

22nd May 2019
Report No 4292/02 Issue 2

The Oaks, Wrexham Industrial Estate

MINERAL POTENTIAL ASSESSMENT REPORT

Carried Out For: Cefn Park Developments Ltd

Planning Consultant: J10 Planning Ltd



THE OAKS, WREXHAM INDUSTRIAL ESTATE

MINERAL POTENTIAL ASSESSMENT REPORT

Date: 22/05/2019

Report No 4292/01 Issue 1

Prepared for: Cefn Park Developments Ltd

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DOCUMENT INFORMATION AND CONTROL SHEET

Document Status and Approval Schedule

Report No.	Title
4292/01	THE OAKS, WREXHAM INDUSTRIAL ESTATE MINERAL POTENTIAL ASSESSMENT REPORT

Issue History

Issue	Status	Date	Contributors	Signature	Date
1	For use	29/03/2019	Prepared By: C. S. Eccles	<i>C. S. Eccles</i>	29/03/2019
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			Approved By: C. S. Eccles	<i>C. S. Eccles</i>	29/03/2019
2	Final	22/05/2019	Prepared By: J Thorburn FGS BSc	<i>J Thorburn</i>	22/05/2019
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DISCLAIMER

This report should be read with the Service Constraints Report Limitations & Planning Requirements set out in Appendix A.



FS573193



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THE OAKS, WREXHAM INDUSTRIAL ESTATE

MINERAL POTENTIAL ASSESSMENT REPORT

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THE OAKS, WREXHAM INDUSTRIAL ESTATE

MINERAL POTENTIAL ASSESSMENT REPORT

1. INTRODUCTION

1.1 Background Information

1.1.1 TerraConsult Limited was commissioned by J10 Planning Limited on behalf of Cefn Park Developments Ltd to carry out an assessment of mineral potential prior to a commercial development of an area of land off Oak Road in Wrexham Industrial Estate. The purpose of this report is to provide information to positively address and meet the requirements of:

- The Minerals Policy MW9 in the Wrexham County Borough Council Unitary Development Plan 1996-2011. Note that the current Local Development Plan (LDP) for 2013 – 2028 is still under consultation.
- Planning Policy Wales (Ed 10, November 2018) including Minerals Planning Policy Wales.
- Minerals Technical Advice Note (Wales) 1: Aggregates.

1.1.2 TerraConsult's service constraints and report limitations are presented in Appendix A.

1.2. Development Proposals

1.2.1 The proposed development of the site is indicated in Figure 1 and is understood to comprise:

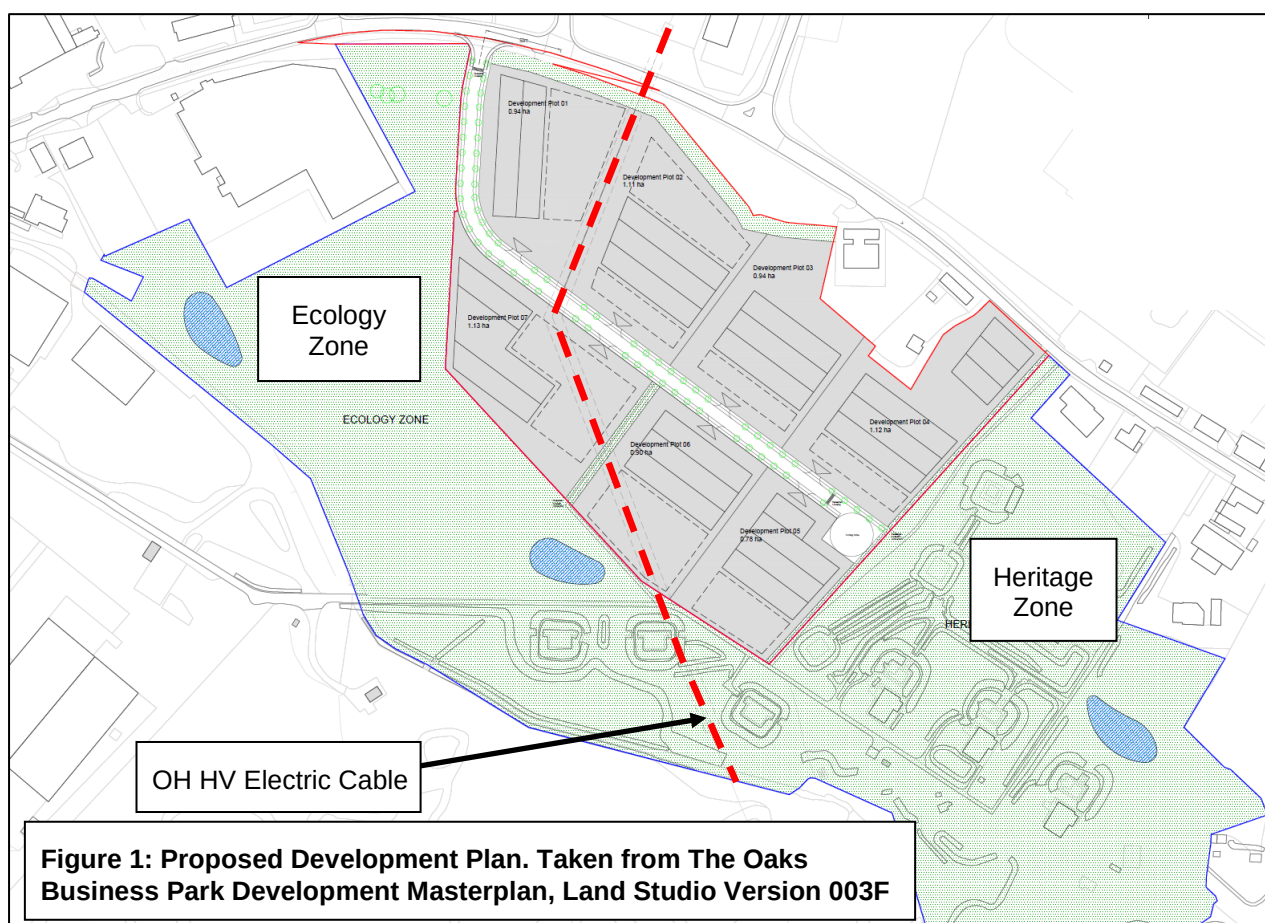
- the demolition of some historic buildings, whilst others are to be retained;
- the removal from site or the treatment of any contaminated material encountered during demolition;
- the construction of both single storey and two storey light industrial units including access roads, parking areas and service provision;
- the creation of 'Ecology Mitigation Zone' at the west of the site and an 'Amenity Zone' along the southwest of the site.

1.2.2 Approximately only a third of the site is developable due to two main constraints:

- Ecology
- Heritage

1.2.3 Approximate areas of the site under different land uses are as follows:

- | | |
|----------------------------|-----------------|
| • Total | 22.16 ha |
| • Developable | 6.92 ha (31%) |
| • Infrastructure | 0.73 ha (3 %) |
| • Heritage/Ecology/Amenity | 14.51 ha (66 %) |

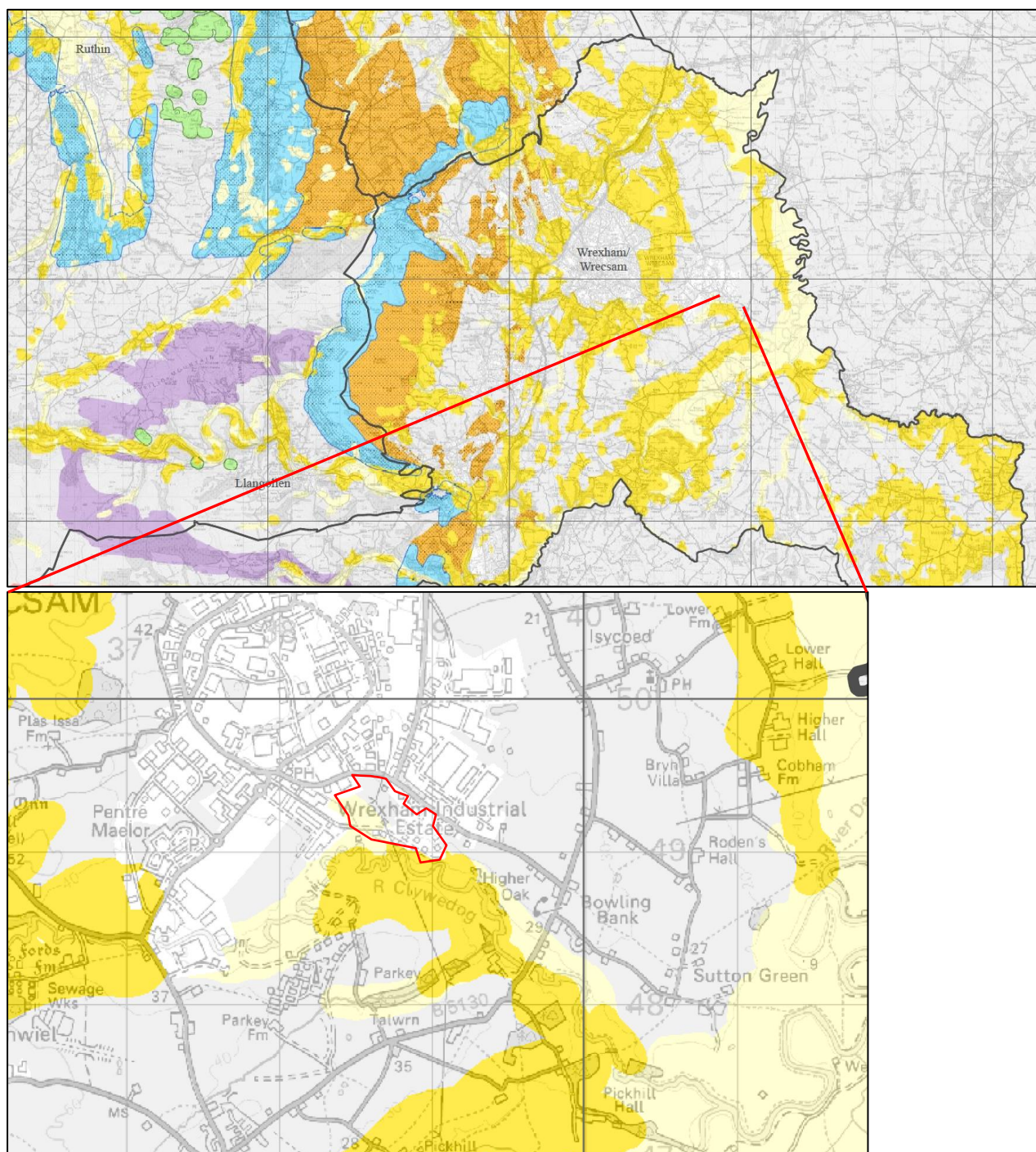


1.3. Planning Status & Requirements

- 1.3.1 Cefn Park Developments Ltd (CPDL) is seeking planning permission for the development outlined above. This report is designed to support the application with regards to providing a statement on the potential impact of the development at the site, all of which lies within the mineral safeguarding planning designation under Minerals Policy MW9 in the Wrexham County Borough Council Unitary Development Plan and meet the requirements of Planning Policy Wales (Ed 10, November 2018). MW9 states:

Policy MW9 Resources of sand and gravel, and clay will be safeguarded from non-mineral development in order to prevent the sterilisation of unworked minerals deposits. The identification of mineral resource areas gives no presumption in favour of the working of any deposits. Within such areas non-mineral development will be strongly resisted unless a resource assessment (or other information) is provided to demonstrate that no exploitable reserves exist within the development site. Where non-mineral development which materially prejudices minerals resources is granted planning permission on land holding minerals deposits, provision should be made for the prior removal of mineral deposits

- 1.3.2 According to the British Geological Survey Safeguarding Map extract North East Wales (BGS, 2012) the mineral deposit at this site is a Sand and Gravel resource.



Key:

Category 1 Aggregates Safeguarding Areas

Ardaloedd Diogelu Agregau Categori 1

- Sand and Gravel
Tywod a Graean
- High Specification Aggregate - Sandstone and Igneous Rocks
Agreg Manyleb Uchel - Tywodfaen a Chreigiau Igneaid
- High Specification Aggregate - Carboniferous Limestone
(stipple denotes high purity >97% CaCO₃)
- Agreg Manyleb Uchel - Calchfean Carbonifferaidd
(y dotwaith yn dynodi purdeb uchel >97% CaCO₃)

Category 2 Aggregates Safeguarding Areas

Ardaloedd Diogelu Agregau Categori 2

- Sand and Gravel
Tywod a Graean
- Sandstone (stipple denotes quartzitic sandstone with potential for silica sand and silica rock)
- Tywodfaen (y dotwaith yn tywodfaen cwsarsitig â photensial am dywod silica a chraig silica)

Figure 2: Extracts of BGS Safeguarding Map Extract North East Wales
1.4. Previous Investigations

- 1.4.1 A number of reports on previous investigations and other relevant information has been provided by the Client for the site. These reports are discussed in Section 4 of this report and the information used to derive the Site Conceptual Model.

2. SITE LOCATION AND DESCRIPTION

2.1 Site Location

- 2.1.1 The site is indicated in Figure 3 below and the site location is summarised in Table 1:



Figure 3: Site Location Plan. Taken from The Oaks Business Park Development Masterplan Prospectus, J10 Planning, April 2018-LS/DMP/version002

Table 1: Summary of Site Location	
Location	The site is located on the south eastern side of Wrexham Industrial Estate off Oak Road, approximately 4.7km to the east of Wrexham town centre
Grid Reference	338707, 349407
Post Code	LL13 9RG (nearest postcode)
Site Area	22 ha approx.
Site Shape	The site is irregular in shape.
Topography	The elevation varies between approximately 24 m OD and 34m OD. The site has many embankments and raised areas across the site predominantly across the central, eastern and southern areas. The site slopes downwards to the River Clywedog on the south western boundary.

2.2 Site Description

2.2.1 A site visit was undertaken on 8th February 2019. The locations of various features are detailed on Drawing No. 4292/1/002. Photographs of the site are presented in Appendix C.

Table 2: Summary of Description of the Site and its Environs	
Current Use:	Unoccupied largely wooded/vegetated area freely accessed by the public. Tyre tracks suggest the area is used for off road vehicles such as quad bikes.
Access	There are two access roadways onto site directly off Oak Road. One is by the north western area of the site opposite Abbey Road. The other access is near the north eastern corner
Existing Buildings& Structures	Several brick buildings are located across the site primarily in the south and south eastern areas. These buildings vary in shape and size with some possibly containing basements. There are tunnels and bunker like structures also on site.
Site Surface	The site is mainly heavily vegetated and wooded over the largely soft landscaped surface with a series of paths, roadways and tracks which cross the site, some of which are of concrete construction (particularly in the southern area forming access routes between the buildings and structures). A compacted gravel area is in the north west of the site which is used as a parking area. Some pooled water in localised depressions.
Vegetation	The site is densely vegetated with bushes, scrub, immature and semi -mature trees in the north and western areas of the site. The southern and eastern areas are predominantly semi mature and mature trees.
Storage Tanks	Below Ground Tanks: No evidence/none suspected. Above Ground Tanks: None present.
Services	Water services were noted next to the access track in the north eastern area of the site in the form of manhole chambers and a service marker post was present in the north western area of the site. A number of pylons carrying overhead electricity lines are present on site. Several infilled/ disused manhole chambers were noted in the southern and eastern areas.
Asbestos	Potential Asbestos Containing Materials (ACMs) were noted by the north eastern entrance in the form of fly tipped cemented sheets
Waste Disposal/ Materials Storage	None.
Surrounding Area	Oak road forms the north boundary with commercial and industrial units beyond. Residential to the north, east and west and fields to the south. Commercial areas are also to the west and south west of the site. The River Clywedog and Redwither Brook run parallel to the southern boundary with undeveloped field beyond and to the east.
Local / Background Knowledge	The site is known to have been part of the Royal Ordnance Factory during the second world war. The disused buildings and roadways are associated with this historical use. The wooded area in the south is known to have been recently used for paintballing and airsoft recreational games.

2.3 Site Ownership

2.3.1 It is understood that the site is currently owned by Cefn Park Developments Ltd.

3. PREVIOUS INVESTIGATIONS/REPORTS

3.1 Historical Scoping Report

Townscape: Chartered Town Planning and Heritage Consultant Ltd, March 2017
Royal Ordnance, Marchwiel, (34), Wrexham. Historical Scoping Report

- 3.1.1 Townscape completed an historical analysis of the site, focussing on the former Royal Ordnance Factory, part of which was located in the area of the proposed development.
- 3.1.2 The report details the construction and use of Royal Ordnance Factory Marchwiel, a 700ha site developed during World War 2. The extent of the ROF compared with The Oaks can be seen in Figure 4, below.

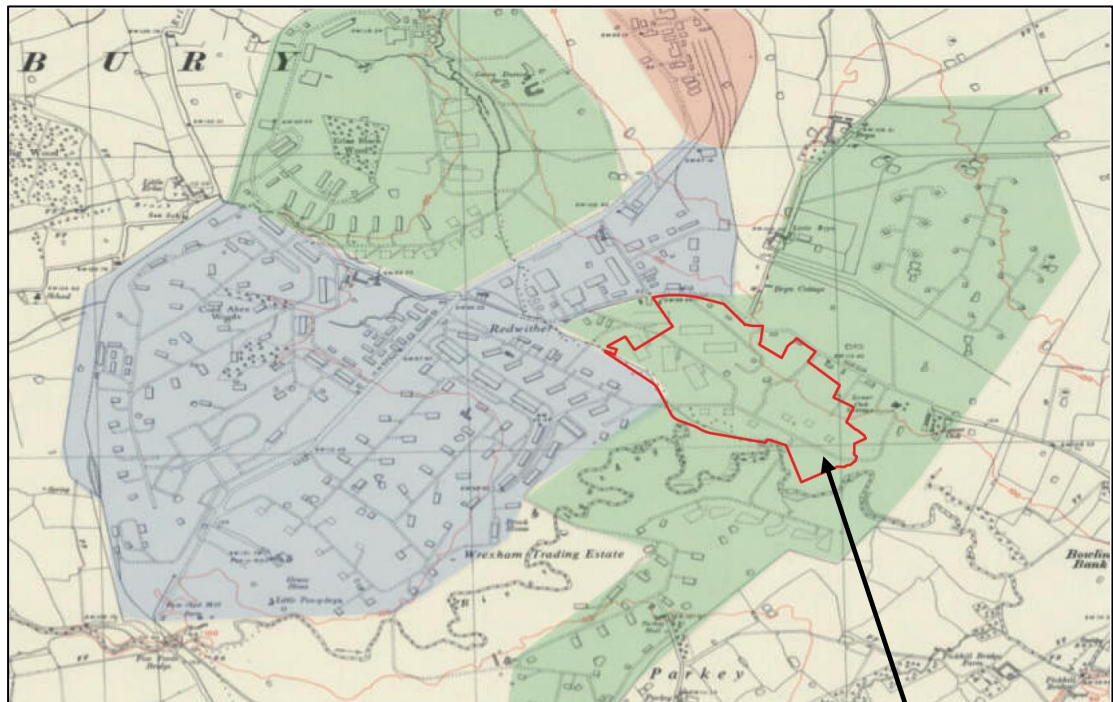


Figure 4: Area for Royal Ordnance Factory Marchwiel The Oaks

- 3.1.3 In Figure 4: ROF footprint shown in green, blue and red. Blue shading corresponds to the main production site, green shading corresponds to storage and depot facilities and red shading is the transport/railway connection. Taken from Townscape Historical Scoping Report.
- 3.1.4 As detailed in the report and shown in Figure 4, the site was not part of the main production area. Earth mound blast walls were constructed on site around ordnance storage buildings though it is assessed by Townscape to be likely that these were either used for storage or simply as a decoy in the case of bombing.
- 3.1.5 Townscape concludes their report stating that the area of the ROF within the site boundary was '*never fully completed nor operational*'.
- 3.1.6 Personal statements from local residents appended to the report further state that no bombs were believed to have been dropped on the area.

- 3.1.7 A personal statement from the site owner details that the levels of the site have been adjusted by the placement of excavated glacial clay from the site of the Kellogg factory on Bryn Lane, Wrexham Industrial Estate, approximately 400 m to the north. Furthermore, the site owner states that a number of concrete structures were demolished, some with explosives.

3.2 Preliminary Flood Risk & Drainage Assessment

Opus International Consultants (UK) Ltd, October 2016

- 3.2.1 The report details the fluvial flood risk and shows that the site occupies land with Flood Zone A, Flood Zone B and Flood Zone C2 as detailed by TAN15. With part of the site located in Flood Zone B and C2, Opus state that modelling would be required.
- 3.2.2 Furthermore, Opus suggests that attenuation ponds are likely to be required due to the increase in impermeable areas through the construction of rooves and hardstanding.
- 3.2.3 Further details of flood risk and drainage design are provided in TerraConsult report 4292R03-1.

3.3 Phase 1 (Desk Study) Investigation Report, The Oaks

Opus International Consultants (UK) Ltd, March 2017. Report ref V-R6399.00 The Oaks, Oak Road, Wrexham Industrial Estate, Wrexham

- 3.3.1 The Phase 1 Report completed by Opus details the environmental setting of the site and its historic uses from 1879 to 2016.

History

- 3.3.2 Between 1879 and 1938, the site was undeveloped. A small brook ran along the southern boundary of the site and a number of ponds were present.
- 3.3.3 During the Second World War, the site was used as part of Royal Ordnance Factory (ROF) Wrexham. The ROF site is understood to have been used for the production of nitro-glycerine and nitrocellulose as part of the larger process of cordite production. No historical mapping is available between 1938 and 1954. By 1954, a number of mounded buildings and associated tracks were present. The ponds were not present on this series of mapping and the brook at the southern boundary is named as Redwither Brook.
- 3.3.4 The majority of these buildings were removed by the maps of 1979, with an electricity pylon located in the centre of the site. The site appears to have been left derelict with no changes from 1982.

Geology

- 3.3.5 Through review of Technical Report WA/91/4 Applied geological mapping in the Wrexham area: geology and land-use planning and online BGS borehole data, the underlying superficial geology across the site was deemed to include the following strata:
- Made Ground;
 - Alluvium – south eastern corner of site;
 - River Terrace Deposits – along Redwither Brook;
 - Glacial Till – whole site; and
 - Basal Sand and Gravel.

The solid geology across the site was deemed to consist of:

- Salop Formation – Mudstone and Sandstone; and
- Kinnerton Sandstone Formation – Sandstone.

3.3.6 The superficial deposits were assessed to be Secondary Aquifer A, whilst the bedrock formations are listed as Primary Aquifers.

3.3.7 The risk of coal mining was assessed to be low by Opus due to the Kinnerton Sandstone Formation not having any coal seams, removing the risk of shallow workings. Deep workings associated with the former Bersham Colliery pose no risk as the colliery closed in 1986, over 30 years ago. No recorded shafts were noted within 5 kilometres of the site.

Environment

3.3.8 A review of an environmental database report (not appended as part of Opus's report therefore not seen by TCL) yielded the following observations on the environmental setting.

3.3.9 The Redwither Brook is the nearest surface water body to the site, located 3 m to the south west. The River Clywedog is designated as a primary river and is located 15 m to the south east of the site.

3.3.10 The site has been assumed to lie within an intermediate probability radon area (5-10% of properties at or above the action level). This is due to the radon section of the environmental database report being incomplete. As such, basic protective measures against radon will be required.

3.3.11 There are three registered radioactive substances entries within 250 m of the site, the nearest being 175 m north.

3.3.12 There are no COMAH, NIHHS or Contaminated Land Register entries within 1 km of the site.

3.3.13 There are no integrated pollution controls with 250 m or local integrated pollution prevention sites within 500 m.

3.3.14 There is one recorded pollution incident on site. The smoke related incident of July 2002 caused minor water impact and no land impact, though significant air impact was recorded.

3.3.15 There are two recorded controlled water pollution incidents on site. Both occurred in Water Company Sewage, Pickhill Bridge.

3.3.16 There are six discharge consents located within 250 m of the site. The nearest of these is 4 m south west of the site regarding trade discharges into a freshwater stream or river.

3.3.17 There are no historical, local authorities or registered landfill sites located within 250 m of the site. Eight waste management facilities were noted within 250 metres of the site, with the nearest being 86 metres northwest. One registered waste transfer site is located 191 m north west.

- 3.3.18 The site is not located within a Nitrate Vulnerable Zone and there are no environmentally sensitive sites within 500 m of the site.
- 3.3.19 Based on the site history and the environmental setting, Opus identified the following potential on site contaminant sources:
- Demolition of previous buildings: heavy metals, Polycyclic Aromatic Hydrocarbons (PAHs), asbestos;
 - The use of the site for storage as part of the ROF: PAHs, Semi Volatile and Volatile Organic Compounds (SVOCs and VOCs), Total Petroleum Hydrocarbons (TPH), sulphates, acidic soil;
 - The electricity generation on site: Poly Chlorinated Biphenyls (PCBs);
 - Possible buried explosives or waste products; and
 - Infilled ground on site: Ground Gases.
- 3.3.20 Opus assessed there to be a low to moderate risk from on-site contaminants associated with the site's history.
- 3.3.21 Based on TerraConsult's assessment of the data and the other reports discussed previously, Opus have probably over-stated the risk from contaminants because:
- The fill material on site is likely to be natural 'inert' soils free of contaminants with the most likely contaminant is asbestos from building demolition;
 - The site appears not to have been uses for either production or storage of explosives;
 - The level of risk from permanent ground gases (methane, carbon dioxide, etc.) is very low; and
 - We note that site has been assumed to lie within an intermediate probability radon area (5-10% of properties at or above the action level). As such, basic protective measures against radon will be required.

3.4 Intrusive (Phase 2) Site Investigation Report

TerraConsult Ltd, April 2019. Report Ref 4292R01. The Oaks, Oak Road, Wrexham Industrial Estate, Wrexham

- 3.4.1 An Intrusive (Phase 2) site investigation report has been prepared for the development assessing the contamination potential of the site and also the geotechnical characteristics. The borehole logs from this report are presented in Appendix B and these exploratory holes have been used to confirm the geological conditions and the minerals potential of the site.

4. MINERAL DEPOSIT

4.1 General

- 4.1.1 The exploratory holes carried out by TerraConsult were primarily carried out for geotechnical and geo-environmental purposes but these also provide information on the mineral deposit. Exploratory holes were located across site, where access permitted, to gain lateral and vertical coverage of the ground conditions with the site investigation locations shown on Drawing No. 4292/1/002.

Table 3: Purpose of Exploratory Holes	
Exploratory Holes	Target Area
Boreholes formed by cable percussion methods. (BH) BH01 to BH08	To assess deeper ground conditions and allow SPTs and samples for geotechnical characterisation. Located to gain a spread across the site. To install deep monitoring installations.
Dynamic Percussive (Window sampler) boreholes. (WS) WS01 to WS10	To assess shallow ground conditions and allow SPT's to be undertaken. To allow collection of samples for contamination and geotechnical testing. To install shallow monitoring installations.
Trial pits formed by mechanical excavator. (TP) TP01 to TP09	To assess shallow ground conditions both laterally and vertically. To allow collection of samples for contamination and geotechnical testing. Located to gain a spread across the site, avoiding underground services and inaccessible areas.
Hand dug trial pits (HD) HD01 to HD12	To assess shallow ground conditions in areas that could not readily be accessed by plant.

- 4.1.2 The site investigations have allowed the site specific ground conditions to be described and this information was used to provide an improved conceptual ground model. The geology encountered during the site investigations was generally consistent with that anticipated from the desk study. A summary of the general strata encountered across the site is provided in the Table 4 below, with more detailed description given in the following sub sections.

Table 4: Summary of Strata Encountered		
Geological Strata	Maximum Depth Below Ground Level to Base of Strata (m)	Strata Thickness (m)
Topsoil	0.60	0.60
Made Ground	3.00	0.40 – 3.00
Reworked Clay	2.20	0.25 – 2.00
Glacial Till	15.00 (Base not proven)	At least 14.60

4.2 Ground Surface

- 4.2.1 The site is heavily vegetated with discrete asphalt roadways and gravel tracks. There are a number of large mounds across the site.

4.3 Anthropogenic Materials

- 4.3.1 Made Ground was encountered in all exploratory holes across the site. Two kinds of material were encountered.

Gravel

- 4.3.2 Granular Made Ground was recorded at BH01, WS04, TP01, TP03, TP04, TP05 and TP07. The material was generally described as angular to subrounded fine to coarse slightly silty sandy gravel of oil shale. The material was first encountered at depth ranging from ground level at BH01 to 2.70 m bgl at TP04 and proven to depths between 0.10 m bgl at BH01 and 3.00 m bgl at TP04. The proven thickness of the material ranged from 0.10 m at BH01 to 0.40 m at TP01.

Clay

- 4.3.3 Cohesive Made Ground was recorded at all locations and was generally described as soft dark brown slightly sandy slightly gravelly clay with gravel of shale and concrete. The material was encountered from ground level at a number of locations and proved to depths of between 0.30 m bgl at WS10 and 2.70 m bgl at TP04. The maximum proven thickness of the material ranged from 0.15 m at WS10 and TP07 to 2.70 m at TP04.
- 4.3.4 It was often not possible for the site engineer to ascertain the difference between reworked natural material that had been brought from the Kellogg's factory and 'true' Made Ground.
- 4.3.5 No visual or olfactory evidence of contamination was noted during the fieldwork other than the presence of ash (which can be a source of heavy metals, sulphates, PAHs etc.).
- 4.3.6 Concrete obstructions were encountered at 1.48 m bgl at TP03, 1.78 m bgl at TP08 and 1.98 m bgl at BH06. These are believed to be representative of historic slabs.

4.4 Drift Deposits

- 4.4.1 Glacial Till was encountered at all locations that reached their target depth with the exception of TP01. The Glacial Till was described at all locations as stiff slightly sandy slightly gravelly clay. Laminations were noted in all borehole locations at depths ranging from 4.00 m bgl to 12.00 m bgl.
- 4.4.2 Therefore the potential mineral reserve is a clay reserve rather than a sand and gravel reserve.

4.5 Wrexham Policy and Clay Minerals

4.5.1 The Wrexham County Borough Council Unitary Development Plan 1996-2011 states:

Policy MW5 *Proposals for clay extraction will only be permitted where:-*

- a) the clay is required to meet a national or regional shortage of clay with the specific characteristics of the deposits found in the Wrexham area; or*
- b) other committed development would prevent clay resources on the same site from being worked.*

Proposals to develop new sites for clay extraction will only be considered favourably when it can be demonstrated that clay extraction proposals that satisfy the other terms of this policy cannot be met by the extension of existing sites.

4.5.2 Paragraph 11.6 then states:

Clay extraction is a traditional industry in the County Borough and the Hafod Pit near Johnstown, continues to supply material for tile making. The unworked reserves at the site are sufficient to maintain production during the Plan period and it appears unlikely that there will be a demand to open up other clay workings in the County Borough during the plan period. Nevertheless there are still clay deposits in the County Borough which are of high quality and whose composition may be particularly suitable for specialised industrial purposes. While Policy MW5 recognises that there may be interest in working these reserves, it specifies that extraction should take place only in the limited circumstances described. Clay working creates deep voids which can present major restoration problems. In Wrexham this would only be appropriate if it can be demonstrated that there is a proven need for material of a quality and specification which is not readily obtainable from existing sources outside the County Borough.

4.5.3 The draft section of the Wrexham County Borough Local Development Plan (LDP) for February 2016 states that “*clay is now only worked at Hafod landfill to create void space and as engineering material for the landfill*” indicating that there is no current economic requirement for clay minerals in the borough.

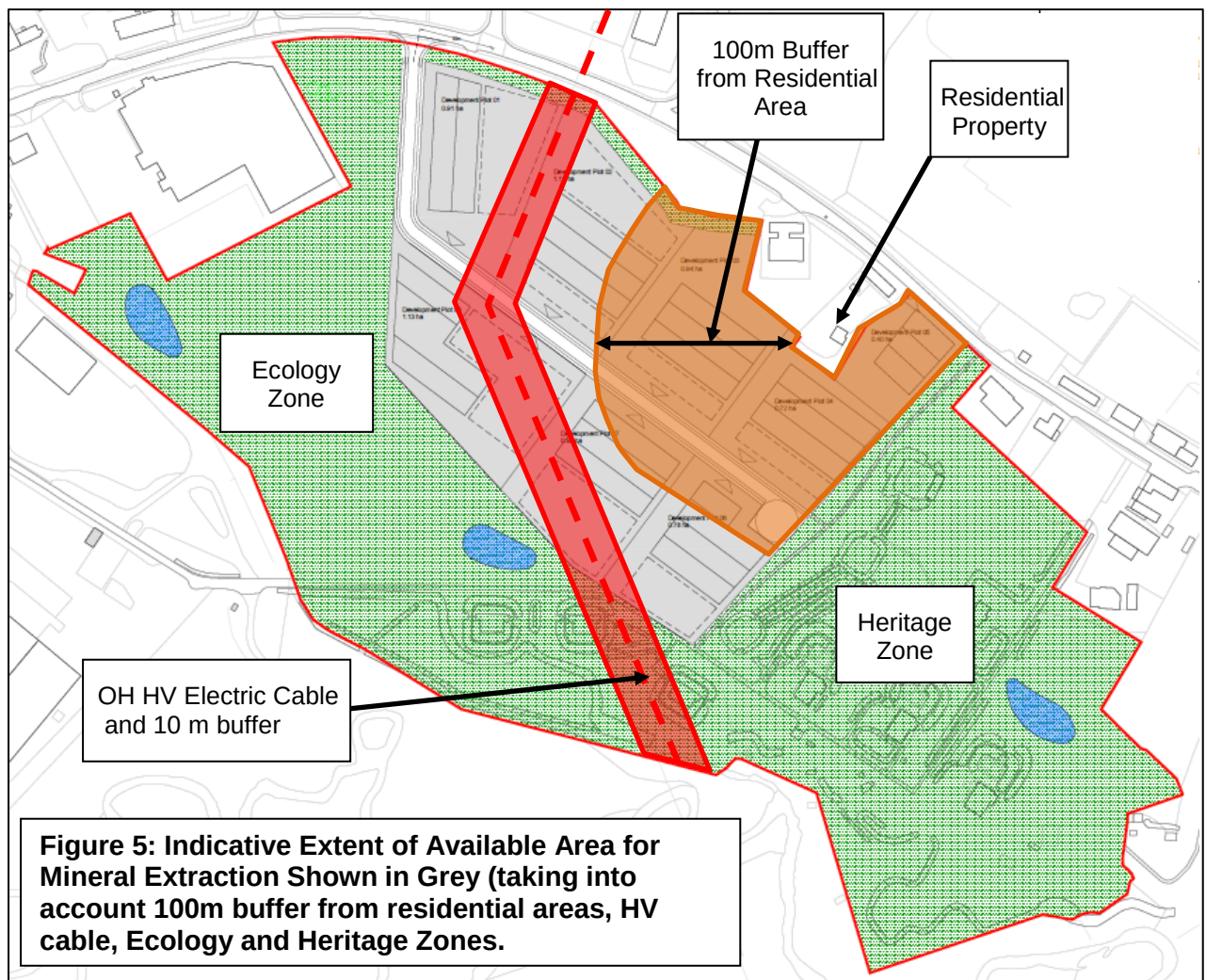
5. IMPACT OF DEVELOPMENT ON MINERALS SAFEGUARDING

5.1.1 The total developable area within the development site is 6.92 ha due to the ecological and heritage restrictions. Only part of this area would be developable due to:

- The residential property adjacent to the north east of the site; and
- The over-head HV Electric cables.

5.1.2 In the Minerals Technical Advice Note (Wales) 1: Aggregates there is no specific guidance regarding buffers/stand-off distances from residential areas and clay mineral extraction sites. However, there are required stand-offs of 100 m from sand and gravel extraction sites and 200 m from hard rock quarries (increased stand-off due to blasting). Clay mineral extraction sites have many similarities with sand and gravel mineral sites so a 100 m stand-off would be appropriate. This stand-off reduces the area for mineral extraction by about half.

5.1.3 The over-head HV electric cable requires a stand-off for health and safety reasons. The electric cable bisects the area of mineral extraction into two parts as can be seen in Figure 5:



- 5.1.4 It is unlikely that it would be economic to work the clay mineral resources shown in grey due to due to the estimated yield being very small and the practical and logistical issues in physically working the materials due to the small and narrow footprints of the two areas. The presence of the relatively thin Made Ground will also reduce viability.
- 5.1.5 It is considered unlikely that the minerals within this site could be economically worked due to:
- Majority of the site cannot be developed and cannot be used for mineral extraction due to ecological and heritage restrictions;
 - The need to maintain a buffer/stand-off from residential development;
 - The need to maintain a buffer/stand-off from the over-head HV cables;
 - There are no active brickworks in the Wrexham area so if the clay was extracted it would have to be transported a considerable distance to an operational brickworks and this would not be economic.
- 5.1.6 The proposed development is predominantly an above ground development with minimal foundations and underground excavation. Therefore the development will not remove excessive volumes of mineral which would largely remain in place beneath the developed and landscape areas after the cut-fill exercise has been carried out. In this regard the minerals are not sterilized from future extraction if, at some point in the future when the proposed development has ceased to operate and structures are removed, they are considered to be a commercially viable source and planning policy at that time allows.

6. CONCLUSION

6.1.1 According to the British Geological Survey Safeguarding Map extract North East Wales (BGS, 2012) the mineral deposit at this site is a Sand and Gravel resource. However, the site specific investigations for the development have shown a geological succession which is generally:

- Topsoil
- Made Ground
- Reworked Clay
- Glacial Till (clay) - to a depth of 12 m

6.1.2 Therefore the mineral resource is a clay which has a lower economic value than sand and gravel. This is recognised by Wrexham Council in the Unitary Development Plan in that proposals for clay extraction will only be permitted where

- a) *the clay is required to meet a national or regional shortage of clay with the specific characteristics of the deposits found in the Wrexham area; or*
- b) *other committed development would prevent clay resources on the same site from being worked.*

Proposals to develop new sites for clay extraction will only be considered favourably when it can be demonstrated that clay extraction proposals that satisfy the other terms of this policy cannot be met by the extension of existing sites.

6.1.3 It is noted that currently that there is no active extraction of clay as a mineral resource in the County other than to create airspace for Hafod landfill.

6.1.4 It is considered unlikely that the minerals within this site could be economically worked due to:

- Majority of the site cannot be developed and cannot be used for mineral extraction due to ecological and heritage restrictions;
- The need to maintain a buffer/stand-off from residential development;
- The need to maintain a buffer/stand-off from the over-head HV cables;
- The estimated yield being very small and the practical and logistical issues in physically working the materials due to the small and narrow footprints of the two areas.
- The presence of the relatively thin Made Ground will also reduce viability.
- There are no active brickworks in the Wrexham area so if the clay was extracted it would have to be transported a considerable distance

- 6.1.5 It is not considered that the proposed development permanently sterilizes or degrades the mineral reserve as the scale of development is considered to be small, the nature of the development does not involve excessive groundworks or excavation, the development use within the safeguarded area is largely habitat areas and landscaping and the scale of the potential mineral reserve is considered to be inaccessible, logistically unworkable and not of sufficient scale to make it commercially viable.
- 6.1.6 Therefore the mineral reserve on site is not practically workable or commercially viable. In addition, the proposed development would not result in loss or sterilisation of the mineral reserve.

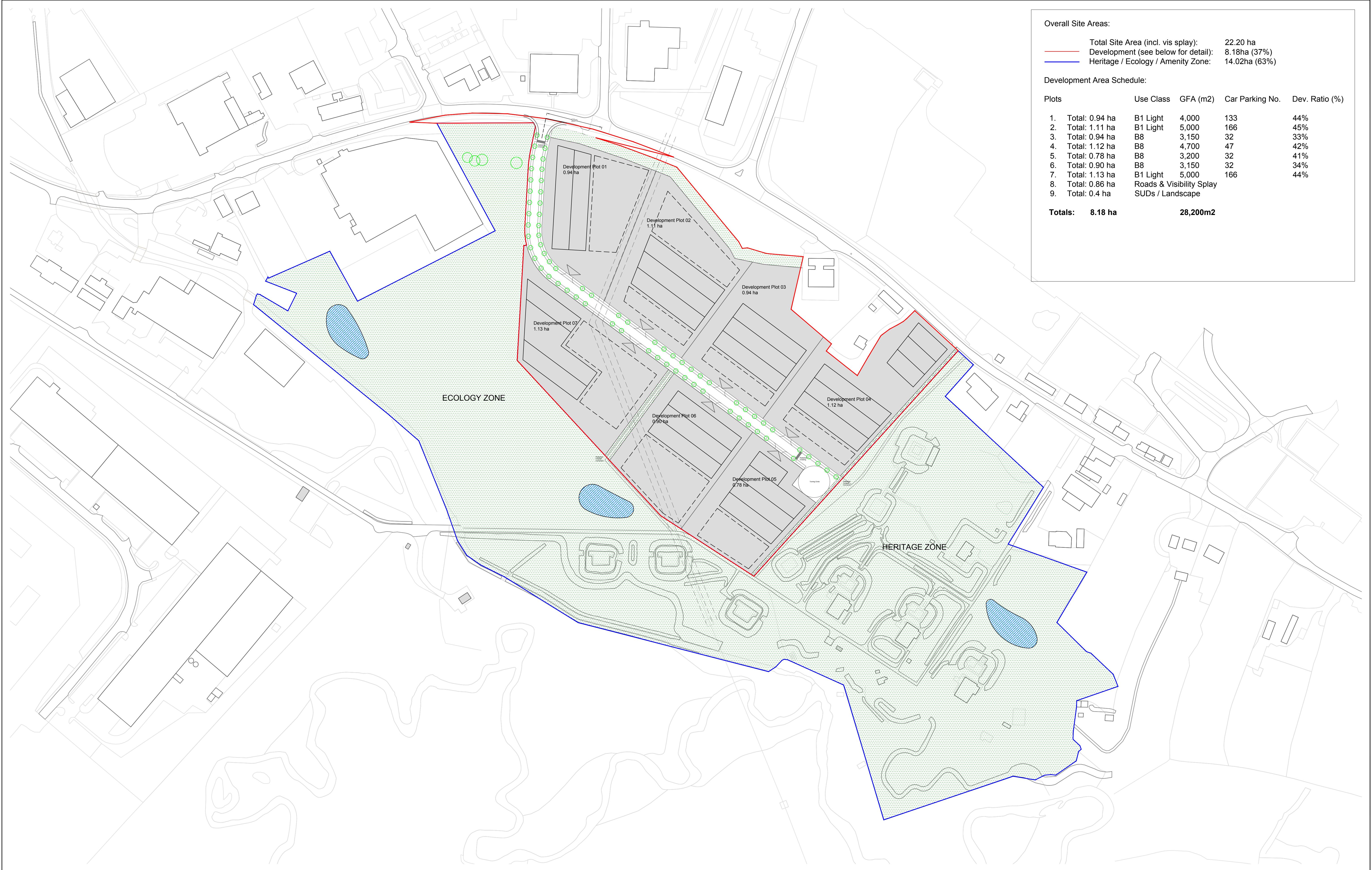
REFERENCES

- British Geological Survey : 2012 : Safeguarding Map extract North East Wales: BGS
Natural Environment Resource Council.
- Welsh Government: 2014 : Minerals Planning Policy (Wales). Minerals Technical Advice
Note (Wales) Part 1: Aggregates. March 2004.
- Welsh Government: 2018 : Planning Policy Wales. Edition 10, December 2018
- Wrexham County Borough Council : Unitary Development Plan 1996-2011.
- Wrexham County Borough Council : Local Development Plan (LDP) for 2013 – 2028
Consultation.

DRAWINGS

List of Drawings

Land Studio 003F	Proposed Development Plan
4292/1/001	Exploratory Hole Exploratory Hole Plan

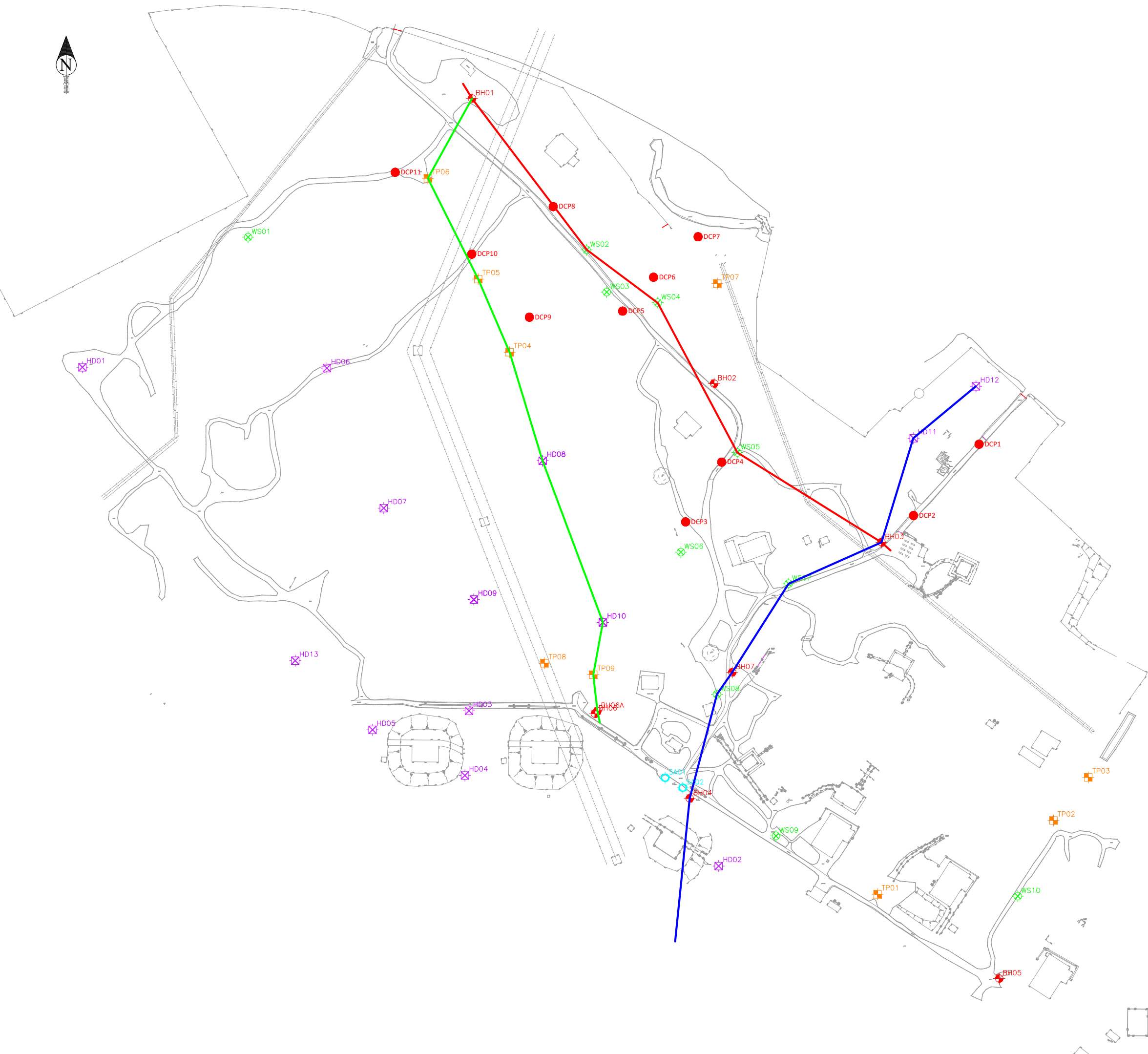


REVISIONS				
Rev.	Description	Date	By	Chk'd
A	Areas revised to incl. Heritage & new jct.	22.03.19	SR	SR
B	Road alignment, Ecology increase, GFA added	26.03.19	SR	SR
C	Areas and site boundaries revised	28.03.19	SR	SR
D	Plots 4 & 5 combined, plot 5 access removed	23.04.19	SR	SR
E	Internal access road minor amends.	03.05.19	SR	SR
F	Footpath connections added, notes added	16.05.19	SR	SR

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PRELIMINARY
client: CEFN PARK DEVELOPMENT LTD
project: THE OAKS
drawing title: PROPOSED SITE PARAMETERS PLAN

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Notes

1. Survey information based on data provided by J 10 Planning. Drawing ref OWI-TCL-VTO-XX-DR-D-0001 TopographicalSurvey.dwg
2. Do not scale
3. All dimensions are in millimetres and all levels are in metres above Ordnance Datum.
4. Any anomalies on this drawing should be brought to the attention of TerraConsult Limited.

Key

-  Borehole
-  Shell and Auger
-  Window Sample
-  Trial Pit
-  Hand Dug
-  Dynamic Cone Penetration
-  Section1
-  Section2
-  Section3

TerraConsult

Bold Business Centre, Bold Lane,
Sutton, St Helens WA9 4TX

Client

Cefn Park
Developments

Site

Oak Road Wrexham

Title

Site Investigation Location
Plan

Scale	1:1,000	@ A1
Drawing No.	4292/1/001	
Rev	Date	Description
A	29/03/19	Additional TPS added HD06 to HD13
File	4292.1.001 SI Location Plan.dwg	
Date	03/19	Engineer JT
Drawn	OS	Checked DRAFT

APPENDICES

List of Appendices

Appendix A	Service Constraints, Report Limitations & Planning Requirements
Appendix B	Exploratory Hole Records

APPENDIX A

Service Constraints, Report Limitations & Planning

Service Constraints, Report Limitations

This consultancy contract, report and the site investigation (together comprise the "Services") were compiled and carried out by TerraConsult Limited (TCL) for Cefn Park Developments and their consultants J10 Planning Ltd (the "client") on the basis of a defined programme and scope of works and the terms of a contract between TCL and the "client." The Services were performed by TCL with all reasonable skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by TCL taking into account the limits of the scope of works required by the client, the prevailing site conditions, the time scale involved and the resources, including financial and manpower resources, agreed between TCL and the client. TerraConsult Ltd cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outwith the agreed scope of works.

Other than that expressly contained in the above paragraph, TCL provides no other representation or warranty whether express or implied, is made in relation to the Services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of TCL. If a third party relies on this report, it does so wholly at its own and sole risk and TCL disclaims any liability to such parties.

It is TCL's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without TCL 's review and advice shall be at the client's sole and own risk.

The information contained in this report is protected by disclosure under Part 3 of the Environmental Information Regulations 2004 pursuant to the provisions of Regulation 12(5) without the consent in writing of a Director of TerraConsult Limited.

The report was written in March 2019 and should be read in light of any subsequent changes in legislation, statutory requirements and industry practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of TCL. In the absence of such written advice of TCL, reliance on the report in the future shall be at the client's own and sole risk. Should TCL be requested to review the report in the future, TCL shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between TCL and the client.

The observations and conclusions described in this report are based solely upon the Services that were provided pursuant to the agreement between the client and TCL. TCL has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report. TCL is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, TCL did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, radon gas or other radioactive or hazardous materials.

The Services are based upon TCL's observations of existing physical conditions at the site gained from a walkover survey of the site together with TCL's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst TerraConsult Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report. Further TCL was not authorised and did not

attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. TCL is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to TCL and including the doing of any independent investigation of the information provided to TCL save as otherwise provided in the terms of the contract between the client and TCL.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site.

APPENDIX B

Exploratory Hole Records

Exploratory Hole Key Sheet

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SAMPLES:

Undisturbed:	
U	Driven tube sample
UT	Thin wall driven tube sample
TW	Pushed thin wall tube sample
P	Pushed piston sample
L	Liner sample (from windowless or similar sampler), full recovery unless otherwise stated
CBR	CBR mould sample
BLK	Block sample
C	Core sample (from rotary core) taken for laboratory testing
Disturbed:	
D	Small sample
B	Bulk sample
AMAL	Amalgamated sample
Environmental:	
ES	Environmental soil sample
EW	Environmental water sample
Comments:	Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that an attempt was made to take a tube sample; however, there was no recovery. Sample recovery is given as a percentage.

TESTS:

SPT S or SPT C	Standard Penetration Test, open shoe (S) or solid cone (C)
	The Standard Penetration Test is defined in BS EN ISO 22476-3 (2005). The incremental blow counts are given in the Field Records column; each increment is 75mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow count beyond the seating drive is given (without the N = prefix).
ICBR	In situ CBR
IV	In situ vane shear strength, peak (p) and remoulded (r), kPa
HV	Hand vane shear strength, peak (p) and remoulded (r), kPa
PP	Pocket penetrometer test, converted to shear strength, kPa
KFH, KRH, KPI	Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value
PID/FID	Photo-ionisation detector/Flame-ionisation detector
	Test results provided in Field Records column

DRILLING RECORDS:

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930: 2015 and BS EN ISO 22575-1 (2006)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented.
NI	Non intact is used where the core is fragmented.
CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss
NR	Not recovered

GROUNDWATER:



Groundwater strike



Groundwater level after standing period

DEPTH REMARKS:

EoS	End of Shift
SoS	Start of Shift
EoBH	End of Borehole

INSTRUMENTATION:

Details of installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill. The type of instrument installed is indicated by a code adjacent to the Legend column at the base of the instrument.

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer
AP	Access pipe
GMP	Gas monitoring standpipe
(xx)	Internal diameter (mm)
ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator
ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
ETR	Rod extensometer

EXPLORATORY HOLE TYPE:

CP	Cable percussion
DP	Dynamic probe
DCP	Dynamic cone penetrometer
HA	Hand auger
IP	Inspection pit
OP	Observation pit/trench
PC	Pavement core
RC	Rotary core
RO	Rotary open hole
SH	Shaft
SNC	Sonic (resonance)
TP	Trial pit/trench
TRAV	Traverse
WLS	Windowless (dynamic) sample
WS	Window (dynamic) sample



Project: **The Oaks, Wrexham**
 Project No: **4292**
 Client: **Cefn Park Developments C/O J10 Planning Ltd**

Reference

KEY SHEET

Sheet 1 of 1

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: CP	From: 0.00	To: 15.00	Start date: 11-02-19	End date: 11-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338662.30	mN: 349460.20	mAOD: 29.62	Grid: OSGB

Backfill/Instal'n	Water-strike	Legend	Level	Depth (thick-ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth	Type & No	Results/Remarks	
			29.52	0.10	Yellowish grey slightly silty sandy GRAVEL of subangular to subrounded fine to medium limestone and concrete. (MADE GROUND)	Dry	1.70	0.30	D1	100 (80%)	
			29.22	0.40	Soft dark brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to medium of shale. (MADE GROUND)			0.30	ES2		
			28.42	1.20	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale (REWORKED CLAY)			1.00	D3		
					1.00			ES4			
					1.20 - 1.65			U5			
			25.62	4.00	Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)			1.70	D6		N=30 (4,6/6,7,8,9)
					(2.80)			1.80	D7		
								2.00 - 2.45	S		
								2.00	D8		
								25.02	4.60		
3.00 - 3.45	U10										
3.50	D11										
3.80	D12										
4.00 - 4.45	S										
25.02	4.60	Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	4.00	D13	N=19 (2,3/4,4,5,6)						
			(6.10)	4.80		D14					
				5.00 - 5.45		U15					
				5.50		D16					
				25.02		4.60	Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	6.00	D17	N=20 (2,3/4,4,5,7)	
6.50 - 6.95	S										
6.50	D18										
7.50	D19										
8.00 - 8.45	U20										
25.02	4.60	Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	8.50	D21	75 (100%)						
			9.00	D22							
			9.50 - 9.95	S							
			9.50	B23							
			25.02	4.60		Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	9.50	S	N=19 (2,3/4,4,5,6)		
(6.10)	9.50	B23									
	9.50	B23									
	9.50	B23									
	9.50	B23									

Inst (D)		Water		Casing	Depth	Type & No	Results	
Groundwater entries:		Diameter & casing:		Depth related remarks:		Chiselling details:		
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 12.00	From: To: Remarks:	From: to: Duration: Tool:

	Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.	Project: The Oaks, Wrexham	Project No: 4292	Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: BH01
Log issue:	DRAFT				
Scale:	1:50				Sheet 1 of 2

Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: CP	From: 0.00	To: 15.00	Start date: 11-02-19	End date: 11-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338662.30 mN: 349460.20 mAOD: 29.62 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			18.92	10.70	Very high strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)			10.50	D24	
					Stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)			11.00 - 11.45	U25	67 (100%)
								11.50	D26	
								12.00	D27	
						Dry	12.00	12.50 - 12.95 12.50	S D28	N=23 (2,3/4,5,7,7)
								13.50	D29	
								14.00 - 14.45	U30	59 (100%)
								14.50	D31	
								15.00	D32	
			14.62	15.00	Borehole ends at 15.00m (Target depth)					

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:	
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 12.00	From:	To:	Remarks:	From:	to: Duration: Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: BH01	
Log issue: DRAFT Scale: 1:50							

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: CP	From: 0.00	To: 15.00	Start date: 12-02-19	End date: 12-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338788.40	mN: 349311.80	mAOD: 29.27	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing						
						Water	Casing	Depth	Type & No	Results/Remarks		
				(0.60)	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.20 0.20	D1 ES2			
			28.67	0.60	Brownish orange slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to medium of oil shale. (MADE GROUND)			1.00 1.00 1.20 - 1.65	D3 ES4 U5	87 (95%)		
			28.47	0.80								
					High strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)			1.70 1.80 2.00 - 2.45 2.00 2.00	D6 D7 S D9 ES8	N=19 (2,3/4,4,5,6)		
						Dry	1.70					
								2.80 3.00 - 3.45	D10 U11	100 (100%)		
								3.50 3.80 4.00 - 4.45 4.00	D12 D13 S D14	N=20 (2,3/4,5,5,6)		
					(6.80)							
								4.80 5.00 - 5.45	D14 U15	100 (85%)		
								5.50 6.00	D16 D17			
								6.50 - 6.95 6.50	S D18	N=25 (2,4/5,5,7,8)		
								7.50	D19			
					21.67	7.60	Medium strength stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (GLACIAL TILL)			8.00 - 8.45	U20	81 (100%)
						(1.30)				8.50	D21	
					20.37	8.90	Firm to stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)			9.00 9.50 - 9.95 9.50	D22 S D23	N=19 (2,3/4,4,5,6)
						Dry	9.00					

	Inst (0)											Water	Casing	Depth	Type & No	Results
--	----------	--	--	--	--	--	--	--	--	--	--	-------	--------	-------	-----------	---------

Groundwater entries:				Diameter & casing:			Depth related remarks:				Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 13.50	From:	To:	Remarks:	From:	to:	Duration:	Tool:	
										5.80	6.00	00:40	Cross	

Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: DRAFT

Scale: 1:50

Project: The Oaks, Wrexham

Project No: 4292

Client: Cefn Park Developments C/O J10 Planning Ltd

Exploratory position reference:

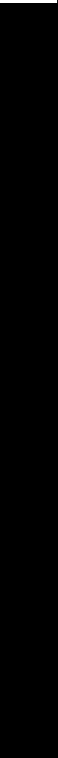
BH02

Sheet 1 of 2

Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: CP	From: 0.00	To: 15.00	Start date: 12-02-19	End date: 12-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338788.40 mN: 349311.80 mAOD: 29.27 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			17.47	(2.90)	Firm to stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is angular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)	Dry	12.00	10.50	D24	67 (100%)
								11.00 - 11.45	U25	
								11.50	D26	
								12.00	D27	
				11.80	Stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (GLACIAL TILL)			12.50 - 12.95 12.50	S D28	N=18 (2,3/4,4,5,5)
								13.50	D29	63 (85%)
								14.00 - 14.45	U30	
								14.50	D31	
								15.00	D32	
			14.27	15.00	Borehole ends at 15.00m (Target depth)					

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:	
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 13.50	From:	To:	Remarks:	From:	to: Duration: Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: BH02	
Log issue: DRAFT Scale: 1:50							

TerraConsult

Sheet 1 of 2

Borehole Log

TerraConsult

Borehole formation details:												Location details:	
Type: CP	From: 0.00	To: 15.00	Start date: 13-02-19	End date: 13-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE:	338875.60
												mN:	349229.20
												mAOD:	29.63
												Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth	Type & No	Results/Remarks	
				(5.70)	High strength stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry	12.00	10.50	D26	87 (100%)	
								11.00 - 11.45	U27		
								11.50	D28		
								12.00	D29		
								12.50 - 12.95 12.50	S D30		N=19 (2,3/4,4,5,6)
								13.50	D31		
								14.00 - 14.45	U32		77 (100%)
								14.50	D33		
								15.00	D34		

	Inst (Ø)									Water	Casing	Depth	Type & No	Results	
Groundwater entries:				Diameter & casing:			Depth related remarks:					Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:			From:	to:	Duration:	Tool:
				150	15.00	13.50									

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres. Log issue: DRAFT Scale: 1:50	Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: BH03 Sheet 2 of 2
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TerraConsult

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth	Type & No	Results/Remarks	
			24.56	(0.40)	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)	Dry	1.70	0.30	D1	87 (85%)	
				0.40				0.30			ES2
			(1.80)	High strength firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (REWORKED CLAY)	1.00			D3			
					1.00				ES4		
			(1.80)		1.20 - 1.65			U5			
					1.70			D6			
			1.80	D7							
			22.76	2.20	High strength stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)			2.00 - 2.45	S		N=16 (2,2/3,4,4,5)
								2.00			
								2.00	ES8		
								2.80	D10		
			3.00 - 3.45	U11	53 (85%)						
			3.50	D12							
			3.80		D13						
			4.00 - 4.45	S				N=16 (2,2/3,3,5,5)			
			4.00		D14						
			4.80	D15							
			5.00 - 5.45		U16			68 (100%)			
			5.50	D17							
			6.00		D18						
			6.50 - 6.95	S				N=19 (2,3/4,4,5,6)			
			6.50		D19						
			(10.50)					7.50	D20		
								8.00 - 8.45			U21
8.50	D22										
9.00		D23									
9.50 - 9.95	S		N=16 (2,2/3,4,4,5)								
9.50		D24									

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres. Log issue: DRAFT Scale: 1:50	Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: BH04 Sheet 1 of 2
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Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: CP	From: 0.00	To: 15.00	Start date: 14-02-19	End date: 14-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338775.70 mN: 349095.80 mAOD: 24.96 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			12.26	12.70	High strength stiff brown slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium of sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry	12.00	10.50	D25	77 (95%)
								11.00 - 11.45	U26	
								11.50	D27	
								12.00	D28	
								12.50 - 12.95 12.50	S D29	N=21 (2,3/4,5,5,7)
								13.50	D30	100 (90%)
								14.00 - 14.45	U31	
								14.50	D32	
								15.00	D33	
			(2.30)		Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)					
			9.96	15.00	Borehole ends at 15.00m (Target depth)					

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:	
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 12.00	From:	To:	Remarks:	From:	to: Duration: Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: BH04	
Log issue: DRAFT Scale: 1:50							

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: CP	From: 0.00	To: 15.00	Start date: 18-02-19	End date: 18-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338936.90	mN: 349002.10	mAOD: 25.28	Grid: OSGB

Backfill/Instal'n	Water-strike	Legend	Level	Depth (thick-ness)	Stratum Description	Samples & In Situ Testing								
						Water	Casing	Depth	Type & No	Results/Remarks				
			25.13	0.15	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)	Dry	1.70	0.30	D1	82 (85%)				
			(1.65)	0.30	ES2									
				1.00	D3									
				1.00	ES4									
				1.20 - 1.65	U5									
				23.48	1.80			Medium strength firm light brown slightly sandy slightly gravelly (REWORKED CLAY)	1.70		D6			
			(51)	SP	(12.00)			Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry		4.00	1.80	D7	N=14 (1,2/2,3,4,5)
												2.00 - 2.45	S	
												2.00	D8	
												2.00	ES7	
												2.80	D9	
												3.00	ES9	
3.00 - 3.45	U10													
3.50	D11													
3.80	D12													
4.00 - 4.45	S	N=16 (2,2/3,4,4,5)												
4.00	D13													
4.80	D14													
5.00 - 5.45	U15		73 (100%)											
(51)	SP	(12.00)	Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry	6.00	5.50	D16	N=20 (2,3/4,4,5,7)						
						5.80	D17							
						6.00	D18							
						6.50 - 6.95	S							
						7.50	D19							
						8.00 - 8.45	U20		76 (100%)					
						8.50	D21							
						9.00	D22							
(51)	SP	(12.00)	Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry	9.00	9.50 - 9.95	S	N=22 (2,3/4,5,6,7)						
						9.50	D23							

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 12.00	From:	To:	Remarks:	From: 1.70	to: 1.90	Duration: 00:30	Tool: Cross
										2.50	2.60	00:40	Cross



Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in metres.

Log issue: DRAFT

Scale: 1:50

Project: The Oaks, Wrexham

Project No: 4292

Client: Cefn Park Developments C/O J10 Planning Ltd

Exploratory position reference:

BH05

Sheet 1 of 2

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: CP	From: 0.00	To: 15.00	Start date: 18-02-19	End date: 18-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338936.90	mN: 349002.10	mAOD: 25.28	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			11.48	13.80	Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)	Dry	12.00	10.50	D24	88 (100%)
								11.00 - 11.45	U25	
			10.28	15.00	Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)			11.50	D26	N=24 (2,3/4,5,7,8)
								12.00	D27	
				(1.20)	Borehole ends at 15.00m (Target depth)			12.50 - 12.95 12.50	S D28	100 (90%)
								13.50	D29	
								14.00 - 14.45	U30	
								14.50	D31	
								15.00	D32	

Inst (Ø)						Water	Casing	Depth	Type & No	Results
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Groundwater entries:				Diameter & casing:			Depth related remarks:				Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 12.00	From:	To:	Remarks:	From:	to:	Duration:	Tool:	

	Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.										Project: The Oaks, Wrexham				Exploratory position reference: BH05			
	Log issue: DRAFT										Project No: 4292							
	Scale: 1:50										Client: Cefn Park Developments C/O J10 Planning Ltd							

Sheet 2 of 2

Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: CP	From: 0.00	To: 2.00	Start date: 19-02-19	End date: 19-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338726.30 mN: 349139.90 mAOD: 25.20 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			25.00	0.20	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.30	D1	
					Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (REWORKED CLAY)			0.30	ES2	
				(1.78)				1.00 1.00 1.20 1.20 - 1.65	D3 ES4 B5 U4	100 (0%)
			23.22	1.98	CONCRETE	Dry	1.70	1.80	D6	
			23.20	2.00	(MADE GROUND)				S	50 (25 for 18mm/50 for 22mm)
					Borehole ends at 2.00m (Concrete obstruction)					

Inst (Ø)									Water	Casing	Depth	Type & No	Results	
Groundwater entries:				Diameter & casing:			Depth related remarks:				Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:	
				150	15.00	1.70					1.30	1.50	00:40	Cross
											2.00	2.00	00:15	Cross

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: BH06	
Log issue: DRAFT Scale: 1:50							

TerraConsult

Backfill/ Install'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			24.94	0.20	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)					
					Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (REWORKED CLAY)					
				(2.00)						
			22.94	2.20	Medium strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)					
								2.80	D1	
								3.00 - 3.45	U2	71 (100%)
								3.50	D3	
								3.80	D4	
						Dry	4.00	4.00 - 4.45	S	N=19 (2,3/4,4,5,6)
								4.00	D5	
								4.80	D6	
								5.00 - 5.45	U7	59 (100%)
								5.50	D8	
								6.00	D9	
						Dry	6.00	6.50 - 6.95	S	N=18 (2,3/4,4,5,5)
								6.50	D10	
				(9.80)				7.50	D11	
								8.00 - 8.45	U12	62 (85%)
					8.00 m: Becomes high strength			8.50	D13	
								9.00	D14	
						Dry	9.00	9.50 - 9.95	S	N=16 (2,2/3,4,4,5)
								9.50	B15	

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres. Log issue: DRAFT Scale: 1:50	Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: BH06A Sheet 1 of 2
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TerraConsult

Sheet 2 of 2

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: CP	From: 0.00	To: 15.00	Start date: 20-02-19	End date: 20-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338797.80	mN: 349161.50	mAOD: 26.00	Grid: OSGB

Backfill/Instal'n	Water-strike	Legend	Level	Depth (thick-ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			25.85	0.15	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)	Dry	1.70	0.30	D1	79 (100%)
			25.60	0.40	Firm light brown slightly sandy slightly CLAY. Gravel is subangular to subrounded fine to medium of shale and concrete. (REWORKED CLAY)			0.30	ES2	
			(51)	High strength stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	1.00			D3	N=19 (2,3/4,4,5,6)	
					1.00			ES4		
					1.20 - 1.65			U5		
					1.70			D6		
			(8.25)		1.80			D7	N=18 (2,3/4,4,5,5)	
					2.00 - 2.45			S		
					2.00			D8		
					2.80			D9		
					3.00 - 3.45			U10	83 (100%)	
					3.50			D11		
					3.80			D12		
					4.00 - 4.45			S		
					4.00			D13	N=21 (2,3/4,5,5,7)	
4.80	D14									
5.00 - 5.45	U15									
5.50	D16									
		6.00	D17	87 (100%)						
		6.50 - 6.95	S							
		6.50	D18							
		7.50	D19							
		8.00 - 8.45	U20	N=15 (2,2/3,3,4,5)						
		8.50	D21							
		9.00	D22							
		9.50 - 9.95	S							
		9.50	D23							
		17.30	8.70	Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)						

Inst (0)		Water	Casing	Depth	Type & No	Results				
Groundwater entries:		Diameter & casing:		Depth related remarks:		Chiselling details:				
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 13.50	From: 4.60	to: 4.80	Duration: 00:30	Tool: Cross
AGS Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham		Exploratory position reference:		BH07				
Log issue: DRAFT		Project No: 4292		Client: Cefn Park Developments C/O J10 Planning Ltd		Sheet 1 of 2				
Scale: 1:50										

Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: CP	From: 0.00	To: 15.00	Start date: 20-02-19	End date: 20-02-19	Crew: SL	Plant: Dando 2000	Barrel type: N/A	Drill Bit: N/A	Logged:	Logger: GB	Remarks:	mE: 338797.80 mN: 349161.50 mAOD: 26.00 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
					Medium strength firm brown mottled grey slightly sandy slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to medium sandstone, siltstone and mudstone. (GLACIAL TILL)			10.50	D24	
								11.00 - 11.45	U25	66 (100%)
								11.50	D26	
								12.00	D27	
						Dry	12.00	12.50 - 12.95 12.50	S D28	N=16 (2,2/3,4,4,5)
								13.50	D29	
								14.00 - 14.45	U30	67 (100%)
								14.50	D31	
								15.00	D32	
					Borehole ends at 15.00m (Target depth)					

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:	
Struck:	Rose to:	Casing:	Sealed:	Dia (mm): 150	Depth: 15.00	Casing: 13.50	From:	To:	Remarks:	From:	to: Duration: Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: BH07	
Log issue: DRAFT Scale: 1:50							

TerraConsult

Sheet 1 of 1

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 18-02-19	End date: 18-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338722.00	mN: 349381.40	mAOD: 29.55	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			29.25	(0.30) 0.30	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.40	ES	
			28.65	(0.60) 0.90	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (REWORKED CLAY)			1.00	ES	
					Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=10 (1,1/2,2,3,3)
						Dry		2.00 - 2.45	S	N=19 (2,3/3,5,5,6)
						Dry		3.00 - 3.45	S	N=31 (3,4/7,7,7,10)
					Dry		4.00 - 4.45	S	N=42 (6,8/9,10,11,12)	
			25.10	4.45	Borehole ends at 4.45m (Target depth)					

Inst (Ø)						Water	Casing	Depth	Type & No	Results			
Groundwater entries:		Diameter & casing:		Depth related remarks:				Chiselling details:					
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.	Project: The Oaks, Wrexham	Exploratory position reference: WS02
Log issue: DRAFT	Project No: 4292	
Scale: 1:50	Client: Cefn Park Developments C/O J10 Planning Ltd	

Sheet 1 of 1

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338732.50	mN: 349359.40	mAOD: 29.95	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
	(51)		29.80	0.15	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.50	ES	
			(1.85)			Dry	1.20 - 1.65	S	N=11 (1,2/3,3,3,2)	
					1.50	ES				
					2.00	2.00 - 2.45	S	N=16 (1,1/2,3,4,7)		
					2.50	2.50	ES			
		2.75	2.75							
		2.95	2.95							
		3.15	3.15							
		3.35	3.35							
		3.55	3.55							
		3.75	3.75							
		3.95	3.95							
		4.15	4.15							
		4.35	4.35							
		4.55	4.55							
		4.75	4.75							
		4.95	4.95							
		5.15	5.15							
		5.35	5.35							
		5.55	5.55							
		5.75	5.75							
		5.95	5.95							
		6.15	6.15							
		6.35	6.35							
		6.55	6.55							
		6.75	6.75							
		6.95	6.95							
		7.15	7.15							
		7.35	7.35							
		7.55	7.55							
		7.75	7.75							
		7.95	7.95							
		8.15	8.15							
		8.35	8.35							
		8.55	8.55							
		8.75	8.75							
		8.95	8.95							
		9.15	9.15							
		9.35	9.35							
		9.55	9.55							
		9.75	9.75							
		9.95	9.95							
		10.15	10.15							
		10.35	10.35							
		10.55	10.55							
		10.75	10.75							
		10.95	10.95							
		11.15	11.15							
		11.35	11.35							
		11.55	11.55							
		11.75	11.75							
		11.95	11.95							
		12.15	12.15							
		12.35	12.35							
		12.55	12.55							
		12.75	12.75							
		12.95	12.95							
		13.15	13.15							
		13.35	13.35							
		13.55	13.55							
		13.75	13.75							
		13.95	13.95							
		14.15	14.15							
		14.35	14.35							
		14.55	14.55							
		14.75	14.75							
		14.95	14.95							
		15.15	15.15							
		15.35	15.35							
		15.55	15.55							
		15.75	15.75							
		15.95	15.95							
		16.15	16.15							
		16.35	16.35							
		16.55	16.55							
		16.75	16.75							
		16.95	16.95							
		17.15	17.15							
		17.35	17.35							
		17.55	17.55							
		17.75	17.75							
		17.95	17.95							
		18.15	18.15							
		18.35	18.35							
		18.55	18.55							
		18.75	18.75							
		18.95	18.95							
		19.15	19.15							
		19.35	19.35							
		19.55	19.55							
		19.75	19.75							
		19.95	19.95							
		20.15	20.15							
		20.35	20.35							
		20.55	20.55							
		20.75	20.75							
		20.95	20.95							
		21.15	21.15							
		21.35	21.35							
		21.55	21.55							
		21.75	21.75							
		21.95	21.95							
		22.15	22.15							
		22.35	22.35							
		22.55	22.55							
		22.75	22.75							
		22.95	22.95							
		23.15	23.15							
		23.35	23.35							
		23.55	23.55							
		23.75	23.75							
		23.95	23.95							
		24.15	24.15							
		24.35	24.35							
		24.55	24.55							
		24.75	24.75							
		24.95	24.95							
		25.15	25.15							
		25.35	25.35							
		25.55	25.55							
		25.75	25.75							
		25.95	25.95							
		26.15	26.15							
		26.35	26.35							
		26.55	26.55							
		26.75	26.75							
		26.95	26.95							
		27.15	27.15							
		27.35	27.35							
		27.55	27.55							
		27.75	27.75							
		27.95	27.95							
		28.15	28.15							
		28.35	28.35							
		28.55	28.55							
		28.75	28.75							
		28.95	28.95							
		29.15	29.15							
		29.35	29.35							
		29.55	29.55							
		29.75	29.75							
		29.95	29.95							
		30.15	30.15							
		30.35	30.35							
		30.55	30.55							
		30.75	30.75							
		30.95	30.95							
		31.15	31.15							
		31.35	31.35							
		31.55	31.55							
		31.75	31.75							
		31.95	31.95							
		32.15	32.15							
		32.35	32.35							
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		32.95	32.95							
		33.15	33.15							
		33.35	33.35							
		33.55	33.55							
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		33.95	33.95							
		34.15	34.15							
		34.35	34.35							
		34.55	34.55							
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		35.95	35.95							
		36.15	36.15							
		36.35	36.35							
		36.55	36.55							
		36.75	36.75							
		36.95	36.95							
		37.15	37.15							
		37.35	37.35							
		37.55	37.55							
		37.75	37.75							
		37.95	37.95							
		38.15	38.15							
		38.35	38.35							
		38.55	38.55							
		38.75	38.75							
		38.95	38.95							
		39.15	39.15							
		39.35	39.35							
		39.55	39.55							
		39.75	39.75							
		39.95	39.95							
		40.15	40.15							
		40.35	40.35							

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338759.00	mN: 349354.00	mAOD: 30.81	Grid: OSGB

Backfill/Instal'n	Water-strike	Legend	Level	Depth (thick-ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			30.71	0.10	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.20	ES	
			30.46	0.35	Brownish orange slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to medium of oil shale. (MADE GROUND)			0.40	ES	
					Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (MADE GROUND)	Dry		1.20 - 1.65	S	N=14 (1,2/2,3,4,5)
						Dry		2.00 - 2.45	S	N=34 (6,6/9,9,9,7)
						Dry		3.00 - 3.45	S	N=34 (6,5/7,8,9,10)
								3.80	D	
								4.00 - 4.45	S	N=36 (6,6/7,7,10,12)
			26.36	4.45	Borehole ends at 4.45m (Target depth)					

Inst (Ø)				Water	Casing	Depth	Type & No	Results					
Groundwater entries:				Diameter & casing:		Depth related remarks:		Chiselling details:					
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:

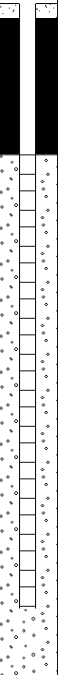
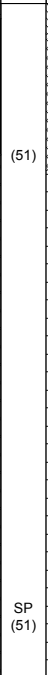
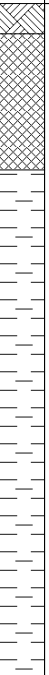
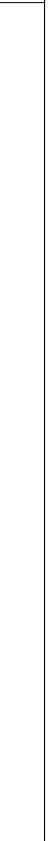
Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.	Project: The Oaks, Wrexham	Exploratory position reference: WS04
Log issue: DRAFT	Project No: 4292	
Scale: 1:50	Client: Cefn Park Developments C/O J10 Planning Ltd	

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Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338800.50 mN: 349275.90 mAOD: 28.98 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			28.78	0.20	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.10	ES	
			(0.90)		Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (MADE GROUND)			0.40	ES	
			27.88	1.10	Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=17 (4,4/3,5,4,5)
			(3.35)					1.50	ES	
						Dry		2.00 - 2.45	S	N=25 (4,5/5,6,6,8)
								3.00 - 3.45	S	N=24 (4,5/5,5,6,8)
						Dry		4.00 - 4.45	S	N=25 (5,5/5,6,6,8)
			24.53	4.45	Borehole ends at 4.45m (Target depth)					

Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:	
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to: Duration: Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd				Exploratory position reference: WS05	
Log issue: DRAFT Scale: 1:50							

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338771.10	mN: 349224.10	mAOD: 29.30	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing									
						Water	Casing	Depth	Type & No	Results/Remarks					
	(51)		29.10	0.20	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.10	ES						
			(0.80)	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (MADE GROUND)			0.50	ES							
			28.30	1.00	Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=17 (1,2/2,3,5,7)					
						Dry		2.00 - 2.45	S	N=29 (4,5/5,8,8,8)					
						Dry		2.50	D						
			(3.45)			Dry		3.00 - 3.45	S	N=27 (4,4/5,6,7,9)					
						Dry		4.00 - 4.45	S	N=23 (5,5/4,6,6,7)					
			24.85	4.45	Borehole ends at 4.45m (Target depth)										

Inst (Ø)				Water	Casing	Depth	Type & No	Results
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Groundwater entries:				Diameter & casing:			Depth related remarks:			Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:

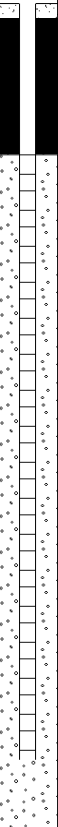
	Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.	Project: The Oaks, Wrexham	Project No: 4292	Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: WS06
Log issue:	DRAFT				
Scale:	1:50				

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Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 5.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338827.20	mN: 349207.60	mAOD: 28.00	Grid: OSGB

Backfill/Instal'n	Water-strike	Legend	Level	Depth (thickness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
	(51)		27.90	0.10	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.20	ES	
			27.50	0.50	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale and concrete. (MADE GROUND)			0.60	ES	
					Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=15 (2,2/4,4,4,3)
						Dry		2.00 - 2.45	S	N=13 (1,2/3,3,3,4)
					2.50	D				
					3.00 - 3.45	S	N=22 (3,4/5,6,5,6)			
					4.00 - 4.45	S	N=29 (4,4/5,7,7,10)			
					4.50	D				
					5.00 - 5.45	S	N=29 (4,5/6,7,7,9)			
					22.55	5.45	Borehole ends at 5.45m (Target depth)			

Inst (Ø)						Water	Casing	Depth	Type & No	Results			
Groundwater entries:						Diameter & casing:		Depth related remarks:		Chiselling details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres. Log issue: DRAFT Scale: 1:50	Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd	Exploratory position reference: WS07
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Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338789.90	mN: 349150.10	mAOD: 25.85	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			25.70	0.15 (0.30)	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.10	ES	
			25.40	0.45	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale and concrete. (MADE GROUND)			0.30	ES	
					Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=15 (2,2/3,4,3,5)
								1.50	ES	
						Dry		2.00 - 2.45	S	N=18 (3,3/4,4,5,5)
						Dry		3.00 - 3.45	S	N=20 (3,4/4,5,5,6)
						Dry		4.00 - 4.45	S	N=26 (3,4/5,7,6,8)
				21.40	4.45	Borehole ends at 4.45m (Target depth)				

Inst (Ø)						Water	Casing	Depth	Type & No	Results			
Groundwater entries:			Diameter & casing:			Depth related remarks:			Chiselling details:				
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:
				Project: The Oaks, Wrexham						Exploratory position reference:			
Log issue: DRAFT				Project No: 4292						WS08			
Scale: 1:50				Client: Cefn Park Developments C/O J10 Planning Ltd									
												Sheet 1 of 1	

Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338820.60	mN: 349076.40	mAOD: 25.02	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing									
						Water	Casing	Depth	Type & No	Results/Remarks					
	(51)		24.97	0.05	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.40	ES						
			24.22	0.80	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale and concrete. (MADE GROUND)			1.00	ES						
					Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=5 (2,2/2,1,1,1)					
						Dry		2.00 - 2.45	S	N=26 (3,5/5,6,7,8)					
						Dry		3.00 - 3.45	S	N=22 (3,4/4,6,5,7)					
						Dry		4.00 - 4.45	S	N=23 (3,3/4,6,6,7)					
			20.57	4.45	Borehole ends at 4.45m (Target depth)										

Inst (Ø)						Water	Casing	Depth	Type & No	Results			
Groundwater entries:		Diameter & casing:		Depth related remarks:				Chiselling details:					
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From:	to:	Duration:	Tool:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.	Project: The Oaks, Wrexham	Exploratory position reference: WS09
Log issue: DRAFT	Project No: 4292	
Scale: 1:50	Client: Cefn Park Developments C/O J10 Planning Ltd	

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Borehole Log

TerraConsult

Borehole formation details:												Location details:			
Type: WLS	From: 0.00	To: 4.45	Start date: 19-02-19	End date: 19-02-19	Crew: JR	Plant: Archway Dart	Barrel type:	Drill Bit:	Logged:	Logger: GB	Remarks:	mE: 338946.60	mN: 349044.90	mAOD: 28.07	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results/Remarks
			27.92	0.15	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)			0.20	ES	
			27.77	0.30	Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale and concrete. (MADE GROUND)			0.50	ES	
					Stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone. (GLACIAL TILL)	Dry		1.20 - 1.65	S	N=15 (2,2/3,3,4,5)
						Dry		2.00 - 2.45 2.00	S ES	N=17 (3,3/4,3,5,5)
						Dry		3.00 - 3.45	S	N=25 (4,5/5,7,5,8)
					Dry		4.00 - 4.45	S	N=25 (5,5/6,6,5,8)	
			23.62	4.45	Borehole ends at 4.45m (Target depth)					

Inst (Ø)						Water	Casing	Depth	Type & No	Results			
Groundwater entries:			Diameter & casing:			Depth related remarks:			Chiselling details:				
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	To:	Remarks:	From: to: Duration: Tool:			
				Project: The Oaks, Wrexham						Exploratory position reference:			
Log issue: DRAFT				Project No: 4292						WS10			
Scale: 1:50				Client: Cefn Park Developments C/O J10 Planning Ltd									
												Sheet 1 of 1	

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Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:
Logged by:	GB	Method:	Machine excavated	Width: 0.93	mE: 338681.90	Start: 13/02/2019
Checked by:		Plant:	9T tracked excavator	Length: 2.60	mN: 349328.10	End: 13/02/2019
		Shoring:	None	Orientation:	mAOD: 28.61	Logged:
				Bearing = 110	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			(2.70)	Soft dark brown slightly sandy slightly gravelly CLAY with a low cobble content of subangular brick. Gravel is angular to subrounded fine to medium sandstone, mudstone, shale and rare coal. (MADE GROUND) <i>0.50 m: Becoming firm</i>	0.80	ES	
			25.91 2.70 (0.30)	Brownish orange slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to medium of oil shale and brick. (MADE GROUND)	2.50	ES	
			25.61 3.00	Stiff brown mottled grey CLAY. (GLACIAL TILL)	2.80	ES	
			25.41 3.20	Trial pit ends at 3.20m			

Groundwater entries:		Depth related remarks:		General remarks:	
Depth:	Rose to:	Remarks:	From to: Remarks:	Weather:	Stability:
				Remarks:	
 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd		Exploratory position reference: TP04	
Log issue: DRAFT Scale: 1:25				Sheet 1 of 1	

TerraConsult

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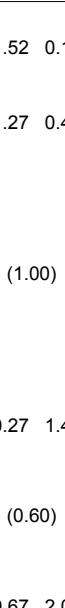
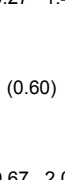
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Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:
Logged by:	GB	Method:	Machine excavated	Width: 0.92	mE: 338790.10	Start: 14/02/2019
Checked by:		Plant:	9T tracked excavator	Length: 2.35	mN: 349363.80	End: 14/02/2019
		Shoring:	None	Orientation:	mAOD: 31.67	Logged:
				Bearing = 88	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			31.52 0.15	Dark brown gravelly slightly clayey fine to coarse SAND with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (MADE GROUND)	0.10	ES	
			31.27 0.40	Brownish orange slightly silty sandy GRAVEL. Gravel is angular to subrounded fine to medium of shale and rare clinker. (MADE GROUND)	0.30	ES	
			(1.00)	Soft light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of shale. (MADE GROUND)			
				1.00 m: Becoming firm	1.20	ES	
			30.27 1.40	Stiff brown mottled grey CLAY. (GLACIAL TILL)			
			(0.60)				
			29.67 2.00	Trial pit ends at 2.00m			

Groundwater entries:		Depth related remarks:		General remarks:	
Depth:	Rose to: Remarks:	From to: Remarks:		Weather:	
				Stability:	
				Remarks:	
 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham Project No: 4292 Client: Cefn Park Developments C/O J10 Planning Ltd		Exploratory position reference: TP07	
Log issue: DRAFT Scale: 1:25				Sheet 1 of 1	

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Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:
Logged by:	GB	Method:	Machine excavated	Width: 0.97	mE: 338725.50	Start: 14/02/2019
Checked by:		Plant:	9T tracked excavator	Length: 2.38	mN: 349160.20	End: 14/02/2019
		Shoring:	None	Orientation:	mAOD: 25.71	Logged:
				Bearing = 44	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			25.61 0.10	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale. (TOPSOIL)	0.20	ES	
			(1.00)	Soft orangish brown slightly sandy CLAY. Gravel is subangular to subrounded fine to medium limestone and rare shale. (MADE GROUND)			
			24.61 1.10	Stiff brown mottled grey CLAY. (GLACIAL TILL)			
			23.71 2.00	Trial pit ends at 2.00m			

Groundwater entries:		Depth related remarks:		General remarks:
Depth:	Rose to:	Remarks:		Weather:
				Stability:
				Remarks:



TP01





TP02





TP03





TP04





TP05





TP06





TP07





TP08

Trial Pit Log

TerraConsult

Personnel:		Equipment & methods:		Dimensions:	Coordinates & level:	Dates:
Logged by:		Method: Hand excavated trial pit		Width:	mE: 338459.40	Start: 18/02/2019
Checked by:		Plant:		Length:	mN: 349320.30	End: 18/02/2019
		Shoring:		Orientation:	mAOD: 26.62	Logged:
				Bearing =	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			26.52 0.10	Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of shale and rare clinker. (TOPSOIL)	0.30	ES32	
			(1.20)	Brown slightly sandy gravelly CLAY. Gravel fine to coarse subangular to subrounded of sandstone and mudstone. (REWORKED CLAY)			
			25.32 1.30	Trial pit ends at 1.30m (Target depth)			

Groundwater entries:		Depth related remarks:		General remarks:
Depth:	Rose to: Remarks:	From to: Remarks:		Weather:
				Stability:
				Remarks:

Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: The Oaks, Wrexham	Exploratory position reference: HD01
Log issue:	DRAFT	Project No: 4292	
Scale:	1:25	Client: Cefn Park Developments C/O J10 Planning Ltd	

TerraConsultSheet 1 of 1

TerraConsult

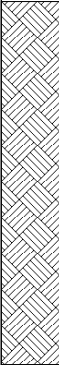
Personnel:	Equipment & methods:	Dimensions:	Coordinates & level:	Dates:
Logged by:	Method: Hand excavated trial pit	Width:	mE: 338660.70	Start: 18/02/2019
Checked by:		Length:	mN: 349141.50	End: 18/02/2019
	Plant:	Orientation:	mAOD: 24.94	Logged:
	Shoring:	Bearing =	Grid: OSGB	

[illegible]

Groundwater entries: Depth: Rose to: Remarks:	Depth related remarks: From to: Remarks:	General remarks: Weather: Stability: Remarks:
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TerraConsult

Personnel:	Equipment & methods:	Dimensions:	Coordinates & level:	Dates:
Logged by:	Method: Hand excavated trial pit	Width:	mE: 338658.60	Start: 18/02/2019
Checked by:		Length:	mN: 349107.80	End: 18/02/2019
	Plant:	Orientation:	mAOD: 25.54	Logged:
	Shoring:	Bearing =	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			25.34 0.20	Black and brown slightly clayey SAND. Abundant rootlets. (TOPSOIL)	0.20	ES32	
			(1.00)	Stiff orangish brown slightly gravelly CLAY. Gravel fine to medium subrounded to rounded of mudstone and sandstone. (REWORKED CLAY)			
			24.34 1.20	Trial pit ends at 1.20m (Target depth)			

Groundwater entries: Depth: Rose to: Remarks:	Depth related remarks: From to: Remarks:	General remarks: Weather: Stability: Remarks:
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Personnel:	Equipment & methods:	Dimensions:	Coordinates & level:	Dates:
Logged by:	Method: Hand excavated trial pit	Width:	mE: 338610.50	Start: 18/02/2019
Checked by:		Length:	mN: 349131.60	End: 18/02/2019
	Plant:	Orientation:	mAOD: 23.92	Logged:
	Shoring:	Bearing =	Grid: OSGB	

Backfill/ Instal'n	Water- strike	Legend	Level & Depth (Thickness)	Stratum Description	Samples & In Situ Testing		
					Depth	Type & No	Results
			0.00 0.30	Black and brown slightly clayey SAND. Abundant rootlets. (TOPSOIL)	0.30	ES32	
			23.62 0.30	Stiff orangish brown slightly gravelly CLAY. Gravel fine to coarse subrounded to rounded of mudstone. (REWORKED CLAY)			
			0.30 1.00				
			22.62 1.30	Trial pit ends at 1.30m (Target depth)			
					Depth	Type & No	Results

Groundwater entries:	Depth related remarks:	General remarks:
Depth: Rose to: Remarks:	From to: Remarks:	Weather:
		Stability:
		Remarks:



HD01





HD02





HD03





HD04





HD05





TerraConsult

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