cornbrash Formation was recorded across the site.

The Cornbrash Formation was encountered from 0.15m bgl to 1.80m bgl to depths of between 1.00m bgl and 4.50m bgl and with an average thickness of 1.30m.

The Cornbrash Formation was typically recorded as alternating bands of clay (weathered horizons) and intact rock (limestone) deposits of variable spacing and thickness.

The clay bands typically comprised firm to stiff orangish brown, grey and reddish brown variably sandy gravelly clay locally with cobbles. The gravel / cobble component comprised limestone.

The limestone bands comprised: very weak to medium strong orangish brown and greyish brown limestone, locally with shell fragments.

5.1.6 *Forest Marble Formation*

Beneath the Cornbrash Formation the Forest Marble Formation was encountered and proven to 5.20m bgl, with its base not proven.

The top of the Forest Marble Formation was typically recorded at a level of approximately 90m to 91m OD in the west of the site and at approximately 85m to 87m OD in the east of the site. It was encountered between depths of 1.00m bgl and 4.50m bgl and was typically recorded as alternating bands of clay (weathered horizons) and intact rock (limestone) deposits.

The clay bands typically comprised firm to very stiff grey sandy clay, grey brown, yellowish brown and orangish brown variably sandy gravelly clay, dark grey clay and greenish grey sandy clay. The gravel component comprised limestone and mudstone.

The limestone bands typically comprised weak to medium strong grey, orangish brown limestone interbedded with clay and occasional shell fragments; and weak greenish grey mudstone.

5.2 Groundwater

5.2.1 Groundwater observations and levels

Groundwater strikes encountered during the investigation are listed in Table 5.2. A groundwater observation represents the depth at which groundwater was first observed and is likely to be deeper than the actual water table level at that location.

Groundwater was not recorded in any of the rotary boreholes; however, any groundwater entries are likely to have been masked by the water flush used in rotary drilling.

Table 5.2: Groundwater occurrence

Stratum	Date	Location	Fieldwork		Comment
			Groundwater observation (m bgl)	Rose to after 20 mins (m bgl)	
Topsoil	20/11/2020	TP76	0.00	0.00	Surface water flooding
Head Deposits	13/11/2020	TP23	0.8	0.8	Moderate inflow
	16/11/2020	TP38	1.0	1.0	Moderate inflow
		TP39	1.0	1.0	Moderate inflow
	18/11/2020	TP41	0.8	0.8	Moderate inflow
	19/11/2020	TP25	0.8	0.8	Moderate inflow
		TP27	1.2	1.2	Moderate inflow
	20/11/2020	TP42	0.6	0.6	Moderate to rapid inflow
	24/11/2020	TP48	0.7	0.7	Moderate inflow
	25/11/2020	TP44	0.7	0.7	Moderate to rapid inflow
		TP68	0.8	0.8	Moderate inflow
	26/11/2020	TP45	0.8	0.8	Moderate to rapid inflow
		TP67	0.8	0.8	Moderate inflow
Cornbrash Formation	19/11/2020	TP07	1.8	1.8	Moderate inflow
		TP13	1.2	1.2	Moderate inflow
		TP14	1.4	1.4	Moderate inflow
		TP26	1.2	1.2	Moderate inflow
		TP28	1.3	1.3	Moderate inflow
		TP29	1.3	1.3	Moderate inflow
		TP31	0.8	0.8	Rapid inflow
	20/11/2020	TP49	1.0	1.0	Moderate inflow
	24/11/2020	TP47	0.9	0.9	Moderate inflow
	25/11/2020	TP43	0.9	0.9	Moderate inflow
		TP64	0.9	0.9	Moderate inflow
	26/11/2020	TP65	1.2	1.2	Moderate inflow

Stratum	Date	Location	Fieldwork		Comment
			Groundwater observation (m bgl)	Rose to after 20 mins (m bgl)	
		TP66	1.0	1.0	Moderate inflow
		TP80	1.5	1.5	Moderate inflow
		TP81	1.5	1.5	Moderate inflow
Forest Marble Formation	26/11/2020	TP82	1.5	1.5	Moderate inflow

Groundwater levels recorded during post-fieldwork monitoring are summarised in Table 5.3.

Table 5.3: Groundwater level data summary

Stratum	Date range	Location	Post-fieldwork monitoring	
			Depth to groundwater (range) (m bgl)	Groundwater elevation (range) (m OD)
Cornbrash Formation / Forest Marble Formation	03/12/20 – 11/01/20	RO2	0.70 – 1.17	93.51 – 93.98
		RO4	1.15 – 1.32	89.39 – 89.56
Forest Marble Formation		RO1	1.05 – 1.18	91.26 – 91.39
		RO3	0.88 – 1.06	90.93 – 91.11
		RO5	0.88 – 0.96	88.51 – 88.59
		RO6	0.94 – 1.04	88.66 – 88.76
		RO7	0.59 – 0.78	86.08 – 86.27
		RO8	0.34 – 0.53	85.51 – 85.70

5.2.2 Infiltration tests

The results of the infiltration testing undertaken are summarised in Table 5.4.

Testing was carried out in accordance with Hydrock's 1-day assessment methodology (see reference in Appendix J). This is in general accordance with BRE Digest 365 (BRE DG 2016) where infiltration rates allow three test runs during a working day (or where there is no infiltration), but where low infiltration rates were encountered the available time may not have been sufficient to fully comply with the BRE test method (i.e. three runs of the test).

Table 5.4: Infiltration test results

Stratum	Location	Depth to base of pit (m bgl)	Infiltration rate (m/s)	
			Run 1 (Runs 2 & 3 not undertaken where no or low infiltration)	Additional Notes
Head Deposits / Cornbrash Formation	TP04	1.60	No infiltration	Shallow groundwater recorded before start of the test at 0.53mbgl.
	TP46	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.47mbgl.
	TP51	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.84mbgl.
	TP77	1.50	No infiltration	Shallow groundwater recorded before start of the test at 0.53mbgl.
Cornbrash Formation	TP37	1.30	No infiltration	Shallow groundwater recorded before start of the test at 1.08mbgl.

*Where less than three tests were possible in a particular location the results provided should be considered indicative only and should not be used for design purposes. If infiltration is critical to the development of the site, multi-day infiltration testing should be undertaken.

5.2.3 Groundwater summary

In general, groundwater was encountered at shallow depth towards the base of the Head Deposits and in the Cornbrash Formation and the Forest Marble Formation. However, there are local variations in both the Cornbrash Formation and Forest Marble Formation probably associated with the alternating beds of clay and limestone recorded.

There is also deeper groundwater in the Forest Marble Formation, identified mainly in the south-east of the site, where this stratum is at shallow depth.

The hydraulic gradient of the groundwater, and hence the likely direction of flow, is generally towards the south/south-east, and these appear to be topographically controlled.

Infiltration rates were negligible, likely associated with the shallow depth of the groundwater and the presence of clay bands in the strata at the site.

5.3 Ground gases (carbon dioxide and methane)

Records from the gas monitoring boreholes are appended and summarised in Table 5.5.

To date four monitoring visits have been undertaken, with a further two visits to be undertaken as part of the current commission.

Table 5.5: Range of ground gas data

Stratum	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Steady flow rate (l/hr)	Comment
Cornbrash Formation / Forest Marble Formation	0.0	0.0 – 2.2	15.2 – 22.0	0 – 1.6	30 of 32 methane readings are below the limit of detection and all the carbon dioxide readings are below 5%.
Forest Marble Formation	0.0 – 0.1	0.1 – 2.2	15.9 – 22.1	0 – 1.8	

5.4 Geotechnical data

5.4.1 Introduction

Geotechnical laboratory test results are contained in Appendix D with *in situ* test results shown on the relevant exploratory hole log or datasheet in Appendix C. The following sections summarise the main findings and provide interpretation where appropriate.

5.4.2 Plasticity

The volume change potentials in terms of NHBC Standard (Chapter 4.2) with respect to building near trees have been determined from the results of plasticity index tests on samples of soil. These are summarised in Table 5.6.

Table 5.6: Volume change potential

Stratum	No. of tests	Plasticity Index			Modified Plasticity Index			Plasticity designation	Volume Change Potential
		Min.	Max.	Av.	Min.	Max.	Av.		
Head Deposits	6	19	38	24	17	36	22	Intermediate to high	Medium
Cornbrash Formation	26	15	39	25	7	37	23	Low to high	Medium
Forest Marble Formation	8	13	36	25	9	34	23	Low to high	Medium

5.4.3 Particle size distribution

Particle Size Distribution test (PSDs) results are summarised in Table 5.7 and summary descriptions and PSD plots of the material analysed are presented in Appendix D.

Table 5.7: PSD results summary

Stratum	No. of tests	Silt/Clay %	Sand %	Gravel %	Cobbles %	General description
Head Deposits	2	3 - 78	2 - 20	2 - 31	0 - 64	Slightly clayey slightly silty sandy gravelly cobbles to slightly sandy slightly gravelly clay/silt.
Cornbrash Formation	7	0 - 98	2 - 25	0 - 61	0 - 71	Limestone (recovered as variably clayey silty sandy gravel/cobbles) to slightly sandy slightly gravelly clay/silt.
Forest Marble Formation	2	90 - 93	5 - 7	0 - 5	0	Slightly sandy slightly gravelly silt/clay.

5.4.4 Soil strength

Table 5.8 summarises information pertaining to the shear strength of the cohesive soils, or the clay elements of mixed strata, according to their geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. hand shear vane) and uncorrected Standard Penetration Tests (SPT). Where the SPT is used to infer shear strength by published correlation, this is also tabulated. A shear strength versus depth profile is summarised in Figure 5.1, and plots are presented in Appendix D.

Table 5.8: Soil strength results and derived values

Stratum	No. of tests	SPT (N-value) (range)	c _u (kPa)	Method
Cornbrash Formation	7	13 - >50	95 - >370*	SPT – rotary boreholes.
	5	-	70 - 114	Hand shear vane
	1	-	114	Laboratory remoulded triaxial test
Forest Marble Formation	17	13 - >50	95 - >370*	SPT – rotary boreholes.
	1	-	100	Laboratory remoulded triaxial test

*Derived from Stroud (1975) correlation and updated to use N₆₀ after Stroud (1989) (F1 = 5)

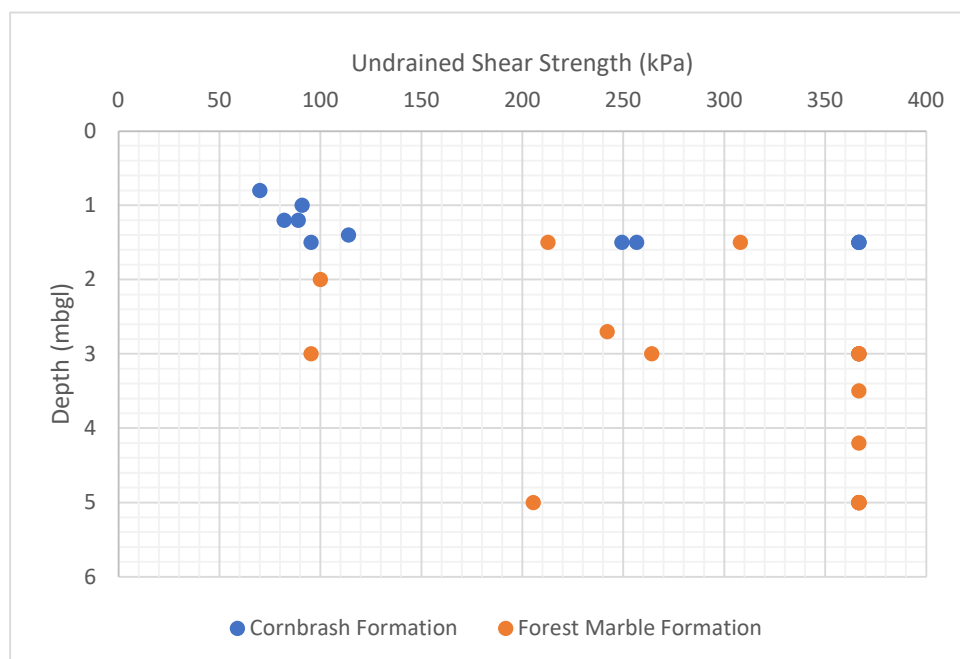


Figure 5.1: Undrained shear strength of clay soils versus depth summary

As shown by Figure 5.1, the strength profile of the Cornbrash Formation indicates typical undrained shear strengths of 70 – 90kPa around 1.00mbgl, sharply rising to in excess of 250kPa as depth increases and primarily due to a decrease in the degree of weathering and the presence of limestone bands.

The cohesive units in the Forest Marble Formation also show a highly variable but typically high undrained shear strength profile, with values in excess of 100kPa typically recorded. The variability and

high shear strength values in this stratum are due to the decrease in degree of weathering and presence of limestone (and locally mudstone) rock bands.

5.4.5 Compressibility

Table 5.9 presents a summary of the derived parameters for coefficient of consolidation and compressibility. The data indicates that the material is generally of low compressibility.

Table 5.9: Summary of compressibility

Stratum	No. of tests / results	Method	Coefficient of volume compressibility (m_v) (m^2/MN)
Cornbrash Formation	7	Correlation with SPT*	0.03 - 0.11
Forest Marble Formation	17	Correlation with SPT*	0.03 - 0.11

* f_2 values has been derived based on average plasticity index (Tomlinson (2001), after Stroud)).

5.4.6 Optimum Moisture Content / Maximum Dry Density relationship – compaction studies

Table 5.10 presents a summary of the compaction studies undertaken at the site.

Table 5.10: Compaction study results

Stratum	No. tests	Method	Natural moisture content (%) (range)	Optimum moisture content (%) (range)	Particle density (Mg/m^3) (range)	Maximum dry density (Mg/m^3) (range)
Cornbrash Formation	1	2.5kg Rammer	19	16	2.66	1.82
	2	Vibrating Hammer	3.1 - 11	8 - 9	2.72 – 2.75	2.11 – 2.21
Forest Marble Formation	1	2.5kg Rammer	26	26	2.67	1.55

5.4.7 Subgrade stiffness

The subgrade stiffness (CBR and derived Modulus of Subgrade Reaction) results are summarised in Table 5.11.

Table 5.11: CBR results and derived values

Stratum	No. tests	Method	Modulus of Subgrade Reaction k (MN/m ² /m) (Range)	CBR (%) (Range)
Head Deposits	-	Correlation in accordance with CD 622 and TRRL 1132 based on average plasticity and thin construction	25 – 27	2.5 – 3.0
Cornbrash Formation	1	Laboratory remoulded sample at Optimum Moisture Content (OMC) (2.5kg rammer)	36 – 44	4.8 – 6.9
	2	Laboratory remoulded sample at Optimum Moisture Content (OMC) (Vibrating Hammer)	129 – 345*	44 – 237*
	-	Correlation in accordance with CD 622 and TRRL 1132 based on average plasticity and thin construction	27 – 155*	3 – 60*
Forest Marble Formation	1	Laboratory remoulded sample at Optimum Moisture Content (OMC) (2.5kg rammer)	40 – 41	5.8 – 6.1
	-	Correlation in accordance with CD 622 and TRRL 1132 based on average plasticity and thin construction	27 – 155*	3 – 60*

Where using the CD 622 and TRRL 1132 method, 'k' has been back calculated from the Equivalent CBR

*Higher values associated with limestone bands.

5.4.8 Sulfate content

In accordance with BRE (Special Digest 1), the Design Sulfate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 5.12. The assessment summary sheets are presented in Appendix D.

Table 5.12: Aggressive chemical environment concrete classification

Stratum	No. tests	DS	ACEC
Head Deposits	3	DS-1	AC-1*
Cornbrash Formation	13	DS-1	AC-1*
Forest Marble Formation	6	DS-4	AC-4

*increase to AC-2z in flowing water (pure or with >15mg/l carbon dioxide)

5.4.9 *Intact material strength – rock*

Three unconfined compressive strength (UCS) test were carried out on samples of rock core from the Forest Marble Formation. UCS values in the range of 0.5 – 31.2 MPa were recorded (very weak to medium strong).

The test results are included in Appendix D.

6. GEOTECHNICAL ASSESSMENT

6.1 Geotechnical categorization of the proposed development

Eurocode 7, Section 2 (EC7) advocates the use of geotechnical categorization of the proposed structures to establish the design requirements.

The proposed development is to comprise low rise (2 to 3 storey) residential dwellings, with associated gardens, Public Open Space and infrastructure. In addition, the surface water drainage strategy indicates an attenuation pond in the central south of the site. Hydrock are not aware of any earthworks proposals at the site at this stage, however it is assumed that some cut to fill to construct an impounding bund for the attenuation pond will be required.

Based on the above, for the purposes of this investigation, the proposed attenuation pond could be classed as Geotechnical Category 2. However, the houses are classed as Geotechnical Category 1 structures. For Category 2 structures, the Geotechnical Category should be reassessed at the design stage and a specific geotechnical design report (in addition to this investigation), will be required in accordance with EC7.

Following ground investigation and as part of the assessment provided in the following section, the preliminary geotechnical hazard identification undertaken in Section 3.3 has been updated.

Assessment has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The preliminary Geotechnical Risk Register following investigation is provided in Appendix H (Table J.3) and will need to be updated during future design works.

6.2 Characteristic design values

The designer should determine suitable geotechnical design values for the Category 2 structures as part of the separate geotechnical design. However, the proposed houses are considered to be Geotechnical Category 1 structures and Table 6.1 provides characteristic geotechnical values to inform the design of these structures, and to assist the designer of the Category 2 structures.

These values have been determined from laboratory testing, *in situ* testing and by professional judgement using published data together with knowledge and experience of the ground conditions. Care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing is required for certain purposes. The reader should refer to the test results summarised in Section 5 and provided in Appendix C and Appendix D.

Table 6.1: Geotechnical parameters recommended for design of Geotechnical Category 1 Structures (EC7)

Parameter	Bulk unit weight kN/m ³	Effective angle of internal friction °	Effective cohesion kN/m ²	Undrained shear strength kN/m ²	Coefficient of compressibility m ² /MN	Modulus of subgrade reaction (IAN73/06) MN/m ² /m
Stratum	γ^a	$\phi'^{b,c}$	c'^d	c_u^e	m_v^f	k^g
Head Deposits	20	26	0	50 - 60	0.12	26
Cornbrash Formation (weathered to clay)	21	26	0	70 – 110	0.10	30
Cornbrash Formation (intact)	22	26	-	110 - >250	-	120
Forest Marble Formation (weathered to clay)	21	26	0	90 – 100	0.10	30
Forest Marble Formation (intact)	22	26	-	>250	-	120

a. Measured as part of the triaxial strength test and estimated based on the recommendations of BS 8004-2015.
b. Internal friction (ϕ') values for the granular in situ material derived from SPT data following the recommendations of Peck et al., (1967).
c. Internal friction (ϕ') values for the cohesive in-situ material derived from BS 8004-2015, where ϕ_{cv}' is derived from plasticity index. The use of ϕ_{cv}' in the analysis is considered to provide a conservative estimate of ϕ' .
d. BS 8002:1994 Code of practice for Earth retaining structures, British Standards institution.
e. Site measurements and laboratory data.
f. Derived from SPT N values (after Stroud (1975)
g. Based upon laboratory data and the equilibrium long term CBR from DMRB IAN 73/06 Rev 1 Table 5.1.

6.3 Groundwork

6.3.1 Site preparation

The site is previously undeveloped and generally no buried man-made obstructions were encountered by this investigation. However, locally concrete fragments were recorded in R05 adjacent to the farm track. Additionally, obstructions associated with the farm track should be anticipated. Therefore, it is recommended that an allowance be made for breaking out obstructions, for example provision of pneumatic breakers for site plant.

Topsoil should be removed from beneath all building and hardstanding areas.

6.3.2 Groundworks

Excavation of shallow soils should generally be feasible using conventional plant and equipment. Heavy duty excavation plant/breaking equipment will likely be required to excavate obstructions caused by the limestone of the Cornbrash Formation and the Forest Marble Formation, especially with depth below about 2m.

Trial pit faces were noted to remain generally vertical without collapse, and the faces of shallow, near vertically sided excavations put down at the site are likely to remain stable for short periods of time.

However, the Cornbrash Formation and the Forest Marble Formation can be fractured in the limestone beds and fissured in the clay beds and whilst instability due to fissuring or fracturing was not noted in the short trial pit excavations, fissuring or fracturing can cause instability of longer term excavations. Therefore, random and sudden falls should be anticipated from the faces of near vertically sided excavations put down at the site.

Temporary trench support, or battering of excavation sides, is recommended for all excavations that are to be left open for any length of time and will definitely be required where man entry is required. Particular attention should be paid to excavation at, or close to, site boundaries and adjoining existing access roads, where collapse of excavation faces could result in damage or risks to the safety of personnel.

A risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations (2015); Construction Information Sheet 47: Inspections and Reports (2005) and HSG47: Avoiding Danger from Underground Services.

To ensure no loads are imposed on the sides of the excavation, spoil should not be placed immediately adjacent to the excavation. Spoil should be placed a suitable distance from the side of the excavation (as assessed by a competent person).

Based on site observations, the rate of water ingress to the proposed excavations is likely to be moderate to fast and at shallow depths (typically encountered between 0.60m and 1.50mbgl). In these circumstances, groundwater control by sump pumping is unlikely to be sufficient to deal with anticipated flows and alternative methods of dewatering, such as well points, or use of impermeable cut-offs should be allowed for.

However, it should be recognised that groundwater levels may vary from those at the time of the investigation, for example in response to seasonal fluctuations and the timing of construction may dictate the extent of groundwater control required.

Any water pumped from excavations may need to be passed via settlement tanks (to reduce suspended solids) before being discharged to the sewer. Discharge consents may also be required.

6.3.3 Earthworks/reuse of site-won materials

At this stage, Hydrock is not aware of proposals for earthworks at the site. However, it is likely limited cut to fill will still be required. Therefore, an initial assessment has been completed on the potential to reuse site-won materials as a General Fill material. This is summarised in Table 6.2.

Table 6.2: Preliminary earthworks assessment

Stratum	Proposed end use	Preliminary classification (SHW Series 600)	Comment	Suitability for improvement by the inclusion of binders
Topsoil	Open Space	Class 4 (Landscape Fill)	Unsuitable for General Fill due to high organic content. Can only be used in areas which are not sensitive to settlement.	Unlikely to be suitable
Head Deposits	External Areas	Class 2A General Cohesive Fill	Likely to be wet of optimum, moisture conditioning (e.g. lime modification) likely to be required.	Likely to be suitable.
		Class 1A General Granular Fill		
Cornbrash Formation	External Areas	Class 2A General Cohesive Fill	Initial testing recorded soils as both wet and dry of optimum and moisture conditioning (e.g. lime modification or wetting up) likely to be required.	Likely to be suitable.
		Class 1A General Granular Fill		
Forest Marble Formation	External Areas	Class 2A General Cohesive Fill	Initial testing recorded soils are close to the OMC. However, it is likely these soils may also be encountered wet or dry of OMC and moisture conditioning (e.g. lime modification or wetting up) likely to be required.	Unlikely to be suitable due to the high sulfate concentrations.
		Class 1A General Fill		

Before the use of hydraulic binders is approved, comprehensive testing will need to be completed by a specialist Contractor to satisfy both themselves and the Engineer of the suitability of the soils for treatment and to confirm that the requisite end-performance of the material is achievable. In all instances where improvement by the inclusion of binders is considered, a mix design is required and as part of this design, samples should be checked for swelling, even where very low sulfate values are recorded.

Where it is proposed to reuse site won materials as an engineered fill it will be necessary to develop an appropriate Site Specific Earthworks Specification. The basis for the Specification should be BS 6031:2009 and the latest version of the SHW, Series 600 Earthworks. Once site proposals have been further defined more specific consideration will need to be given to the reuse of materials and reference should be made back to Hydrock.

Any earthworks are likely to need to be undertaken under a Materials Management Plan (see Section 8.3).

6.4 Foundations

This section provides recommendations for the foundations for houses, garages and related buildings as indicated on Countryside Properties PLC Drawing HV-01-SK08 dated October 2020.

The recommendations in this report are based on the current NHBC Standards (2020).

In accordance with EC7, BS EN 1997-1+A1 (2013) whilst the attenuation pond is considered to be Geotechnical Category 2 structures, the proposed buildings are considered to be Geotechnical Category 1.

Subject to detailed geotechnical design, the safe bearing pressures for foundations in this report take into consideration the risk of shear failure of the ground (ultimate limit state). However, they do not assess acceptable limits of settlement (serviceability limit state). Serviceability limit state assessment will need to be undertaken as part of the separate geotechnical design.

6.4.1 *Foundation types*

On the basis of the ground conditions indicated from the current investigations, the foundation recommended are as follows:

- Strip/trench fill foundations across the majority of the site (with deepening due to trees as required to a maximum depth of 2.5m bgl); and
- Piled foundations, where foundations need to be deepened to depths in excess of 2.5m bgl due to newly placed fill or tree influence in shrinkable soils.

6.4.2 *Trench fill/strip foundations*

Based on current ground levels, strip or trench fill foundations are considered suitable across most the site, constructed below any Made Ground, soft layers in the underlying deposits (Head Deposits, Cornbrash Formation and Forest Marble Formation), or Fill placed to raise levels. Foundations should be constructed at least 300mm into the undisturbed natural strata, which comprise clay of the Head Deposits, or clay or rock of the Cornbrash Formation and Forest Marble Formation. A minimum foundation depth of 0.90m bgl should be used to comply with NHBC requirements to guard against ground movements from seasonal changes in clays of Medium volume change potential. This applies in areas to be left at original ground level and in areas of cut / reduced ground level. In areas of fill / raised ground level, the foundations should be 0.90m below finished ground level and 300mm below the top of the in situ ground, and at a level with sufficient strength to support the applied foundation pressure. A permissible net bearing pressure of 125kN/m² is considered appropriate for foundations up to 1.0m wide. If enlarging the foundations is considered (for example because loads are such that the quoted safe net bearing pressure is inadequate) this could lead to increased settlements and the above recommendations should be reviewed.

Foundations may need to be deepened to penetrate strata unsuitable for founding, as noted above, or to below the depth of influence of trees and roots.

As shrinkable clays are interbedded with beds of limestone, locally, excavation through the limestone may be necessary to achieve the required founding depth.

Where foundation depths are stepped, for instance to match changes in depths due to trees or changes in ground conditions, the steps should be designed in accordance with the requirements of the NHBC Standards.

If trees are to be removed, the roots should be grubbed out and foundations extended to below the zone of disturbance created by this activity and to below any remaining root hairs. In addition, deepening of foundations in accordance with NHBC Standards will be required where strip or trench fill foundations are within the zone of influence of existing, removed or proposed trees and proposed shrub planting. An updated tree survey should be undertaken by an arboriculturist in accordance with BS 5837:2012 to identify the type, and height of existing trees on the site and including any off-site trees, which could have an effect on foundation design.

Where foundations are within the zone of potential desiccation from trees and are deeper than 1.5m bgl, a suitable compressible material or void former will be required on the inside faces of foundations to external walls.

Excavation of trench fill foundations in excess of 2.5m bgl is unlikely to be uneconomical and where required, piled foundations are recommended. However, if it is proposed to construct trench fill foundations deeper than 2.5m depth, they need to be designed by a Structural Engineer in accordance with the requirements of the NHBC Standards (Chapter 4.2.8) and NHBC Technical Requirement R5. Furthermore, if it is proposed to construct trench fill foundations deeper than 2.5m due to tree influence, the design should take into account soil desiccation risk based on plot specific testing.

Foundation formations should be inspected by a geotechnical engineer or other suitably competent person to ensure the founding conditions are suitable and as indicated in this report. Any formation materials deemed as unsuitable should be excavated and replaced with lean mix concrete, or the foundation deepened to a suitable bearing stratum. If this is not possible, consideration should be given to piling the foundation.

As the ground conditions at foundation level are likely to be of variable type and stiffness, it is recommended that mesh reinforcement be installed at the top and bottom of the foundation.

Foundation excavations should be protected from rainfall, inflow of surface water, frost and freezing conditions. They should also be protected from drying out in hot dry weather.

Groundwater monitoring indicates a shallow groundwater table and excavations may be difficult to undertake. Alternative methods of groundwater control may be required as moderate to fast groundwater ingress is anticipated, which could result in unstable excavations.

The clays of the Head deposits, Cornbrash Formation and Forest Marble Formation are over consolidated clays, which can swell and soften in contact with water. Therefore, care will be required to ensure that foundation excavations are kept as free of water as practicable. Foundation concrete should be poured as soon as practicable after excavation.

6.4.3 *Piled foundations*

Depending on column loads and layouts, piles should extend through the Made Ground and any newly placed fill and to a suitable depth into the underlying Head deposits, Cornbrash Formation and Forest Marble Formation.

Driven piles with rock shoes/rotary drilled piles with the use of casing/ CFA piles with rock bits should be suitable to support the foundations for the proposed structures. However, the choice of piling system should be undertaken by a specialist piling Contractor and the design of piles is beyond the scope of this report. The decision on pile type and design should take into account the following factors relevant to the site:

- Obstructions in the ground are expected from limestone beds, which could cause piles to stop shallower than the design depths, or to deviate from the vertical, thereby reducing their capacity. In some circumstances, obstructions can lead to pile breakage.
- Groundwater levels are shallow and temporary casing may be required for bored piles. If CFA piles and possibly also rotary drilled piles are used, concrete can be placed as the auger/bit is withdrawn, which can balance the water pressure if the operation is undertaken carefully.
- Piles should extend a minimum of five pile diameters into the bearing stratum to mobilise sufficient end-bearing resistance to carry the required loads without unacceptable settlement.
- As the piles may have fill placed over them, piles should also be designed to cater for the potential down-drag effects of negative skin friction on piles from the secondary consolidation/creep of any recently placed fill.
- Where bored piles extend through very soft ground, bulging of the concrete can occur, leading to lateral pressure on adjacent piles.
- Where foundations are constructed on clay soils within the influencing distance of trees design should include for the upper section of the pile to be sleeved or additional length allowed for to resist stresses from clay swelling or shrinkage. In addition, heave protection may be required on the inside faces and underside of the ground beams.

6.5 Ground floor slabs

In accordance with the NHBC standards, as the site is underlain by clay soils of medium volume change potential it is recommended that suspended floor slabs with a void be adopted.

Slabs without a void (ground bearing or suspended cast *in situ* onto the ground) may be used if all of the following criteria are satisfied:

- the foundation depth (such as due to the influence of trees) is less than 1.5m;
- any fill is suitable, well-compacted granular material and less than 600mm thick;
- it is demonstrated that the soils are not desiccated and are at their equilibrium moisture content; and
- ground floor construction is not undertaken when the surface soils are seasonally desiccated (i.e. during summer and autumn), unless NHBC is satisfied the soil is not desiccated.

Ground floor slabs should be designed to incorporate any gas mitigation measures that may be required, as discussed later within this report.

6.6 Roads and pavements

Based on the test results and subject to *in situ* testing during construction, it is considered likely an equilibrium CBR of 2.5% will be achievable over the majority of the site.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.

Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in

accordance with DMRB IAN 73/06 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

Where the CBR is found to be less than 2.5%, the sub-grade may be unsuitable for both the trafficking of site plant and as support for a permanent foundation, without improvement works being undertaken. Improvement works should be carried out in accordance with DMRB IAN 73/06 Rev 1 Chapter 5. In summary, consideration may be given to the following potential remedial techniques:

- excavation and re-engineering or replacement of weaker soils;
- the inclusion of geosynthetic reinforcement within the unbound layers of the capping and sub-grade;
- where cohesive soils are present and they are deemed suitable for treatment (excluding the Forest Marble Formation where elevated sulfates have been recorded) with hydraulic binders, to employ modification and/or stabilisation techniques on the formation; and
- where granular soils are present, de-watering and re-engineering the formation.

6.7 Drainage

Indicative infiltration rates for the ground investigation are presented in Appendix D and are summarised in Table 5.4.

Soakaways are considered unsuitable for the site based on the negligible infiltration rates obtained from testing and shallow groundwater table encountered beneath the site.

Given the shallow groundwater present at the site, Hydrock consider that the attenuation pond should be lined to prevent groundwater ingress.

It should be noted that if it is proposed to line the pond, the potential hydrostatic uplift needs to be taken into account with the design and the liner will need to be placed at an over excavated depth and covered with soil to prevent the liner lifting.

6.8 Buried concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005) and the information presented in Section 5.4.8 (Table 5.12):

- The Head Deposits and Cornbrash Formation can be classified as Design Sulfate Class DS-1 and ACEC Class AC-1.
- The Forest Marble Formation can be classified as Design Sulfate Class DS-4 and ACEC Class AC-4.
- The ring beams of piles, (which will be constructed within the Head Deposits and Cornbrash Formation) can be classified as Design Sulfate Class DS-1 and ACEC Class AC-1. However, due to minimal disturbance, whilst the clays of the Forest Marble Formation are potentially pyritic, piles can be classified as Design Sulfate Class DS-3 and ACEC Class AC-3.

This equates to a Design Chemical Class¹ of:

- DC-4 for the shallow soils (trench/strip fill foundations)

¹ The calculated ACEC class can be used in accordance with BS 8500-1+A2 (2019), Table A.9 to select the Designated Concrete (DC) class for an intended working life of 50 years. However, the designer is referred to BS 8500-1+A2 (2019), for full details and notes to Table A.9, including any Additional Protective Measures (APMs).

- DC-3 for piles.

The designer should check and confirm the classification of concrete using the information presented in Appendix C and Appendix D during the design.

7. GEO-ENVIRONMENTAL ASSESSMENT

7.1 Updated conceptual model

7.1.1 *Updated ground model*

The preliminary ground model developed from the desk study and field reconnaissance survey ((reference: 16153-HYD-XX-XX-RP-GE-1001) has been updated using the findings of the ground investigation and is presented in Section 5. This ground model is the basis for the geo-environmental assessment presented in this section.

7.1.2 *Updated exposure model*

Following the ground investigation, the plausible contaminant sources, receptors and pathways identified in the preliminary geo-environmental exposure model (Section 3), have been updated or confirmed as follows.

Sources

No potential sources have been removed from, or added to, the exposure model.

Receptors

As significant contamination has not been identified on the site during the Hydrock investigation, the site is not in a SPZ, nor in close proximity to any licensed abstractions, and is underlain by bands of impermeable clay strata (in the Cornbrash Formation and Forest Marble Formation) there is a negligible risk to Controlled Waters and the following potential receptors have therefore been removed from the exposure model.

- Groundwater: Secondary A aquifer status of the Cornbrash Formation and Principal aquifer status of the Forest Marble Formation (R3).

Pathways

No pathways have been removed from, or added to, the exposure model.

Using the updated ground model and updated exposure model, generic risk assessment is undertaken as presented below.

7.2 Risk assessment approach

Generic risk assessments have been undertaken in accordance with the principles of LCRM (Environment Agency, 2020) using the CM that has been updated following the ground investigation.

Firstly, the risks associated with the identified potential contaminant linkages have been estimated using standardised methods (typically involving comparison of site data with published 'screening values'). Secondly, where screening values are exceeded, the result has been evaluated in an authoritative review of the findings with other pertinent information to determine whether or not the exceedance is, or is not acceptable in the site-specific circumstances. Further explanation is presented in Appendix J.

The data sets used in the assessment comprise the analytical results obtained by Hydrock as listed in Section 4.

In cases where unacceptable risks are indicated, actions such as more advanced stages of risk assessment or remediation are proposed.

7.3 Human health risk assessment

This is a Tier 2 assessment using soil screening values applicable to the residential with plant uptake CLEA land use scenario.

The soil screening values used are generic assessment criteria (GAC). It should be noted that Category 4 Screening Levels (C4SL) for lead have been used as there is no recognised GAC for lead and the use of the term 'GAC' in this report includes the C4SL for lead.

Statistical testing is used where data sets are suitable. The critical issue is sample numbers. For data sets with low sample numbers and / or where sampling is targeted at specific areas, individual sample test results are compared directly with the screening values. Larger and non-targeted data sets are subject to statistical testing.

The phrase 'further assessment required' is used to denote soil concentrations that are equal to, or exceed, a GAC. This does not necessarily mean that the soil is 'contaminated' or not otherwise suitable for use. The assessment and any mitigation required are to ensure the site does not pose an 'unacceptable risk'.

The results of the assessment are presented in Appendix F.

7.3.1 Averaging areas

The 'averaging areas' used in this report are based on the conceptual model and the proposed development, and comprises the whole site with the data split into the topsoil and natural soils.

Statistical testing has been used for the Hydrock default list of determinands in the Topsoil and natural soils. The results of the pesticide screen and petroleum hydrocarbon testing are also compared directly against the screening values due to lower sample numbers.

7.3.2 Risk estimation (including statistical testing)

Outliers

The data set for each chemical determinand has been assessed for potential outliers (based on the conceptual model). No outliers have been removed.

Statistical assessment

In accordance with the guidance provided by the CIEH (May 2008) the 95th upper confidence level on the true mean (US₉₅) has been calculated from the sample data. Reference to the methodology for statistical assessment is given in Appendix J.

Hydrock Suite

There were not any US₉₅ exceedances of the GACs for the chemicals of potential concern (CoPC) screened in either the Topsoil or the natural soils. This includes no exceedances for arsenic which was identified as being naturally occurring in the Hyder (2011) report.

Asbestos

Asbestos fibres were not recorded during the laboratory testing.

Petroleum Hydrocarbons

There were not any exceedances of the GACs for petroleum hydrocarbons.

Pesticide Screen

Pesticides were identified in the Topsoil of TP64 at 0.10m only (recorded by a screening test to identify 'presence of'). The presence of pesticides requires further consideration.

7.3.3 Risk evaluation

The screening exercise has identified pesticides in the topsoil at one location, TP64 at 0.10m. This is considered further here to assess if the presence of pesticides may be acceptable with respect to the proposed development. The phrase 'further assessment' does not necessarily mean that the soil is 'contaminated' or not fit for use.

Pesticides

The presence of pesticides was recorded in TP64 at 0.10m in the topsoil. There are no published GACs available for the specific chemicals identified during the test and therefore the presence of these chemicals *may* provide a risk to site end users.

It is recommended that repeat samples of the topsoil are taken and tested from the area of TP64 to:

- Confirm the presence (or absence following pesticide degradation) of these chemicals;
- Delineate the immediate vertical and lateral extents of recorded pesticides, particularly around TP64; and
- Assist in identifying if remedial works are required.

Subject to this, and confirmation by a soil scientist, the topsoil is considered suitable for re-use.

7.4 Plant life risk assessment

7.4.1 Risk estimation

Priority phytotoxic chemical concentrations have been screened against published values to determine the likely risk to plant growth and the findings presented in Appendix F. As with human health, statistical testing is used where data sets are suitable, otherwise individual sample test results are compared directly with the screening values.

None of the US₉₅ values exceed the GAC for the CoPC screened in either the Topsoil or the natural soils.

Based on the test results summarised in the previous sections, Hydrock considers that no further assessment is required for plant life in relation to soil contamination at the site.

7.5 Ground gases risk assessment

7.5.1 Data

It is judged from the available evidence that the gas generation potential at the site is low (due to minimal Made Ground and no sources present on site) and that the sensitivity of the development is high (due to a residential end use). Consequently, and in accordance with CIRIA C665 (Table 5.5a and 5.5b), an appropriate minimum monitoring regime is 6 readings over 3 months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2015 +A1:2019 suggests monitoring should include a period of falling atmospheric pressure).

Hydrock has undertaken four of the six readings required, including periods of falling and low atmospheric pressure, and as such, the conclusions presented below are considered interim, pending a review of ongoing ground gas monitoring.

7.5.2 Assessment

The risks associated with the ground gases methane (CH₄) and carbon dioxide (CO₂) have been assessed using BS 8485:2015 +A1:2019, which cites the guidelines published by CIRIA (Wilson et al 2007) (known as Situation A).

There is an alternative assessment method described by the NHBC (Boyle and Witherington 2007) (known as Situation B). Whilst 'Situation B' may also be suitable for the assessment, it is Hydrock's opinion that the NHBC Guidelines are not at the current time fully aligned with current ground gas risk assessment principles (as described in BS 8485:2015 +A1:2019). As such, 'Situation A' has been chosen as the means by the gas risk will be assessed.

The assessment guidelines published by CIRIA are based on interpretation of the gas concentrations and the gas flow rates, amongst other variables, and are compliant with the model procedures of LCRM. The modified Wilson and Card assessment has been used by comparing the maximum gas concentrations and gas screening values (GSV²) in Appendix D with the published table (CIRIA Table 8.5) and the assessment is summarised in Table 7.1. The assessment is presented in Appendix E.

In addition, Table 7.1 summarises a ternary plot assessment of the data (assessment of ground gas ratios (O₂ + N₂, CO₂ and CH₄)), undertaken in general accordance with guidance by Wilson et. al. (2018). The ternary plot assessment is presented in Appendix E.

² Note: GSV is synonymous with 'site characteristic hazardous gas flow rate' (Q_{hgs}) of BS 8485:2015 +A1:2019 Table.

Table 7.1: Ground gas risk assessment

	Min	Max	Typical ⁽¹⁾	Comment
Steady Flow Rate (l/hr)	0.0	1.8	<1	-
Methane (%)	0.0	0.1	<1	Methane has consistently been recorded at concentrations below 1% and carbon dioxide at concentration below 5%. Assessment of the data on a ternary plot of ground gas ratios (O ₂ + N ₂ , CO ₂ and CH ₄), in accordance with guidance by Wilson et. al. (2018), indicates the ground gas present is likely to represent fresh air.
Carbon Dioxide (%)	0.1	2.2	<5	
Oxygen (%)	15.2	22.1	20	-
Carbon Dioxide GSV based on Maximum Values (Site) (l/hr)	0.0001	0.0396	<0.07	CS1
Methane GSV based on Maximum Values (Site) (l/hr)	0.0	0.0018	<0.07	CS1

For the purposes of the calculation, where the recorded gas flow rate is below the manufacturer's limit of detection for the instrument used, the detection limit has been adopted for the gas flow rate.

As indicated in Table 7.1, the computed GSV for carbon dioxide and methane indicates CS1 conditions and methane and carbon dioxide at concentrations are 'typically' below 1% and 5% respectively. As such, the site is provisionally classified as Characteristic Situation 1 (Situation A), subject to the completion of the gas monitoring programme.

Based on the data to date no mitigation measures are required.

7.5.3 Off-site risks from carbon dioxide and methane

The National Planning Policy Framework [in England] requires that a developed site should be incapable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990. This position includes a consideration of the potential for off-site migration of ground gases that may impact on adjacent properties.

Consequently, it may be necessary to consider the imposition of measures to protect adjacent, off-site receptors. In this case due to the negligible ground gas level recorded, this is not required.

7.6 Construction materials risk assessment

7.6.1 Water pipelines

A formal water pipe investigation and risk assessment is beyond the scope of this report. However, the findings of this investigation have been compared to the threshold values in Water UK HBF (2014), Table 1 as far as is practicable, to give an indication of the possible restrictions to the use of plastic pipes for water supply to the site (see the reference in Appendix J for further information).

The site is previously undeveloped and the preliminary risk assessment and investigation has indicated no significant contaminant sources. It is envisaged that standard pipework will be suitable for the site. However, confirmation should be sought from the water supply company at the earliest opportunity.

7.6.2 *Other construction materials*

Plastic pipes for drains and sewers are manufactured from unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) or polyethylene (PE). These materials may be affected by the presence of organic compounds in the soil.

In accordance with the British Plastics Federation Guidance (August, 2018), as the concentrations of PAH, and BTEX are below 100mg/kg and the concentrations of petroleum hydrocarbons (TPH) are below 200 mg/kg, PVC-U, PP or PE pipework is considered suitable.

The implications for buried concrete are discussed in Section 6.8.

7.7 Contamination risks to ground workers

7.7.1 *Introduction*

Whilst risks to construction workers are not discussed in detail, the following section discusses potential risks that should be considered.

Information presented in this document is provided to assist in managing the risk associated with contamination in soil and groundwater at the site but is not definitive. The Contractors are responsible for undertaking their own assessments and assessing what risks are present and what control measures are required.

Task specific risk assessments and method statements should be in place, and risks and required mitigation measures communicated to all relevant personnel prior to the works commencing. Appropriate PPE and, if required, RPE should be provided and utilised.

7.7.2 *Metals, metalloids, PAH and petroleum hydrocarbons*

Metals, metalloids, PAH and petroleum hydrocarbons have not been recorded above the respective GACs at the site.

7.7.3 *Ground Gas*

It is noted that concentrations of carbon dioxide (an asphyxiant) in the soil exceed HSE Workplace Exposure Limits for personnel in the working environment of 1.5% for short term (15 minutes) exposure and 0.5% for long term exposure. Furthermore, soil concentrations of oxygen are below the HSE recommendations of 18%.

Soil gas concentrations are not necessarily reflected by those in the breathing zone, as such, all Contractors and maintenance workers should be made aware of the possible presence of carbon dioxide and should take all necessary health and safety precautions when working in trenches or confined spaces.

7.7.4 *Asbestos*

As no clearly identifiable ACM has been seen during the site walkover or during the ground investigation and no fibres have been detected in soil samples analysed by laboratory testing, CAR2012 does not apply. However, there is always the possibility of encountering contamination, including from the farm access track. The contractors should undertake a watching brief during the works. If any suspect material is encountered, works in that area of the site should stop, the area fenced off and Hydrock should be notified.

7.8 Findings of the generic contamination risk assessments

The potential sources, pathways and receptors identified in the desk study have been investigated (Sections 4 and 5) and assessed (Sections 7.2 to 7.6). A Source-Pathway-Receptor linkage assessment has been undertaken and is presented in Appendix I (Table K.2).

The main features of the site are summarised on the Site Features Plan presented in Appendix A (Hydrock Drawing 16153-HYD-XX-XX-ZZ-DR-GE-1003).

A summary of the Source-Pathway-Receptor (SPR) contaminant linkages for which the risks may be unacceptable and require mitigation (those that are moderate or higher) are discussed in Table 7.2.

Table 7.2: Residual risks following risk evaluation

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 1.	Pesticides in the Topsoil at TP64	Ingestion, inhalation or direct contact.	Human health.	Chemicals identified in the screen, no GACs available.	Further testing in location of TP64 to confirm presence and delineate extents (if required). Mitigation (if required) to be confirmed following further testing.
PL 2.	Potential ACM in crushed aggregate in the farm track	Inhalation or Ingestion	Human health	Further investigation required. See Sections 9 and 10.	Excavate and removal as hazardous waste to suitably licensed waste facility, possibly requiring licensed contractors.

8. WASTE AND MATERIALS MANAGEMENT

8.1 Introduction

The Waste Framework Directive (WFD) (2009/98/EC) defines waste as *'any substance which the holder discards or intends to discard.'* In a geo-environmental context, the waste is most often 'soil' and the two main scenarios are offsite disposal of the material as a waste and/or reuse of the material on site. For cost and sustainability reasons, reuse is preferred to off-site disposal.

Section 8.2 below describes the key issues relating to off-site disposal to landfill and Section 8.3 considers requirements relating to reuse of soils and materials management.

8.2 Waste disposal

8.2.1 Principles

Based on the WFD, any material excavated on site may be classified as waste and it is the responsibility of the producer of a material to determine whether or not it is waste. Where off-site disposal is undertaken, the following guidance applies.

Classification is a staged process:

- A hazardous waste is defined under the WFD as one which possesses one or more of fifteen defined hazardous properties. If a waste is not defined as hazardous, then it is non-hazardous.
- Where the materials are soil, it is then be assigned using the 'List of Waste Codes', which classifies the material as either:
 - hazardous (17-05-03), which is defined as *"soil and stones containing hazardous substances"*; or
 - non-hazardous (17-05-04), which is defined as *"soil and stones other than those mentioned in 17-05-03"*.
 - Hydrock utilise the proprietary assessment tool, HazWasteOnline™ to undertake this assessment.
- Waste Acceptance Criteria (WAC) testing is then undertaken if required, and are only applicable following classification of the waste, and only where the waste is destined for disposal to landfill. The WAC are both qualitative and quantitative. The WAC and the associated laboratory analyses (leaching tests) are not suitable for use in the determination of whether a waste is hazardous or non-hazardous.

It should be noted that some non-hazardous wastes may be suitable for disposal at an inert landfill as non-hazardous waste, subject to meeting the appropriate waste acceptance criteria.

It should be noted that classification must be undertaken on the waste produced, by the waste producer. Necessary sampling frequency to adequately characterise a soil population is defined within WM3.

Further discussion with regards to the characterisation process for different scenarios and waste types is provided below.

Topsoil

Topsoil is biodegradable, therefore if they are surplus to requirements and cannot be re-used in accordance with a Materials Management Plan, they cannot be classified as inert. As such, topsoil need to be classified by a staged assessment and sampling process and would either be classified as hazardous or non-hazardous, depending upon the results of the assessment.

Greenfield Sites

Waste from completely greenfield sites may be accepted at a landfill as inert waste if it meets the requirements of paragraph 10 (wastes acceptable without testing at landfills for inert waste) of the Landfill (England and Wales) (Amendment) Regulations (2005) ('the Regulations') can be met. Paragraph 10 of the Regulations states, "*soils may be able to be classified as inert waste without testing, if:*

- *they are single stream waste of a single waste type;*
- *there is no suspicion of contamination and they do not contain other material or substances such as metals, asbestos, plastics, chemicals, etc...."*

As such, where the site is greenfield and the waste producer is confident about the quality of a soil (i.e. naturally occurring and uncontaminated), further sampling and laboratory testing is not necessary for the Basic Characterisation and this can be undertaken on qualitative Waste Acceptance Criteria testing.

In this instance the waste producer can characterise the waste based on visual assessment and written description of the waste in addition to supporting evidence such as a desk study assessment of the greenfield status. However, it should be noted this characterisation is subject to agreement by the landfill operator who may require testing to be undertaken to confirm classification.

Contaminated or potentially contaminated sites

If the site is brownfield, contaminated or potentially contaminated, the waste must undergo an initial waste classification exercise using background information on the source and origin of the waste and assessment of chemical test data in accordance with Environment Agency Technical Guidance WM3.

If following the initial waste classification exercise, the soils are acceptable for disposal to a non-hazardous landfill, further qualitative Waste Acceptance Criteria (WAC) testing is not required.

However, if soils are potentially able to be disposed to an inert landfill as non-hazardous waste, or require testing to determine if they can be disposed of to a stable non-reactive hazardous or hazardous class of landfill, the next stage of assessment is to undertake qualitative WAC testing. This will determine the Basic Characterisation and the landfill category at which the soils can be accepted.

Hazardous material must be subjected to WAC testing to determine whether it requires treatment before it can be accepted at the hazardous landfill, while non-hazardous material can be tested to determine whether it may be suitable for placement in an inert landfill.

8.2.2 *HazWasteOnline™ assessment*

As the site is greenfield, HazWasteOnline™ assessment is not technically required. However, it has been undertaken for completeness during the site investigation. The output of the HazWasteOnline™ assessment is provided in Appendix G and a summary of the preliminary waste classification is provided below in Section 8.2.4.

8.2.3 *WAC Testing*

The qualitative WAC tests are provided in Appendix G and a summary of the preliminary disposal options are provided below in in Section 8.2.4.

8.2.4 *Preliminary waste disposal options*

The site is greenfield (as proven by the desk study assessment and a visual assessment of the soils). However, WAC testing and the HazWasteOnline™ assessment have been undertaken. As long as no unexpected contamination is encountered and if suitable segregation of different types of natural waste streams is put in place, for soils to be disposed of, it is considered that:

- The topsoil generally has a high organic content (as proven by the Loss on Ignition and Total Organic Carbon tests) and is likely to be classified as hazardous waste for disposal.
- The natural uncontaminated subsoils are likely to be classified as ‘inert’ waste and based on the WAC testing should be able to be disposed of at an ‘inert’ landfill.

8.2.5 *General waste comments*

It should be noted that:

- It is the waste producer’s responsibility to segregate the waste at source and waste producers must not mix waste materials/streams or dilute hazardous components, for example by mixing with less or non-hazardous waste on site to meet WAC limit values.
- The above preliminary assessment has been made on the basis of the soils tested as part of the ground investigation, using WAC testing and the HazWasteOnline™ assessment. However, the formal classification of waste can only be undertaken on the material to be disposed of, and by the waste producer and the receiving landfill as license conditions vary from landfill to landfill.
- Basic Characterisation should be undertaken in accordance with Environment Agency guidance by the waste producer. Hydrock can assist if required and this report will assist the characterisation. However, Basic Characterisation does not form part of the current commission and would require further assessment and testing on the wastes actually to be disposed.
- Once the waste producer has undertaken an initial Basic Characterisation on each waste stream, they can manage the soils as part of the on-site processing programme (for example, stockpiling, treatment, screening and separation). The waste producer and landfill operator will then need to agree the suite of compliance testing for regularly generated waste to demonstrate compliance with the initial Basic Characterisation prior to disposal.
- At the time of disposal, additional testing on the excavated soils to be disposed of, will likely be necessary.
- Non-hazardous and hazardous soils require pre-treatment (separation, sorting and screening) prior to disposal.

- The costs for disposal of non-hazardous and hazardous soils are significant compared to disposal of inert material.
- In addition to disposal costs, landfill tax will be applicable. Non-hazardous and hazardous waste will generally be subject to the Standard Rate Landfill Tax. Inert or inactive waste will generally be subject to the Lower Rate Landfill Tax. The landfill tax value changes each April and can be found at <https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013>.
- Before a waste producer can move waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following³:
 - Duty of care transfer note / Hazardous Waste consignment note, including comment as to if pre-treatment has been undertaken; and
 - Basic Characterisation of the waste, to include: description of the waste; waste code (using list of wastes); composition of the waste (by testing, if necessary) and; WAC testing (if required).

8.3 Materials management

8.3.1 Introduction

Soils that are to remain on site, should be managed and reused in accordance with a Materials Management Plan (MMP), prepared in accordance with 'The Definition of Waste: Development Industry Code of Practice', Version 2 (CL:AIRE), known as the DoWCoP. Where all aspects of the DoWCoP are followed the soils are considered not to be waste, because they were never discarded in the first place.

Version 2 of the DoWCoP clearly sets out the principles and an outline of the requirements of a MMP. The following compliance criteria must be seen to apply to the MMP for the site:

- Factor 1: Protection of human health and protection of the environment.
- Factor 2: Suitability for use, without further treatment.
- Factor 3: Certainty of Use.
- Factor 4: Fixed Quantity of Material.

The reuse of soils at sites should be considered during the planning and development design process so that compliance with issues such as fixed quantity and certainty of use clearly relate to agreed site levels. Suitability of Use is normally evident from the remediation strategy or the design statement, which form an integral part of a MMP. However, some soils may need to be tested post-excavation to prove they are suitable for use.

Once the MMP is finalised, it must be declared by a Qualified Person (QP). The Declaration is an on-line submission as part of which the QP is required to confirm that the declaration is being made before the relevant works have commenced (i.e. it is not a retrospective application).

Once all material movements have been completed in accordance with the MMP a verification report must be produced, kept for 2 years and provided to the EA on request.

³ ENVIRONMENT AGENCY. November 2010. Guidance on waste acceptance procedures and criteria. Waste acceptance at landfills. The Environment Agency.

It should be noted that failure to comply with the requirements of the DoWCoP when re-using materials has potentially significant consequences for the waste holder. The risk is that the reused materials are still regarded as a waste that has been illegally deposited. From 1 April 2018, the scope of Landfill Tax has been extended to sites operating without the appropriate environmental disposal permit, and operators of illegal waste sites will now be liable for Landfill Tax. Further information is available at: <https://www.gov.uk/government/publications/landfill-tax-disposals-not-made-at-landfill-sites/landfill-tax-disposals-not-made-at-landfill-sites>.

If soils are excavated and reused on sites (or moved to another site) without a MMP, exemption, or appropriate Permit in place, anyone who knowingly facilitates the disposal may be '*jointly and severally liable*' to any assessment of tax, fines or prosecution.

8.3.2 *Materials management scenarios*

The materials management scenarios present on site are discussed below.

It should be noted that more than one scenario may apply, dependent upon where the soils are proposed for reuse.

Clean, naturally occurring materials – reused on the site of origin

Where soils are naturally occurring, uncontaminated and are reused on the site they are excavated (i.e. greenfield site with documented site history, with no Made Ground), they will fall outside the Waste Framework Directive (WFD) (i.e. they will not be a waste when reused on the site of origin).

However, there needs to be certainty of that reuse, and evidence is necessary to support this strategy, for example through information provided during the planning process. The onus is on the developer to demonstrate that the materials are not a waste and will never become a waste. As such, a Materials Re-use Strategy is recommended to show certainty. Alternatively, if the volume of material is under 1,000 tonnes, then a U1 waste exemption may be applied for from the Environment Agency.

It may be noted that some 'clean naturally occurring materials' may still fail the 'suitable for use' test, for example, soils with a naturally high organic content may not be suitable for use because of their propensity to produce ground gases such as methane. Rules regarding other more unusual circumstances such as where natural soils contain an unacceptably high mineral content are described in the DoWCoP.

Clean, naturally occurring materials – transferred to other sites

Where soils are naturally occurring, uncontaminated and are transferred to other sites (i.e. direct transfer), they will not become waste as long as the transfer is undertaken in accordance with the DoWCoP. A MMP must be prepared for the receiving site and the materials movement must be noted in the MMP of the Donor site. This movement must have been declared to CL:AIRE prior to the works commencing.

Made Ground and other contaminated soils

On sites where Made Ground or contaminated soils are present, any soils excavated will be a waste as soon as they are excavated (even if they are clean, naturally occurring materials), unless they are subject to reuse in accordance with the DoWCoP. As such, for any brownfield site or a site where Made Ground is present and soils are being moved and reused, the materials could be deemed a waste, subject to either:

- a Materials Management Plan (MMP), to prevent the material being classified as a waste following reuse; or
- an exemption (for limited volumes); or
- an environmental permit, dependant on its status.

Other commonly occurring circumstances are:

If Made Ground is being moved between sites, it must be ensured that appropriate permits are in place to ensure the soils are not classified as a waste. Made Ground cannot be moved between sites under DoWCoP alone and would require relevant permits as part of the MMP documentation for the Hub site the material is being treated at.

Made Ground and other contaminated soils

All recycled materials (6F2 etc.) must be produced under the 2013 WRAP 'Quality Protocol: Aggregates from inert waste', whether on site or off-site. If they are not, they will be deemed a waste and can only be used on site under a permit. More information can be found at <https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-frm-inert-waste>.

Geotechnical improvement requirements

Construction activities carried out on uncontaminated soils solely for the purpose of improving geotechnical properties e.g. lime / cement modification, are not generally regarded as waste treatment operations and do not require a permit.

However, should processing be needed (such as screening, treatment or improvement), that would constitute a waste activity and require a mobile treatment permit. This may be as simple as removing oversize material with an excavator bucket, to using a riddle bucket to remove hardcore to full mechanical screening.

9. UNCERTAINTIES AND LIMITATIONS

9.1 Site-specific comments

The gas monitoring undertaken to date and included in this report is insufficient to fully characterise the site in accordance with CIRIA Report C665. Monitoring is ongoing and the conclusions of this report will be updated following completion of the scheduled monitoring.

Investigation and sampling of the materials in the farm access track could not be undertaken as the track was required to be kept in use as access to the farm to the north of the site.

9.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Countryside Properties PLC (the Client), by e-mail dated 28th October 2020 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in November 2020. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Hydrock has used reasonable skill, care and diligence in the design of the investigation of the site and in its interpretation of the information obtained. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Groundwater data are only representative of the dates on which they were obtained and both levels and quality may vary.

Plans that provide assessment of foundation types and depths are indicative and subject to further design. This design should incorporate a detailed assessment of the influence of trees, influence of cut to fill proposals and geological conditions.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where the existing report(s) prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. The various methodologies used are referenced in Appendix J. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The chemical analyses reported were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional analysis will be required at the time of disposal to fully classify waste. Discussion and comment with regards to waste classification are preliminary and do not form the requirements of 'Basic Characterisation' as required.

Assessment and testing for the presence of coal tar has only been completed at the locations of exploratory holes undertaken for risk assessment purposes. This investigation is not designed to provide a definitive assessment of the risk from coal tar, nor the waste classification for bituminous bound pavement arisings at the site.

Unless otherwise stated, at the time of this investigation the future routes of water supply pipes had not been established. This investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling and chemical testing may be required at a later date once the routes of the supply pipes are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

Whilst the preliminary risk assessment process has identified potential risks to construction workers, consideration of occupational health and safety issues is beyond the scope of this report.

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

10. RECOMMENDATIONS FOR FURTHER WORK

Following the ground investigation works undertaken to date, the following further works will be required:

- completion and reporting of the ongoing gas monitoring, hence the conclusions in this report are provisional, subject to the completion of monitoring;
- supplementary sampling and laboratory testing to confirm the presence of pesticides in the topsoil at and around TP64 and, if required, delineate their vertical and horizontal extents.
- Supplementary investigation, sampling and testing of the materials in the farm track for the potential presence of ACM.
- assessment of tree influence on foundations and design of foundations, for which an updated arboricultural tree survey will be required; and
- production of a Materials Management Plan relating to reuse of soils, disposal of excess soils (if required) and import of soils to the site.

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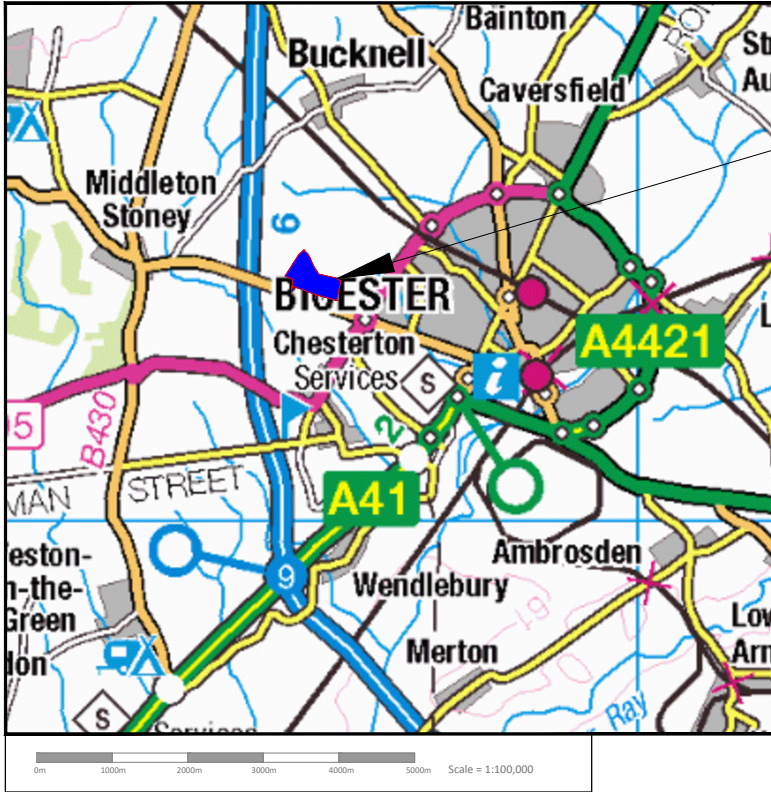
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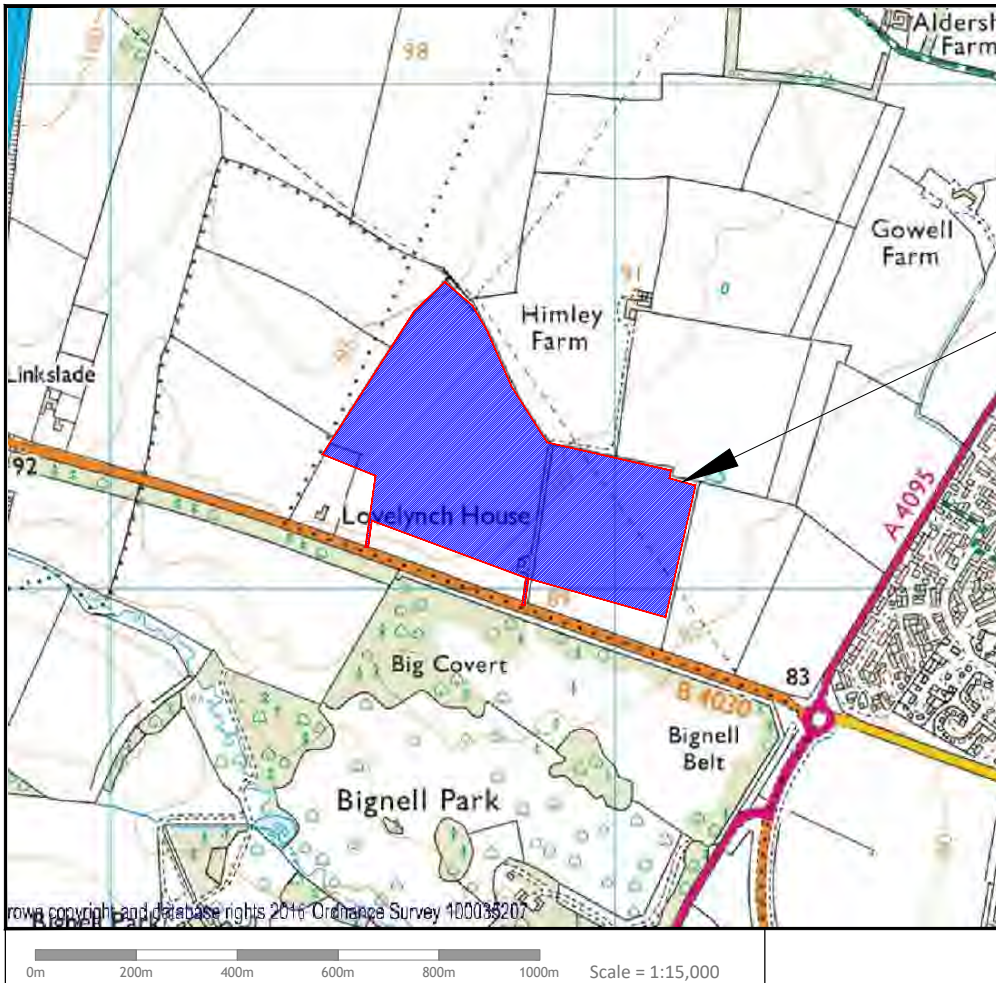
Appendix A

Drawings

OS NORTH



THE SITE



THE SITE

FIRST ISSUE						
P01	SD	08/12/20	CA	08/12/20	JC	08/12/20
REVISION NOTES/COMMENTS						
REV.	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
 <small>Hawthorn Park Holdenby Road Sparton Northampton NN6 8LD TEL: 01604 842 888 E-Mail: northampton@hydrock.com or visit www.hydrock.com</small>						
CLIENT						
Countryside Properties Ltd						
PROJECT						
Himley Village, Bicester						
TITLE						
SITE LOCATION PLAN						
HYDROCK PROJECT NO. C-16153-C			SCALE @ A4 See Drawing			
PURPOSE OF ISSUE SUITABLE FOR INFORMATION					STATUS S2	
DRAWING NO. (PROJECT - ORIGINATOR VOLUME LEVEL-TYPE-ROLE-NUMBER) 16153-HYD-XX-ZZ-DR-GE-1000					REVISION P01	

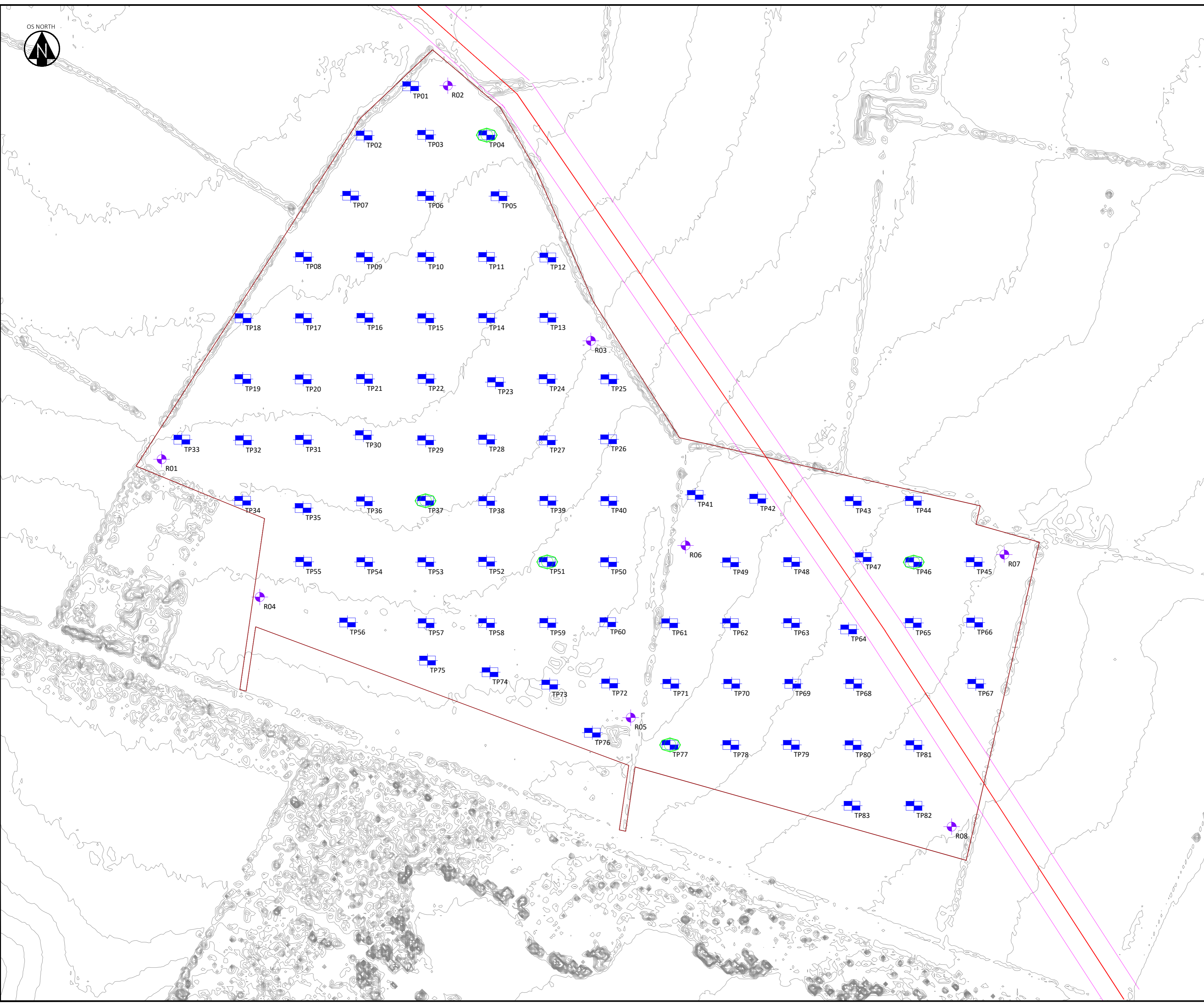


KEY

- Approximate Site Boundary
- Overhead utilities 15m stand off zone (location approximate)
- + Rotary Borehole
- + Trial Pit
- Soakaway location

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
3. This drawing has been based on the following drawings and information: Open Source Lidar data: Contains public sector information under the Open Government License v3.0.



PO1	FIRST ISSUE					
	SD	20/01/21	CA	20/01/21	JC	20/01/21

REV.	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
Countryside Properties Ltd

PROJECT
Himley Village, Bicester

TITLE
Exploratory Hole Location Plan

HYDROCK PROJECT NO. C-16153-C	SCALE @ A2 1:2000
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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
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DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 16153-HYD-XX-ZZ-DR-GE-1001	REVISION P01
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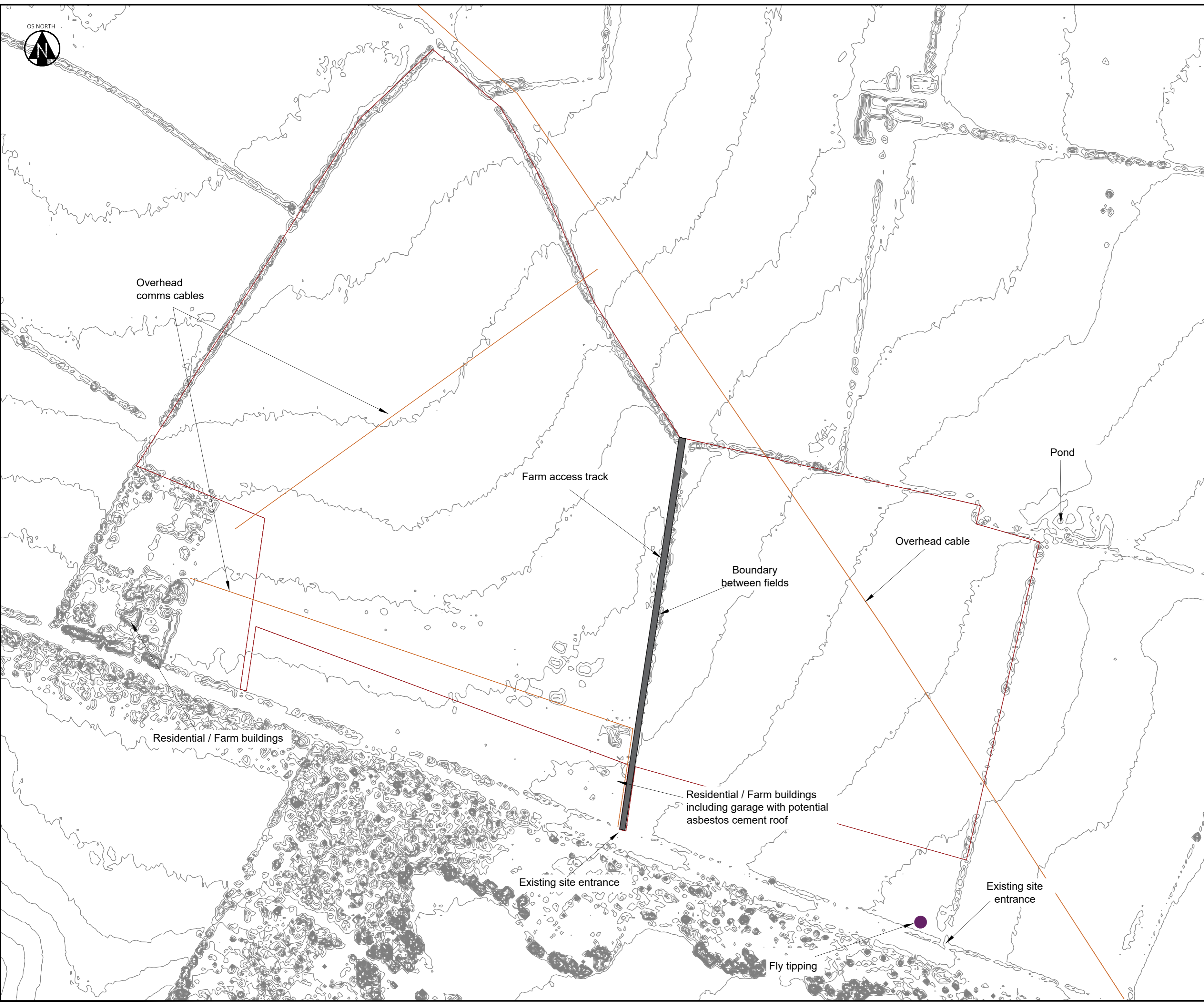


KEY

- Approximate Site Boundary
- Overhead utilities (location approximate)
- Approximate area of fly tipping

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
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ADDITIONAL DETAILS ADDED					
SD	20/01/21	CA	20/01/21	JC	20/01/21
FIRST ISSUE					
CA	09/12/20	JC	09/12/20	JC	09/12/20
REVISION NOTES/COMMENTS					
DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
Countryside Properties Ltd

PROJECT
Himley Village, Bicester

TITLE
Site Features Plan

HYDROCK PROJECT NO.
C-16153-C

SCALE @ A2
1:2000

PURPOSE OF ISSUE
SUITABLE FOR INFORMATION



STATUS
S2

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
16153-HYD-XX-ZK-SK-GE-1002

REVISION
P02



KEY

	Approximate Site Boundary
	Overhead utilities (location approximate)

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
3. This drawing has been based on the following drawings and information:
Open Source Lidar data: Contains public sector information under the Open Government License v3.0.

Field 1

Field 2

ADDITIONAL DETAILS ADDED						
P02	SD	20/01/21	CA	20/01/21	JC	20/01/21
FIRST ISSUE						
P01	CA	09/12/20	JC	09/12/20	JC	09/12/20
REVISION NOTES/COMMENTS						
REV.	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
Countryside Properties Ltd

PROJECT
Himley Village, Bicester

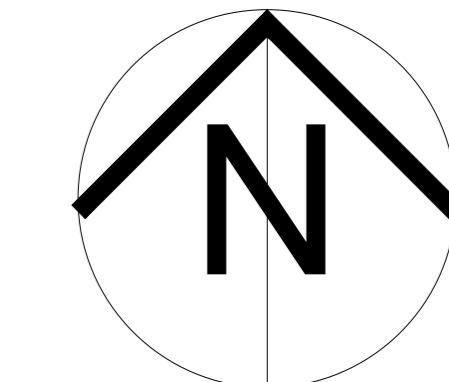
TITLE
Site Zonation Plan

HYDROCK PROJECT NO. C-16153-C	SCALE @ A2 1:2000
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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 16153-HYD-XX-ZZ-SK-GE-1003	REVISION P01

HIMLEY VILLAGE, BICESTER

Proposed

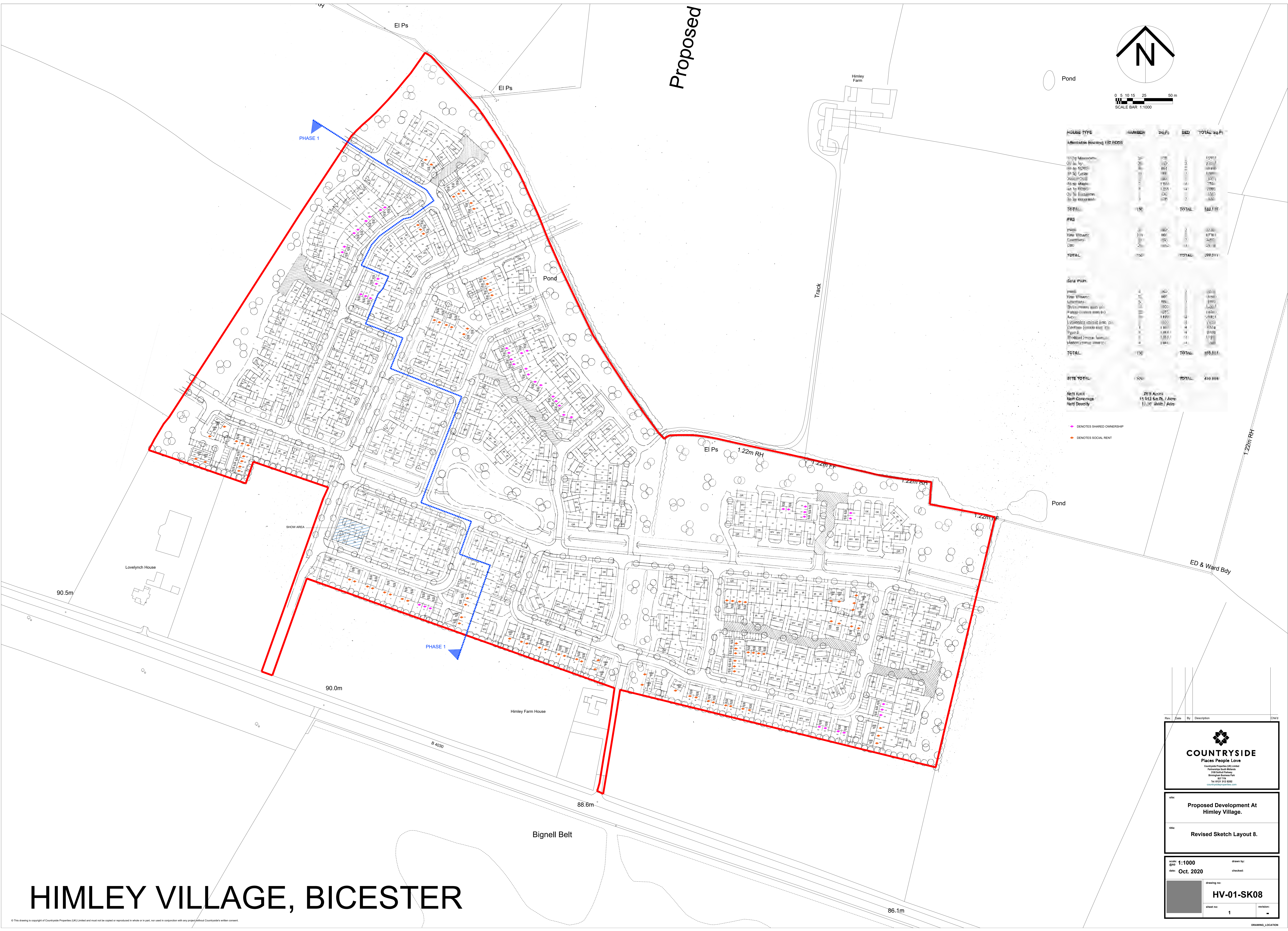


0 5 10 15 25 50 m
SCALE BAR 1:1000

HOUSE TYPE	NUMBER	SQ.Ft	BED	TOTAL sq.Ft
APPROXIMATE HOUSING VOLUME				
1/200 Masonry	20	2000	10	10000
3/400 Masonry	20	6000	10	20000
5/500 Masonry	10	15000	5	75000
7/700 Masonry	10	21000	5	105000
9/900 Masonry	10	27000	5	135000
11/1100 Masonry	10	33000	5	165000
13/1300 Masonry	10	39000	5	195000
15/1500 Masonry	10	45000	5	225000
17/1700 Masonry	10	51000	5	255000
19/1900 Masonry	10	57000	5	285000
TOTAL	130	300000	65	1500000
PRE				
1/200 Masonry	5	1000	2	5000
3/400 Masonry	5	3000	2	15000
5/500 Masonry	5	7500	2	37500
7/700 Masonry	5	10500	2	52500
9/900 Masonry	5	13500	2	67500
11/1100 Masonry	5	16500	2	82500
13/1300 Masonry	5	19500	2	97500
15/1500 Masonry	5	22500	2	112500
17/1700 Masonry	5	25500	2	127500
19/1900 Masonry	5	28500	2	142500
TOTAL	50	150000	26	750000
NEW PLAN				
1/200 Masonry	4	800	2	4000
3/400 Masonry	4	2400	2	12000
5/500 Masonry	4	6000	2	30000
7/700 Masonry	4	8400	2	42000
9/900 Masonry	4	10800	2	54000
11/1100 Masonry	4	13200	2	66000
13/1300 Masonry	4	15600	2	78000
15/1500 Masonry	4	18000	2	90000
17/1700 Masonry	4	20400	2	102000
19/1900 Masonry	4	22800	2	114000
TOTAL	40	160000	22	800000
SITE TOTAL	130	460000	87	2250000
Nett Area	20.5 Acres			
Nett Coverage	15.143 Acres			
Nett Density	1.100 Units/Acre			

◆ DENOTES SHARED OWNERSHIP
◆ DENOTES SOCIAL RENT

Rev	Date	By	Description	CHKD
 COUNTRYSIDE Places People Love Countryside Properties (UK) Limited Park Road, Bicester, Oxfordshire, OX9 3JQ 01295 434343 countryside.co.uk				
Proposed Development At Himley Village.				
Revised Sketch Layout 8.				
Scale	1:1000	Drawn by:		
Date	Oct. 2020	Checked:		
Drawing no:	HV-01-SK08			
Sheet no:	1	Revision:		



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Appendix B

Field Reconnaissance Photographs

<p>Desk Study Photograph 1</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Looking south from the southern boundary of the western field.</p>	
<p>Description: Site entrance and farm track.</p>	

<p>Desk Study Photograph 2</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Looking south west from south of western field</p>	
<p>Description: Adjacent farm property immediately west of the site entrance and farm track.</p>	

<p>Desk Study Photograph 3</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: North west from southern east of western field.</p>	
<p>Description: Garage with a probable asbestos cement roof. Located off site, immediately west.</p>	


<p>Desk Study Photograph 4</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Facing north from south east end of the western field.</p>	
<p>Description: Farm track and hedgerow of western field trending north south.</p>	

<p>Desk Study Photograph 5</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: North west from south east of western field.</p>	
<p>Description: Agricultural field forming the western field.</p>	

<p>Desk Study Photograph 6</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Looking east from south western end of the western field.</p>	
<p>Description: Overhead cables in the south of the western field trending east to west.</p>	

<p>Desk Study Photograph 7</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Facing north from the south west end of the western field.</p>	
<p>Description: Overhead service trending south west to north east.</p>	

<p>Desk Study Photograph 8</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: North from the south east of the eastern field.</p>	
<p>Description: Area of standing surface water in the south east of the eastern field and the site entrance.</p>	

<p>Desk Study Photograph 9</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: North west from the south east of the eastern field.</p>	
<p>Description: Agricultural field forming the eastern field of the site.</p>	

<p>Desk Study Photograph 10</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Facing south east from the south east corner of the eastern field.</p>	
<p>Description: Site entrance into the eastern field.</p>	

<p>Desk Study Photograph 11</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: East from the south east corner.</p>	
<p>Description: Land immediately east of the site with the quarrying / earthworks.</p>	

<p>Desk Study Photograph 12</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: Facing north from the south east of the eastern field.</p>	
<p>Description: Agricultural field and overhead services trending north west to south east.</p>	

<p>Desk Study Photograph 13</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: n/a.</p>	
<p>Description: Area of fly tipping adjacent to the eastern fields entrance.</p>	

<p>Desk Study Photograph 14</p>	
<p>Date: 03/11/20</p>	
<p>Direction Photograph Taken: South from the north eastern end of the eastern field.</p>	
<p>Description: Agricultural field hedgerow/tree eastern boundary.</p>	

Appendix C

Exploratory Hole Location Plan, Exploratory Hole Logs and Photographs

Exploratory Hole Location Plan

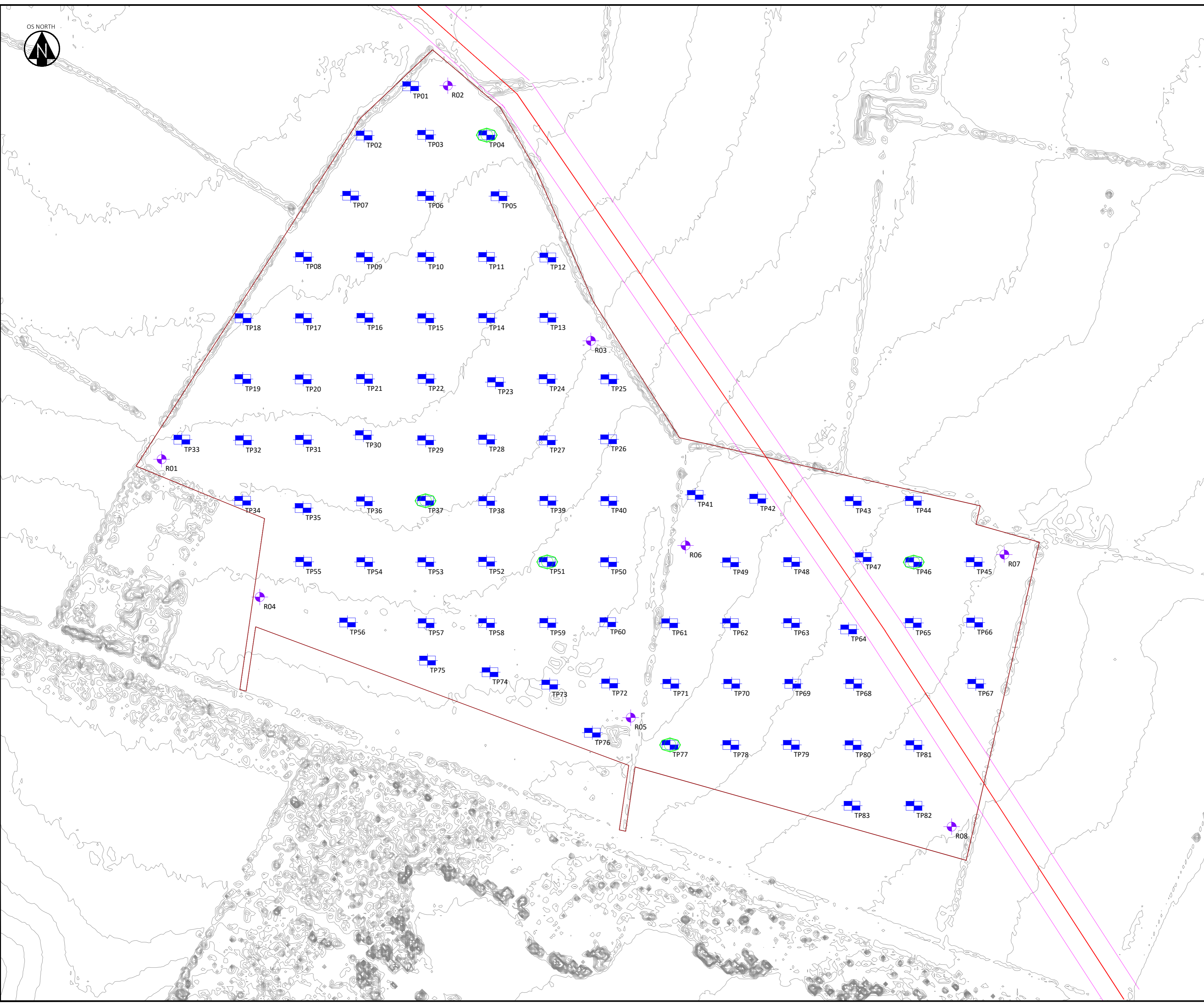


KEY

- Approximate Site Boundary
- / Overhead utilities 15m stand off zone (location approximate)
- + Rotary Borehole
- + Trial Pit
- Soakaway location

NOTES

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PO1	FIRST ISSUE					
	SD	20/01/21	CA	20/01/21	JC	20/01/21

REV.	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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or visit www.hydrock.com

CLIENT
Countryside Properties Ltd

PROJECT
Himley Village, Bicester

TITLE
Exploratory Hole Location Plan

HYDROCK PROJECT NO. C-16153-C	SCALE @ A2 1:2000
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PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2
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DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) 16153-HYD-XX-ZZ-DR-GE-1001	REVISION P01
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Exploratory Hole Logs



Method: Rotary Open	Date(s): 17/11/2020	Logged By: TB	Drilled By: ADP
Client: Countryside Properties	Co-ords: 455799.33, 223368.34	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 91.99m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	Instrum- entation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
1.50	SPT	N=35 (2,10,16,9,5,5)						Firm dark brown gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (TOPSOIL) Orangish brown LIMESTONE. (CORNBRAsh FORMATION) Grey CLAY. (CORNBRAsh FORMATION) Grey CLAY with limestone cobbles. (CORNBRAsh FORMATION) Grey LIMESTONE interbedded with CLAY. (FOREST MARBLE FORMATION)	0.50	(0.50)	91.49		
3.00	SPT	50/275mm (2,2,5,6,15,24)							1.20	(0.70)	90.79		
									1.50	(0.30)	90.49		
									2.00	(0.50)	89.99		
5.00	SPT	50/130mm (8,16,17,33)							3.00	(3.00)			
									5.00		86.99		
								End of Borehole at 5.00m					

Progress and Observations

General Remarks:

1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using rotary open hole drilling. 4. Geological descriptions are based on the limited returned arisings from open hole drilling. 5. Gas and groundwater monitoring pipe installed to 5.00m (2.00m to 5.00m response zone) topped with a monitoring cover on completion.

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
205	17/11	1200	5.00	3.00	130		Water	Grey



Method: Dynamic Sampled & Rotary Cored	Date(s): 19/11/2020	Logged By: MA	Drilled By: ADP
Client: Countryside Properties	Co-ords: 455528.00, 223158.27	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 90.71m OD		Scale: 1:50

Sample/Core Run (m) Smpl. Ø (mm) Smpl. rec. %	Samples / Tests			Mechanical Log				Water-Strikes	Stratum Description	Depth (m)	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	Min If. Mean Max							
0.00 - 1.00 117mm 100% rec									Firm dark brown gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (TOPSOIL)	0.30	(0.30)	90.41		
1.00 - 1.70									Stiff orange brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse limestone. (CORNBRASSH FORMATION)	1.20	(0.90)	89.51		
1.70 - 3.00	1.50	SPT	50/75mm (20,5,50)	78	42	0	19		Medium strong greyish brown calcareous LIMESTONE. Fractured are very closely spaced horizontal open smooth and clean. (CORNBRASSH FORMATION)	2.10	(0.90)	88.61		
3.00 - 4.50	3.00	SPT	N=13 (7,3,2,3,4,4)	85	68	68	NI		Firm grey brown very finely laminated slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine limestone. (FOREST MARBLE FORMATION) Very stiff dark grey CLAY. (FOREST MARBLE FORMATION) ... Between 2.30m and 2.50m: Friable	2.30	(0.20)	88.41		
4.50 - 5.00	5.00	SPT	50/150mm (10,12,30,20)	93	76	76	4		Medium strong grey calcareous LIMESTONE. Fractures are sub-vertical open undulating smooth. (FOREST MARBLE FORMATION) ... Between 3.00m and 3.10m: Friable with occasional gravels of sub-rounded mudstone.	3.95	(1.25)	86.76		
				100	80	80			Very stiff dark grey CLAY. (FOREST MARBLE FORMATION)	4.40	(0.45)	86.31		
									Very stiff friable light grey slightly gravelly silty CLAY. Gravel is sub-angular to sub-rounded fine to coarse mudstone. (FOREST MARBLE FORMATION)	5.00	(0.60)	85.71		
End of Borehole at 5.00m														

Progress and Observations

General Remarks:

1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using rotary coring. 4. Gas and groundwater monitoring pipe installed to 3.50m (1.50m to 3.50m response zone) topped with a monitoring cover on completion.

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
205	19/11	1200	5.00	1.50	130		Water	Grey



Method: Rotary Open	Date(s): 19/11/2020	Logged By: TB	Drilled By: ADP
Client: Countryside Properties	Co-ords: 455832.02, 223059.40	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 89.47m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	Instrum- entation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
1.50	SPT	N=29 (2,4,6,6,8,9)						Firm dark brown gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (TOPSOIL) Concrete. (MADE GROUND) Orangish brown limestone GRAVEL. (HEAD DEPOSITS) Yellowish brown slightly sandy slightly gravelly CLAY. (FOREST MARBLE FORMATION) Grey sandy CLAY. (FOREST MARBLE FORMATION)	0.20 0.30	(0.20) (0.30)	89.27 89.17		
3.50	SPT	50/80mm (5,20,44,6)						LIMESTONE. (FOREST MARBLE FORMATION)	1.50 2.00	(1.20) (0.50)	87.97 87.47		
5.00	SPT	50/55mm (25,50)						End of Borehole at 5.00m	3.50 5.00	(1.50)	85.97 84.47		

Progress and Observations

General Remarks:

1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using rotary open hole drilling. 4. Geological descriptions are based on the limited returned arisings from open hole drilling. 5. Gas and groundwater monitoring pipe installed to 5.00m (3.50m to 5.00m response zone) topped with a monitoring cover on completion.

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
205	19/11	1630	5.00	1.50	130		Water	Grey



Method: Rotary Open	Date(s): 20/11/2020	Logged By: TB	Drilled By: ADP
Client: Countryside Properties	Co-ords: 455877.02, 223200.57	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 89.70m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	Instrum- entation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
1.50	SPT	50/100mm (5,7,7,43)						Firm dark brown gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (TOPSOIL) Orangish brown LIMESTONE interbedded with CLAY. (CORNBASH FORMATION)	0.50	(0.50)	89.20		
3.00	SPT	N=36 (3,2,7,12,8,9)						Grey CLAY. (FOREST MARBLE FORMATION)	1.60	(2.40)	88.10		
5.00	SPT	50/225mm (7,9,10,12,28)						LIMESTONE. (FOREST MARBLE FORMATION)	4.00	(1.00)	85.70		
End of Borehole at 5.00m									5.00		84.70		
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Progress and Observations

General Remarks:

1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using rotary open hole drilling. 4. Geological descriptions are based on the limited returned arisings from open hole drilling. 5. Gas and groundwater monitoring pipe installed to 5.00m (3.00m to 5.00m response zone) topped with a monitoring cover on completion.

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
205	20/11	1230	5.00	3.00	130		Water	Grey



Method: Dynamic Sampled & Rotary Cored	Date(s): 23/11/2020	Logged By: MA	Drilled By: ADP
Client: Countryside Properties	Co-ords: 456138.28, 223193.13	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 86.86m OD		Scale: 1:50

Sample/Core Run (m) Smpl. Ø (mm) Smpl. rec. %	Samples / Tests			Mechanical Log				Water-Strikes	Stratum Description	Depth (m)	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	Min If. Mean Max							
0.00 - 1.50 117mm 100% rec									Stiff light yellowish brown organic slightly sandy gravelly CLAY with a high cobble content. Gravel is angular to sub-rounded fine to coarse limestone. Cobbles are sub-rounded calcareous limestone. (TOPSOIL)	0.43	(0.43)	86.43		
1.50 - 2.70 117mm 100% rec	1.50	SPT	N=34 (5,4,7,12,7,8)						Weak orange brown calcareous LIMESTONE (Non-intact). (CORNBURASH FORMATION) ... Between 0.75m and 0.85m: Dark brown clay band ... Between 1.20m and 1.25m: Dark brown clay band	1.80	(1.37)	85.06		
2.70 - 4.20	2.70	SPT	N=33 (4,6,6,9,9,9)						Stiff greyish brown slightly sandy gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (FOREST MARBLE FORMATION)	2.70	(0.90)	84.16		
	2.70 - 2.90	C					NI		Weak orange brown calcareous LIMESTONE (Non-intact). (FOREST MARBLE FORMATION)	3.25	(0.55)	83.61		
				100	43	23	13		Medium strong grey calcareous LIMESTONE with occasional shell fragments. Fractures are closely spaced horizontal open undulating smooth. (FOREST MARBLE FORMATION)	3.65	(0.40)	83.21		
4.20 - 5.20	4.20	SPT	50/75mm (25,50)						Medium strong dark grey calcareous LIMESTONE with abundant shell fragments. Fractures are close sub-horizontal to sub-vertical open smooth. (FOREST MARBLE FORMATION)	4.20	(0.55)	82.66		
	4.40 - 4.60	C					10		Medium strong grey calcareous LIMESTONE with occasional shell fragments. Fractures are closely spaced horizontal open stepped smooth. (FOREST MARBLE FORMATION)	4.60	(0.40)	82.26		
	4.70 - 5.00	C		90	68	40			Strong dark grey calcareous LIMESTONE with abundant shell fragments. Fractures are close horizontal open smooth. (FOREST MARBLE FORMATION)	4.70	(0.10)	82.16		
							3		Very stiff greenish grey slightly sandy CLAY. (FOREST MARBLE FORMATION)	5.00	(0.30)	81.86		
									Weak greenish grey silty MUDSTONE. Fractures are horizontal to sub-horizontal closed smooth. (FOREST MARBLE FORMATION)	5.20	(0.20)	81.66		
									End of Borehole at 5.20m	6				

Progress and Observations									General Remarks:
Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)	
205	23/11	1700	5.20	2.70	130		Water	Grey	1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using dynamic sampling to 2.70m then rotary coring to 5.20m. 4. Gas and groundwater monitoring pipe installed to 3.50m (1.50m to 3.50m response zone) topped with a monitoring cover on completion.



Method: Rotary Open	Date(s): 24/11/2020	Logged By: TB	Drilled By: ADP
Client: Countryside Properties	Co-ords: 456095.09, 222969.99	Checked By: CA	Flush: Water
Hydrock Project No: C-16153	Ground Level: 86.04m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	Instrum- entation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
1.50	SPT	N=42 (3,3,4,7,14,17)						Firm dark brown gravelly CLAY. Gravel is angular to sub-rounded fine to coarse limestone. (TOPSOIL)	0.50	(0.50)	85.54		
								Orange brown gravelly CLAY. (CORNBRAH FORMATION) CLAY interbedded with LIMESTONE. (FOREST MARBLE FORMATION)	1.00	(0.50)	85.04		
3.00	SPT	50/45mm (25,50)								(3.50)			
5.00	SPT	N=28 (3,5,6,6,8,8)						LIMESTONE. (FOREST MARBLE FORMATION)	4.50		81.54		
									5.20	(0.70)	80.84		
End of Borehole at 5.20m													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Progress and Observations									General Remarks:
Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)	
205	24/11	1400	5.20	0.70	130		Water	Grey	1. Hand dug starter pit to 1.20m to check for services. 2. Groundwater not encountered, however any groundwater entries may have been masked by the water flush. 3. Borehole advanced using rotary open hole drilling. 4. Geological descriptions are based on the limited returned arisings from open hole drilling. 5. Gas and groundwater monitoring pipe installed to 3.00m (1.00m to 3.00m response zone) topped with a monitoring cover on completion.

Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455651.64, 223577.06	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 94.86m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft reddish brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	94.56	
0.50	D			Firm light brown (cream) and orangey brown slightly gravelly sandy CLAY with low cobble content . Gravel is angular to sub angular fine to coarse of limestone . Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.90	(0.60)	93.96	
1.00 - 1.50	B			Soft to firm light grey and light brown (cream) slightly gravelly sandy CLAY with medium cobble and low boulder content. Gravel is angular to sub angular fine to coarse of limestone with medium cobble content. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	1.80	(0.90)	93.06	
1.90	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBRAH FORMATION)	1.90	(0.10)	92.96	
				Weak light brown and light grey LIMESTONE (recovered as clayey sandy angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	2.20	(0.30)	92.66	
				Base of Excavation at 2.20m				
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 2.20m, rising to 2.10m. Flow rate slow. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455663.91, 223537.30	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 94.42m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.40	(0.40)	94.02	
0.50	D			Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL and COBBLES). (CORNBASH FORMATION)	0.80	(0.40)	93.62	
0.90	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.50	(0.70)	92.92	
1.50 - 2.00	B			Very weak light grey and light brown LIMESTONE (recovered as slightly clayey very sandy GRAVEL). (CORNBASH FORMATION)	2.30	(0.80)	92.12	
2.50	D		▼	Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.60	(0.30)	91.82	
				Base of Excavation at 2.60m				
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 2.50m, flow rate slow. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455714.04, 223536.99	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 94.16m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.86	
				Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with high cobble content . Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	1.00	(0.70)	93.16	
				Firm to stiff light brown mottled light grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.60	(0.60)	92.56	
				----- Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Soil infiltration test carried out in trial pit, results reported seperately. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455724.11, 223486.98	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 93.63m OD	Plant: 13T360	0.60m <input type="text"/>

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.33	
0.60	D			Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with high cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS)	1.00	(0.70)	92.63	
1.70	D			Firm to stiff light brown mottled light grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	2.80	(1.80)	90.83	
2.80 - 3.50	B			Stiff fissured bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.50	(0.70)	90.13	
				Base of Excavation at 3.50m				
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455663.97, 223487.16	Stability: No collapse	Dimensions: 2.50m 0.60m
Hydrock Project No: C-16153	Ground Level: 94.07m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	
Depth (m)	Type	Results							
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.77		
				Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL and COBBLES). (CORNBASH FORMATION)	0.90	(0.60)	93.17		
1.00	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.10	(0.20)	92.97		
				Very weak light grey and light brown LIMESTONE (recovered as slightly clayey very sandy GRAVEL). (CORNBASH FORMATION)	1.30	(0.20)	92.77		
1.40	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.00	(0.70)	92.07		
2.40 - 2.90	B		▼	Very weak grey fine grained SANDSTONE (recovered as sub angular fine to coarse GRAVEL with high cobble content). (CORNBASH FORMATION)	3.00	(1.00)	91.07		
3.00	D			Base of Excavation at 3.00m					

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 2.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455602.43, 223487.36	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 94.29m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.99	
0.60	D			Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL and COBBLES). (CORNBASH FORMATION)	0.80	(0.50)	93.49	
1.00	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.10	(0.30)	93.19	
1.20	D			Very weak light grey and light brown LIMESTONE (recovered as slightly clayey very sandy GRAVEL). (CORNBASH FORMATION)	2.10	(1.00)	92.19	
2.20	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy silty CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.20	(0.10)	92.09	
				Very weak light grey and light brown LIMESTONE (recovered as GRAVEL and COBBLES). (CORNBASH FORMATION)	2.30	(0.10)	91.99	
				Base of Excavation at 2.30m				
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.80, 223437.15	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 94.04m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	93.84	
				Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL with medium cobble content). (CORNBASH FORMATION)	0.50	(0.30)	93.54	
0.60	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.20	(0.70)	92.84	
				Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble content). (CORNBASH FORMATION)	1.50	(0.30)	92.54	
				----- Base of Excavation at 1.50m				
2								
3								
4								
5								

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455613.74, 223436.98	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 94.01m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.40	(0.40)	93.61	
0.50	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.00	(0.60)	93.01	
1.10	D		▼	Very weak orangish brown LIMESTONE (recovered as very sandy angular to sub angular fine to coarse GRAVEL). (CORNBASH FORMATION)	1.90	(0.90)	92.11	
Base of Excavation at 1.90m					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 2.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455664.09, 223437.07	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 93.77m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	B			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.47	
0.40	ES			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.00	(0.70)	92.77	
1.10	D		▼	Very weak orangish brown LIMESTONE (recovered as clayey very sandy angular to sub angular fine to coarse GRAVEL and COBBLES). (CORNBASH FORMATION)	1.60	(0.60)	92.17	
1.70	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.50	(0.90)	91.27	
2.60	D			Firm to stiff orangish brown and light grey slightly gravelly sandy CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	2.90	(0.40)	90.87	
3.00	D			Stiff bluish grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (FOREST MARBLE FORMATION)	3.50	(0.60)	90.27	
				----- Base of Excavation at 3.50m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.10m, flow rate fast. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455764.16, 223436.71	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.76m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	92.46	
0.50	D			Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with high cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS)	1.00	(0.70)	91.76	
1.30	D			Firm to stiff light brown mottled light grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAH FORMATION)	2.20	(1.20)	90.56	
2.30	D			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.20	(1.00)	89.56	
3.30	D			Stiff fissured bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.50	(0.30)	89.26	
				Base of Excavation at 3.50m	3.50		89.26	
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455714.03, 223387.05	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.98m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	92.68	
0.50	D			Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS) Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with high cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.40 0.80	(0.10) (0.40)	92.58 92.18	
1.50	D		▼	Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS) Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	1.40 1.60	(0.20)	91.58 91.38	
2.00	D			Firm to stiff light brown mottled light grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAH FORMATION)	1.90	(0.30)	91.08	
2.60 - 3.40	B			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION) Stiff fissured bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.60 3.40	(0.70) (0.80)	90.38 89.58	
				Weak light grey SANDSTONE (recovered as sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION) Base of Excavation at 3.50m	3.50	(0.10)	89.48	
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.40m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455664.02, 223386.92	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 93.31m OD	Plant: 13T360	0.60m <input type="text"/>

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.01	
0.50	ES			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	0.80	(0.50)	92.51	
1.20	D		▼	Very weak light grey and light brown LIMESTONE (recovered as slightly clayey very sandy GRAVEL). (CORNBASH FORMATION)	1.60	(0.80)	91.71	
1.70	D			Firm to stiff, thinly laminated orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.60	(1.00)	90.71	
2.00 - 2.60	B							
2.70	D			Stiff grey gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (FOREST MARBLE FORMATION)	3.30	(0.70)	90.01	
3.50	D			Weak light grey fine grained SANDSTONE (recovered as clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	3.50	(0.20)	89.81	
				Base of Excavation at 3.50m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455614.08, 223387.21	Stability: No collapse	Dimensions: 2.50m 0.60m
Hydrock Project No: C-16153	Ground Level: 93.62m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	93.32	
0.40	D			Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL and COBBLES). (CORNBASH FORMATION)	0.50	(0.20)	93.12	
0.60	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.10	(0.60)	92.52	
1.20	D		▼	Weak light grey and light brown LIMESTONE (recovered as slightly clayey very sandy GRAVEL). (CORNBASH FORMATION)	1.80	(0.70)	91.82	
----- Base of Excavation at 1.80m					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.78, 223386.88	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 93.75m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.40	(0.40)	93.35	
0.50	D			Stiff orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (CORNBASH FORMATION)	0.90	(0.50)	92.85	
1.00 - 1.40	B		▼	Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	1.40	(0.50)	92.35	
				Base of Excavation at 1.40m				
				2				
				3				
				4				
				5				

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455514.26, 223386.90	Stability: No collapse	Dimensions: 2.50m 0.60m
Hydrock Project No: C-16153	Ground Level: 93.93m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	93.73	
				Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	0.60	(0.40)	93.33	
0.80	D			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)	1.00	(0.40)	92.93	
1.30	D			Very weak light grey LIMESTONE (recovered as light grey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.50	(0.50)	92.43	
				----- Base of Excavation at 1.50m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455514.06, 223337.04	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 93.27m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	93.02	
0.50	D			Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION) Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	0.40	(0.15)	92.87	
1.30	D		▼	Very weak light grey and light brown LIMESTONE (recovered as sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.20	(0.80)	92.07	
----- Base of Excavation at 1.60m -----					1.60	(0.40)	91.67	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.20m, flow rate fast. 3. Trial pit backfilled with arisings on completion.


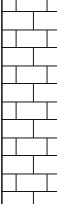
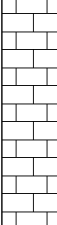


Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.53, 223336.78	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 93.26m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m(bgl)	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	93.01	
0.50	D			Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	0.60	(0.35)	92.66	
0.70	D			Stiff orangish brown mottled grey gravelly CLAY with a medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	0.80	(0.20)	92.46	
1.60	D		▼	Very weak light grey and light brown LIMESTONE (recovered as sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.60	(0.80)	91.66	
				----- Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate fast. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455613.82, 223337.16	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 93.25m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.40	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	92.95	
1.00 - 1.50	B			Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	1.00	(0.70)	92.25	
1.80	D		▼	Very weak light grey and light brown LIMESTONE (recovered as sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.80	(0.80)	91.45	
				----- Base of Excavation at 1.80m	2			
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.10m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455664.20, 223337.21	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 93.11m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	92.91	
				Very weak orangish brown LIMESTONE (recovered as angular to sub angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)		(0.30)	92.61	
0.60	D			Firm light grey and light orangish brown slightly gravelly sandy CLAY. Gravel is angular to sub angular fine to coarse of limestone (CORNBASH FORMATION)		(0.50)		
1.00 - 1.50	B			Firm to stiff orangish brown, brown and grey mottled sandy slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone and limestone lithorelicts. (CORNBASH FORMATION)		(0.50)		
				Very weak light grey LIMESTONE (recovered as light grey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.60	(0.10)	91.51	
				Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 13/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455721.17, 223334.48	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.51m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	92.31	
0.70	D		▼	Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.80	(0.60)	91.71	
0.90	D			Soft to firm light brown (cream) and light grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	1.10	(0.30)	91.41	
1.50	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBURASH FORMATION)	1.40	(0.30)	91.11	
1.80 - 2.50	B			Light grey and light brown very clayey sandy GRAVEL. Gravel is angular to sub angular fine to medium of limestone. (CORNBURASH FORMATION)	1.80	(0.40)	90.71	
2.70 - 3.30	B			Firm to stiff fissured orangish brown mottled bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.70	(0.90)	89.81	
3.50	D			Weak light grey SANDSTONE (recovered as light grey clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	3.30	(0.20)	89.21	
				Base of Excavation at 3.50m	3.50		89.01	
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455814.07, 223336.87	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.40m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	91.20	
0.50	D			Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with high cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.50	(0.30)	90.90	
1.00	D		▼	Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS)	1.00	(0.70)		
1.40	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION) Weak light brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	1.20 1.30	(0.10)	90.20 90.10	
1.90	D			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	1.80	(0.50)	89.60	
2.90	D			Stiff fissured bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.80	(1.00)	88.60	
				Base of Excavation at 3.50m	3.50	(0.70)	87.90	
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455813.89, 223287.63	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.93m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.15	(0.15)	90.78	
				Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.40	(0.25)	90.53	
0.60	D			Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.70	(0.30)	90.23	
				Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with occasional cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1	(0.50)		
1.30	D		▼	Light grey and light brown very clayey sandy GRAVEL. Gravel is angular to sub angular fine to medium of limestone. (CORNBASH FORMATION)	1.20		89.73	
						(0.60)		
1.90	D			Firm to stiff fissured orangish brown mottled bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2			
						(1.50)		
2.90	D							
					3.30		87.63	
				Fine grained Sandstone. Recovered as light grey clayey sub angular fine to coarse GRAVEL with high cobble content. Cobbles are sub angular of sandstone. (FOREST MARBLE FORMATION)	3.40	(0.10)	87.53	
				Base of Excavation at 3.40m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.20m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455763.68, 223286.85	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.75m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	91.55	
				Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.40	(0.20)	91.35	
1.00	D		▼	Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	1.50	(1.10)	90.25	
				Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBRAsh FORMATION)	1.60	(0.10)	90.15	
				Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.20m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455713.97, 223287.41	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.38m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.40	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	92.18	
0.80	D			Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.60	(0.40)	91.78	
0.80	D			Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	1.20	(0.60)	91.18	
1.70	D		▼	Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	1.60	(0.40)	90.78	
2.40 - 3.00	B			Light grey and light brown very clayey sandy GRAVEL. Gravel is angular to sub angular fine to medium of limestone. (CORNBRAH FORMATION)	2.40	(0.80)	89.98	
3.30	D			Firm to stiff fissured orangish brown mottled bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.20	(0.80)	89.18	
3.30	D			Stiff fissured bluish grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.50	(0.30)	88.88	
				----- Base of Excavation at 3.50m				
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455663.98, 223286.82	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.66m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	92.36	
0.60	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.50	(0.20)	92.16	
1.40 - 1.70	B		▼	Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	1.10	(0.60)	91.56	
1.80	D			Very weak light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.70	(0.60)	90.96	
2.80	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.70	(1.00)	89.96	
3.40	D			Stiff bluish grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (FOREST MARBLE FORMATION)	3.30	(0.60)	89.36	
				Very weak light grey SANDSTONE (recovered as clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	3.50	(0.20)	89.16	
				Base of Excavation at 3.50m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455612.91, 223291.07	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.79m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	92.54	
0.50	D			Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	0.90	(0.65)	91.89	
				Very weak light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.10	(0.20)	91.69	
				Base of Excavation at 1.10m				
					2			
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 19/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.74, 223287.25	Stability: Collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.62m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.40	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	92.42	
				Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)		(0.60)		
1.00	D		▼	Very weak light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.80		91.82	
					1	(0.70)		
				----- Base of Excavation at 1.50m	1.50		91.12	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate fast. 3. Trial pit collapsing form 1.10m due to groundwater entry. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455514.56, 223286.82	Stability: Collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.53m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	92.33	
				Very weak reddish brown LIMESTONE (recovered as reddish brown and grey slightly clayey sandy angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	0.50	(0.30)	92.03	
1.00 - 1.50	B		▼	Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.60	(1.10)	90.93	
				Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate fast. 3. Trial pit collapsing from 1.00m due to groundwater entry. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455464.08, 223287.35	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.79m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	92.49	
0.40	D			Firm reddish brown slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (HEAD DEPOSITS)	0.50	(0.20)	92.29	
				Very weak reddish brown and grey LIMESTONE (recovered as reddish brown and grey slightly clayey sandy angular fine to coarse GRAVEL with high cobble and boulder content). (CORNBASH FORMATION)	1.00	(0.50)	91.79	
1.10	D		▼	Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.40	(0.40)	91.39	
1.50	D			Very weak light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.90	(0.50)	90.89	
2.00	D			Firm to stiff, thinly laminated orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	2.60	(0.70)	90.19	
2.80	D			Stiff grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (CORNBASH FORMATION)	3.20	(0.60)	89.59	
3.30	D			Very weak light grey SANDSTONE (recovered as clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	3.30	(0.10)	89.49	
				Base of Excavation at 3.30m				
				4				
				5				

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.20m, flow rate fast. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455513.95, 223237.26	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.86m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	91.61	
				Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	0.70	(0.45)	91.16	
0.80	D		▼	Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.90	(0.20)	90.96	
				Base of Excavation at 0.90m				
				1				
				2				
				3				
				4				
				5				

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.46, 223231.26	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 91.73m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	91.43	
0.50	D			Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	0.80	(0.50)	90.93	
0.80 - 1.20	B		▼	Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.50	(0.70)	90.23	
1.50	D			----- Base of Excavation at 1.50m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate fast. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455613.81, 223236.82	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.03m OD	Plant: 13T360	0.60m <input type="text"/>

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	91.83	
0.60	D			Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	0.70	(0.50)	91.33	
1.00 - 1.50	B		▼	Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1	(0.90)	90.43	
1.70	D			Firm to stiff, thinly laminated orangish brown and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	1.60	(1.00)	89.43	
2.70	D			Firm to stiff fissured orangish brown mottled bluish grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.60	(0.30)	89.13	
				Very weak light grey fine grained SANDSTONE (recovered as clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	2.90	(0.10)	89.03	
				Base of Excavation at 3.00m	3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455663.85, 223237.22	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 92.09m OD	Plant: 13T360	0.60m <input type="text"/>

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	91.79	
				Firm to stiff orangish brown, light brown (cream) and grey mottled slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	1.00	(1.00)	90.79	
Base of Excavation at 1.30m					1.30		90.79	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Soil infiltration test carried out in trial pit, results reported seperately. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455714.03, 223237.07	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.88m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	91.63	
1.00	D		▼	Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS) Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.30	(0.05)	91.58	
				Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.40		90.48	
				Base of Excavation at 1.45m	1.45	(0.05)	90.43	

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 16/11/2020	Logged By: TB	Checked By: CV	
Client: Countryside Properties	Co-ords: 455764.15, 223237.18	Stability: No collapse	Dimensions: 2.50m	Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.29m OD	Plant: 13T360	0.60m	

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.99	
				Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.80	(0.50)	90.49	
0.90	D		▼	Soft to firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	1	(0.75)		
1.50	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBRAsh FORMATION)	1.55	(0.05)	89.74	
				Base of Excavation at 1.60m	1.60		89.69	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 18/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455814.05, 223237.08	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.64m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	90.39	
0.50	D			Reddish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.40	(0.15)	90.24	
1.00	D			Firm locally soft orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS)	0.70	(0.30)	89.94	
1.50 - 2.00	B		▼	Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with occasional cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBRAsh FORMATION)	1	(0.80)		
				Extremely weak light grey and light brown LIMESTONE. (CORNBRAsh FORMATION)	1.50	(0.50)	89.14	
2.10	D			Firm to stiff fissured orangish brown mottled bluish grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2	(1.10)	88.64	
3.20	D			Stiff fissured bluish grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.10	(0.20)	87.54	
3.40	D			Weak light grey fine grained SANDSTONE (recovered as clayey sub angular fine to coarse GRAVEL with high cobble content). (FOREST MARBLE FORMATION)	3.30	(0.10)	87.34	
				Base of Excavation at 3.40m	3.40	(0.10)	87.24	
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 18/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455884.97, 223242.08	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.84m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	89.54	
0.50	D			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	88.94	
				Weak orangish brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBURASH FORMATION)	0.95	(0.05)	88.89	
				Base of Excavation at 0.95m				

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456014.51, 223237.03	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.34m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	88.04	
0.50	D			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	87.44	
1.00 - 1.50	B		▼	Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.60	(0.70)	86.74	
2.00	D			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	2.20	(0.60)	86.14	
3.00	D			Firm to stiff fissured orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.95	(0.75)	85.39	
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse, GRAVEL). (FOREST MARBLE FORMATION)	3.00	(0.05)	85.34	
				Base of Excavation at 3.00m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.90m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456063.76, 223237.23	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.82m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.35	(0.35)	87.47	
			▼	Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.55)	86.92	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.40	(0.50)	86.42	
1.50	D			Light grey and light brown very clayey GRAVEL with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.70	(0.30)	86.12	
1.80	D			Firm to stiff thinly to thickly laminated orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is sub angular fine to medium limestone lithorelicts. (FOREST MARBLE FORMATION)	2.30	(0.60)	85.52	
2.40	D			Soft light grey and light brown (cream) slightly sandy gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (FOREST MARBLE FORMATION)	2.85	(0.55)	84.97	
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.90	(0.05)	84.92	
				Base of Excavation at 2.90m	3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.70m, flow rate fast. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456113.65, 223187.03	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.02m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	86.72	
0.50	D		▼	Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	1.20	(0.90)	85.82	
1.30	D			Light grey and light brown very clayey GRAVEL with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (HEAD DEPOSITS)	1.50	(0.30)	85.52	
1.50 - 2.00	B			Firm to stiff thinly to thickly laminated orangish brown mottled grey slightly sandy slight gravelly CLAY. Gravel is sub angular fine to medium limestone lithorelicts. (FOREST MARBLE FORMATION)	2.85	(1.35)	84.17	
2.90	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.90	(0.05)	84.12	
				Base of Excavation at 2.90m				

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate fast. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 23/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456064.04, 223186.91	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.50m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	87.30	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)		(0.60)		
			▼	Firm to stiff light brown and light grey mottled gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)		(0.70)		
----- Base of Excavation at 1.50m -----					1.50		86.00	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.90m, flow rate moderate. 3. Soil infiltration test carried out in trial pit, results reported seperately. 4. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 24/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456022.58, 223190.99	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.98m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	87.68	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.80	(0.50)	87.18	
1.00	D		▼	Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.40	(0.60)	86.58	
1.50	D			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.90	(0.50)	86.08	
2.00	D			Firm to stiff fissured orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.95	(1.05)	85.03	
2.50 - 3.00	B			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse, GRAVEL). (FOREST MARBLE FORMATION)	3.00	(0.05)	84.98	
				Base of Excavation at 3.00m				
4								
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.90m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 24/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455963.95, 223186.99	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.58m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	88.28	
			▼	Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	87.68	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.20	(0.30)	87.38	
1.30	D			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.90	(0.70)	86.68	
2.00	D			Firm to stiff fissured orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.08	(1.18)	85.50	
3.00	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	3.40	(0.02)	85.48	
				Base of Excavation at 3.10m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.70m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 20/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455913.91, 223186.73	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.30m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	B			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	89.00	
0.40	ES			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)		(0.70)		
1.00	D		▼	Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.00		88.30	
1.40	HSV	114kPa				(0.70)		
1.70					1.70		87.60	
1.80	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	1.80	(0.10)	87.50	
1.90				Weak light brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2	(0.40)		
2.20					2.20		87.10	
2.30	D			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)				
3.30	D					(1.18)		
					3.38		85.92	
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	3.40	(0.02)	85.90	
				Base of Excavation at 3.40m				
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. A set of hand shear vane tests were carried out with the results shown on the log above. 4. Trial pit backfilled with arisings on completion.


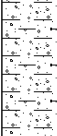
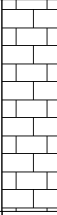


Method: Trial Pit	Date(s): 18/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455813.91, 223186.93	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.22m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	89.97	
0.30 - 0.80	B			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.80	(0.55)	89.42	
0.90	D		▼	Firm orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	1.00	(0.20)	89.22	
1.20	D			Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with occasional cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.60	(0.60)	88.62	
1.65	D			Extremely weak light grey and light brown LIMESTONE. (FOREST MARBLE FORMATION)	1.70	(0.10)	88.52	
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	1.80	(0.10)	88.42	
				Base of Excavation at 1.80m	2			
					3			
					4			
					5			


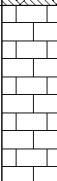
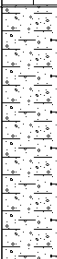

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 18/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455763.64, 223187.07	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.78m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.48	
				Soft reddish brown slightly gravelly sandy CLAY. Gravel is angular to sub angular fine to coarse of limestone (HEAD DEPOSITS)	0.80	(0.50)	89.98	
			▼	Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.50	(0.70)	89.28	
				----- Base of Excavation at 1.50m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.90m, flow rate moderate. 3. Soil infiltration test carried out in trial pit, results reported seperately. 4. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 18/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455713.92, 223187.25	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.25m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.95	
0.30 - 0.90	B			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.90	(0.60)	90.35	
1.00 1.00	D HSV	91kPa		Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.78	(0.88)	89.47	
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	1.80	(0.02)	89.45	
				Base of Excavation at 1.80m	2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. A set of hand shear vane tests were carried out with the results shown on the log above. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455664.05, 223186.96	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.43m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	91.23	
0.50	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.40	(0.20)	91.03	
0.50	D			Firm to stiff orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	1.30	(0.90)	90.13	
1.50	D			Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.80	(0.50)	89.63	
1.70	D							
1.80 - 2.40	B			Firm to stiff fissured orangish brown mottled bluish grey gravelly CLAY with occasional plant fossils. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2	(1.70)		
3.50	D				3.50		87.93	
				----- Base of Excavation at 3.50m -----				
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455613.98, 223186.97	Stability: No collapse	Dimensions: 2.50m 0.60m
Hydrock Project No: C-16153	Ground Level: 91.47m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.30	B			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	91.17	
0.40	ES			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.60	(0.30)	90.87	
0.70	D		▼	Firm to stiff orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	1.00	(0.40)	90.47	
				Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.10	(0.10)	90.37	
				Base of Excavation at 1.10m				
2								
3								
4								
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate fast. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455563.94, 223187.15	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 91.18m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	90.93	
0.50	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION) Firm to stiff orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	0.40	(0.15)	90.78	
					1.30		89.88	
1.70	D			Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.60	(0.30)	89.58	
				Very weak light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (FOREST MARBLE FORMATION)	1.90	(0.30)	89.28	
				Base of Excavation at 1.90m	2			
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455599.92, 223137.48	Stability: No collapse	Dimensions: 2.50m 0.60m <input type="text"/>
Hydrock Project No: C-16153	Ground Level: 90.67m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.37	
0.30 - 0.50	B			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.50	(0.20)	90.17	
1.00	D			Firm to stiff orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	1.30	(0.80)	89.37	
				Very weak thinly bedded light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.50	(0.20)	89.17	
				Base of Excavation at 1.50m				
					2			
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.30m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 11/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455664.35, 223136.92	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.78m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.48	
				Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.50	(0.20)	90.28	
1.00	D			Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1	(1.00)		
1.20	HSV	89kPa			1.50		89.28	
1.60	D			Very weak thinly bedded to thickly laminated light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.60	(0.10)	89.18	
				Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. A set of hand shear vane tests were carried out with the results shown on the log above. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 12/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455713.84, 223136.97	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.77m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	90.47	
0.90	D			Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL of limestone with medium cobble content). (CORNBASH FORMATION)	0.90	(0.60)	89.87	
				Firm to stiff brown mottled grey slightly gravelly sandy CLAY with occasional calcareous nodules fragments. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)	1.80	(0.90)	88.97	
				Weak light brown and light grey LIMESTONE (recovered as clayey sandy angular fine to coarse GRAVEL). (CORNBASH FORMATION)	1.90	(0.10)	88.87	
				Base of Excavation at 1.90m				
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 11/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455764.06, 223137.08	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 90.26m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	89.96	
0.50 - 1.00	B			Very weak orangish brown LIMESTONE (recovered as clayey sandy angular to sub angular fine to coarse GRAVEL of limestone with medium cobble content). (CORNBASH FORMATION)		(0.70)		
1.20	D			Firm to stiff brown mottled grey slightly gravelly sandy CLAY with occasional calcareous nodules fragments. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (CORNBASH FORMATION)		(0.80)		
				Weak light brown and light grey LIMESTONE (recovered as clayey sandy angular fine to coarse GRAVEL). (CORNBASH FORMATION)	1.80	(0.10)	88.46	
				Base of Excavation at 1.90m	1.90	(0.10)	88.36	

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.


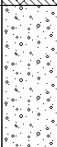



Method: Trial Pit	Date(s): 20/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455863.92, 223136.84	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.60m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	89.30	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	88.70	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAH FORMATION)	1.60	(0.70)	88.00	
1.70	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	1.70	(0.10)	87.90	
				Base of Excavation at 1.70m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455913.79, 223136.87	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.94m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	88.64	
0.30 - 0.80	B			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.78	(0.48)	88.16	
				Weak orangish brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBASH FORMATION)	0.80	(0.02)	88.14	
				Base of Excavation at 0.80m				
								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455963.89, 223136.94	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.32m OD	Plant: 13T360	0.60m <input type="text"/>

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	88.02	
0.80	D			Weak orangish brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBASH FORMATION)	0.80	(0.50)	87.52	
				----- Base of Excavation at 0.80m	1			
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456010.70, 223131.76	Stability: Collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.79m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	87.49	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.80	(0.50)	86.99	
1.00	D		▼	Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.50	(0.70)	86.29	
1.50 - 2.00	B			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	2.00	(0.50)	85.79	
2.20	D			Firm to stiff fissured orangish brown mottled grey slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone and mudstone. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	3.05	(1.05)	84.74	
3.10	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION) Base of Excavation at 3.10m	3.10	(0.05)	84.69	
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.90m, flow rate moderate. 3. Trial pit collapsing from 1.30m due to groundwater entry. 4. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456113.87, 223087.28	Stability: No collapse	Dimensions: 2.50m 0.60m
Hydrock Project No: C-16153	Ground Level: 86.72m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	86.42	
0.30 - 1.00	B		▼	Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	1.00	(0.70)	85.72	
1.10	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.30	(0.30)	85.42	
1.40	D			Very weak light brownish grey LIMESTONE. (Recovered as clayey gravel with medium cobble content). (CORNBASH FORMATION)	1.70	(0.40)	85.02	
1.90	D			Firm to stiff thinly to thickly laminated orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is sub angular fine to medium limestone lithorelicts. (FOREST MARBLE FORMATION)	2.30	(0.60)	84.42	
2.40	D			Stiff brown mottled bluish grey sandy slightly gravelly CLAY. Gravel is sub angular fine to coarse limestone lithorelicts. (FOREST MARBLE FORMATION)	2.40	(0.10)	84.32	
				Base of Excavation at 2.40m				
				3				
				4				
				5				


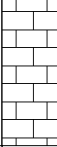
General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit collapsing below 1.00m due to groundwater entry. 4. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456013.77, 223086.93	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.47m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	87.17	
0.30 - 0.80	B			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	86.57	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.80	(0.90)	85.67	
2.00	D			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	2.10	(0.30)	85.37	
2.20	D			Firm to stiff fissured orangish brown mottled grey CLAY with sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.40	(0.30)	85.07	
2.50	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.50	(0.10)	84.97	
				Base of Excavation at 2.50m				
					3			
					4			
					5			


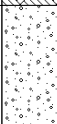

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.80m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 23/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455963.78, 223087.12	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.03m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	87.73	
0.80	D			Weak orangish brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBASH FORMATION)	0.80	(0.50)	87.23	
				----- Base of Excavation at 0.80m				
				1 2 3 4 5				

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 23/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455913.87, 223086.57	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.53m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	
Depth (m)	Type	Results							
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	88.23		
0.70 - 1.00	B			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.70	(0.40)	87.83		
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAsh FORMATION)	1.00	(0.30)	87.53		
				▼ Base of Excavation at 1.00m					
					2				
					3				
					4				
					5				

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.00m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 11/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455814.73, 223087.45	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.51m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	89.31	
0.50	D			Soft to firm orangish and light brown (cream) gravelly slightly sandy CLAY with medium cobble and low boulder content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	1.10	(0.90)	88.41	
1.20	D			Soft to firm orangish and light brown (cream) mottled light grey gravelly slightly sandy CLAY with medium cobble and low boulder content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	1.50	(0.40)	88.01	
1.60	D			Light brown and light grey clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and medium boulder content. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	2.00	(0.50)	87.51	
2.10	D			Firm to stiff orangish brown and grey mottled slightly gravelly sandy CLAY with occasional calcareous nodules fragments. Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. (FOREST MARBLE FORMATION)	2.70	(0.70)	86.81	
2.90	D			Stiff thickly laminated to thinly bedded orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. (FOREST MARBLE FORMATION)	3.20	(0.50)	86.31	
3.30	D			Stiff to very thickly laminated to thinly bedded bluish grey gravelly CLAY with a medium cobble content. Gravel is sub angular fine to coarse mudstone lithorelicts. Cobbles are sub angular of mudstone. (FOREST MARBLE FORMATION)	3.50	(0.30)	86.01	
				----- Base of Excavation at 3.50m				
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 11/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455765.61, 223086.50	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.79m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	89.49	
0.50 - 1.00	B			Orangish brown very clayey sandy angular to sub angular fine to coarse GRAVEL of limestone with medium cobble content. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.50	(0.20)	89.29	
1.50	D			Soft to firm orangey and light brown (cream) mottled light grey gravelly slightly sandy CLAY with medium cobble and low boulder content. Gravel is angular to sub angular fine to coarse of limestone with medium cobble content. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	1.50	(1.00)	88.29	
1.80	D			Very weak light brown and light grey LIMESTONE (recovered as clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and medium boulder content). (FOREST MARBLE FORMATION)	1.80	(0.40)	87.89	
----- Base of Excavation at 1.90m					1.90		87.89	
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455716.72, 223096.64	Stability: No collapse	Dimensions: 0.60m x 2.50m
Hydrock Project No: C-16153	Ground Level: 90.17m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.15	(0.15)	90.02	
0.50	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.50	(0.35)	89.67	
1.20	HSV	82kPa		Firm to stiff orangish brown, light brown (cream) and grey mottled gravelly slightly sandy CLAY with medium cobble content . Sand is fine to medium. Gravel is sub angular to sub rounded fine to medium of limestone. Cobbles are angular to sub angular of limestone (CORNBASH FORMATION)	1.20	(0.70)	88.97	
1.30	D			Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with occasional cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.30	(0.40)	88.57	
1.65	D			Very weak light brown and light grey LIMESTONE (recovered as clayey very sandy angular fine to coarse GRAVEL). (CORNBASH FORMATION)	1.60	(0.10)	88.47	
				Very weak thinly bedded to thickly laminated light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (FOREST MARBLE FORMATION)	1.70	(0.10)	88.37	
				Base of Excavation at 1.80m	1.80			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. A set of hand shear vane tests were carried out with the results shown on the log above. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 17/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455665.46, 223106.20	Stability: No collapse	Dimensions: 0.60m x 2.50m
Hydrock Project No: C-16153	Ground Level: 90.37m OD	Plant: 13T360	Scale: 1:25

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	90.12	
0.50	D			Very weak reddish brown and grey LIMESTONE (recovered as slightly clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	0.40	(0.15)	89.97	
0.80	HSV	70kPa		Firm to stiff light brown mottled light grey slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	1.10	(0.70)	89.27	
1.10 - 1.20	B			Very weak thinly bedded to thickly laminated light brown and light grey LIMESTONE (recovered as slightly clayey very sandy angular fine to coarse GRAVEL of limestone with high cobble and boulder content). (CORNBASH FORMATION)	1.20	(0.10)	89.17	
				Base of Excavation at 1.20m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. A set of hand shear vane tests were carried out with the results shown on the log above. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 20/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455800.63, 223047.07	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 89.18m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.10	(0.10)	89.08	
				Soft reddish brown slightly sandy gravelly CLAY with a medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone (HEAD DEPOSITS)	0.30	(0.20)	88.88	
0.70	D			Soft to firm orangey and light brown (cream) mottled light grey gravelly slightly sandy CLAY with medium cobble and low boulder content. Gravel is angular to sub angular fine to coarse of limestone with medium cobble content. Cobbles and boulders are angular to sub angular of limestone. (HEAD DEPOSITS)	1.50	(1.20)	87.68	
1.60	D			Very weak light brown and light grey LIMESTONE (recovered as clayey sandy angular fine to coarse GRAVEL of limestone with high cobble and medium boulder content). (FOREST MARBLE FORMATION) Base of Excavation at 1.60m	1.60	(0.10)	87.58	

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater encountered from surface, flow rate slow. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 23/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455864.30, 223037.04	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.61m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m/bgl	Thickness (m)	Level m OD	Legend	
Depth (m)	Type	Results							
				Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	88.36		
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.60	(0.35)	88.01		
				Firm to stiff light brown and light grey mottled gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAsh FORMATION)	1	(0.90)			
				Base of Excavation at 1.50m				1.50	87.11
					2				
					3				
					4				
					5				

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 0.60m, flow rate moderate. 3. Soil infiltration test carried out in trial pit, results reported seperately. 4. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 20/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455914.08, 223036.94	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 88.26m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10 0.20 - 0.60	ES B			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	88.06	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)		(0.60)		
1.00	D			Firm to stiff light brown and light grey mottled gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAsh FORMATION)	1	(0.70)	87.46	
2.00	D			Firm to stiff light brown mottled light grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Gravel is angular to sub angular fine to coarse of limestone. (FOREST MARBLE FORMATION)	2	(0.60)	86.76	
2.20	D			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.10	(1.10)	86.16	
3.20	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	3.20	(0.04)	85.06	
				Base of Excavation at 3.20m				
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 455963.71, 223037.10	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.69m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	87.39	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	86.79	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.60	(0.70)	86.09	
1.70	D			Soft light grey and light brown gravelly CLAY with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (CORNBASH FORMATION)	2.00	(0.40)	85.69	
2.10	D			Firm to stiff fissured orangish brown mottled grey slightly gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.20	(0.20)	85.49	
2.20 - 2.30	B			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.30	(0.10)	85.39	
				Base of Excavation at 2.30m				
3								
4								
5								

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456014.31, 223036.85	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 87.19m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend	
Depth (m)	Type	Results							
0.30	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	86.94		
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.80	(0.55)	86.39		
0.90	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBRAH FORMATION)	1.50	(0.70)	85.69		
1.60	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (CORNBRAH FORMATION)	1.70	(0.20)	85.49		
1.80	D			Weak light brown LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.00	(0.30)	85.19		
2.10	D			Firm to stiff fissured orangish brown mottled grey gravelly CLAY. Gravel is sub angular fine to medium mudstone lithorelicts. Fissures are extremely closely spaced, horizontally oriented. (FOREST MARBLE FORMATION)	2.30	(0.30)	84.89		
				Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.40	(0.10)	84.79		
				Base of Excavation at 2.40m					

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.50m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456064.19, 223036.92	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 86.76m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.25	(0.25)	86.51	
0.50	D			Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS) Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	0.35	(0.10)	86.41	
1.50	D		▼		1.60		85.16	
1.80	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	1.80	(0.20)	84.96	
				Base of Excavation at 1.80m				
					2			
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.50m, flow rate moderate. 3. Trial pit backfilled with arisings on completion.



Method: Trial Pit	Date(s): 26/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456064.28, 222987.08	Stability: Collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 86.33m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.30	(0.30)	86.03	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)	0.90	(0.60)	85.43	
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1.50	(0.60)	84.83	
1.60	D		▼	Very weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	1.90	(0.40)	84.43	
2.00	D			Firm to stiff thinly to thickly laminated orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is sub angular fine to medium limestone lithorelicts. (FOREST MARBLE FORMATION)	2.40	(0.50)	83.93	
2.45	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.50	(0.10)	83.83	
				Base of Excavation at 2.50m				
					3			
					4			
					5			

General Remarks:
 1. Trial pit mechanically excavated. 2. Groundwater encountered at 1.50m, flow rate moderate. 3. Trial pit collapsing below 0.90m, partially due to groundwater entry. 4. Trial pit backfilled with arisings on completion.

Method: Trial Pit	Date(s): 25/11/2020	Logged By: TB	Checked By: CV
Client: Countryside Properties	Co-ords: 456013.46, 222987.22	Stability: No collapse	Dimensions: 2.50m Scale: 1:25
Hydrock Project No: C-16153	Ground Level: 86.72m OD	Plant: 13T360	0.60m

Samples / Tests			Water-Strikes	Stratum Description	Depth m bgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10	ES			Soft brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to sub angular fine to coarse of limestone. (TOPSOIL)	0.20	(0.20)	86.52	
				Orangish brown and grey sandy slightly clayey sub-angular fine to coarse limestone GRAVEL with a high sub-angular to sub-rounded limestone cobble and boulder content. (HEAD DEPOSITS)		(0.70)		
1.00	D			Firm to stiff, orangish brown, light brown and light grey mottled slightly sandy gravelly CLAY. Gravel is angular to sub angular fine to coarse of limestone. (CORNBASH FORMATION)	1	(0.60)	85.82	
1.50 - 1.90	B			Light grey and light brown very clayey GRAVEL with medium cobble content. Gravel is angular to sub angular fine to coarse of limestone. Cobbles are angular to sub angular of limestone. (FOREST MARBLE FORMATION)	1.50	(0.40)	85.22	
2.00 - 2.40	B			Firm to stiff thinly to thickly laminated orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is sub angular fine to medium limestone lithorelicts. (FOREST MARBLE FORMATION)	2	(0.50)	84.32	
2.90	D			Weak light grey LIMESTONE (recovered as sandy angular to sub angular fine to coarse GRAVEL). (FOREST MARBLE FORMATION)	2.40	(0.50)	84.32	
				Base of Excavation at 2.90m	2.90		83.82	
					3			
					4			
					5			

General Remarks:
1. Trial pit mechanically excavated. 2. Groundwater not encountered. 3. Trial pit backfilled with arisings on completion.