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Project CAE NANT TERRACE, SKEWEN – COVER THICKNESS REPORT	
Client	Castell Group

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1.0 INTRODUCTION

1.1 Introduction

Spectrum Geo Services (SGS) were requested by Castell Group, to undertake a BRE Cover Thickness Assessment of a site at Cae Nant Terrace, Skewen. A previous trial pitting exercise and window sampling exercise had been undertaken, and was reported as 2094/R1, September 2020. The reports should be read in conjunction with each other.

2094/R1 found elevated values of Arsenic and Lead within the soils and thus a BRE Cover Thickness Assessment was recommended..

1.2 Scope of Works

The objectives of this assessment are to report on:

- Site cover thicknesses – Capping.

1.3 Development Proposals

It is understood that the intention is to develop the site for the purposes of Residential use.

1.4 Limitations

Subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent from the data available for review.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any regulatory authorities for approval. Redevelopment sites may have planning conditions attached in respect of contaminated land assessment. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to the regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all of the regulatory authority requirements.

2.0 EXISTING SITE INFORMATION

2.1 Site Location

The development site is situated on Cae Nant Terrace, Skewen, Swansea, SA10 6UP. The site location plan is included in as Drawing 2094/01, **Appendix A**.

The existing site is roughly rectangular and has previously been developed, with former buildings and rough unmetalled areas.

2.2 Published Geology

Based on data available from the BGS webviewer, the following geological setting is anticipated;

- **Superficial deposits:**
- 1:50,000 scale superficial deposits description: Till, Devensian - Diamicton. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (U).
- Setting: ice age conditions (U). These sedimentary deposits are glacial in origin. They are detrital, created by the action of ice and meltwater, they can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods during the Quaternary.
- **Solid Geology:**
- 1:50,000 scale bedrock geology description: Hughes Member - Sandstone. Sedimentary Bedrock formed approximately 308 to 310 million years ago in the Carboniferous Period. Local environment previously dominated by rivers.
- Setting: rivers. These sedimentary rocks are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

2.3 Hydrology

The site has a channel running west/east at its northern boundary, with Knotweed infestation.

3.0 SITE OPERATIONS

3.1 Site Works

The site works comprised 6 Window Sample holes, and 5 Trial Pits which were undertaken up to 14 September 2020. Conditions during the fieldwork were predominantly sunny and dry. The positions are shown on Drawing SGS/2094/02.

The positions of the Ground Investigation holes were limited to those areas, which were not affected by underground utilities.

The work was undertaken in accordance with BS5930.

Samples were recovered of strata encountered, to allow laboratory testing to be undertaken. In-situ Standard Penetration Tests were undertaken within the Window Sample holes. 50mm standpipes were installed at site to facilitate future monitoring if required.

4.0 LABORATORY TESTING

4.1 Introduction

On completion of site operations, selected soil and rock samples were scheduled for laboratory testing. The following laboratory testing was undertaken and is Appended.

- pH,
- Sulphate by aqueous extract
- Metals soil suite
- PAH
- Organic Matter
- Asbestos ID

The results are presented within Appendix D.

5.0 CONTAMINATION TESTING

Contamination testing was undertaken on two samples, as shown in the Appendices.

The results have been compared with current Environment Agency limits for Residential Uses, both with and without plant uptake.

Table 5.1 shows the exceedance, which were arsenic at TP01, 02, 03 and 04 (both with and without plants) and lead at TP01, 03, 04 and 05 (both with and without plants).

Chrysotile asbestos loose fibres were noted at 0.20m in TP04. This appears to be a “hot spot” which should be removed safely prior to development, in accordance with asbestos regulations.

Report 2094/R1 recommended that if soft landscaping be incorporated in the development, then a capping design would be required.

Client Sample ID	Units	TP01	TP02	TP03	TP04	TP05	SGV or other
Depth to Top		0.50	0.50	0.60	0.20	0.30	
Sample Type		Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	
% Stones >10mm	% w/w	12.8	6.6	14.7	<0.1	5.4	
pH	pH	7.57	8.36	8.72	10.32	7.78	
Sulphate (acid soluble)	mg/kg	990	390	1200	1900	960	
Organic matter	% w/w	54.4	11.4	16.3	3.2	2.9	
Arsenic	mg/kg	83	59	185	80	26	35
Copper	mg/kg	169	191	818	302	82	2330
Chromium	mg/kg	19	9	15	19	17	3000
Lead	mg/kg	894	265	1460	1070	585	450
Mercury	mg/kg	<0.17	0.19	0.21	<0.17	<0.17	14
Nickel	mg/kg	58	15	31	26	27	130
Asbestos in Soil (inc. matrix)							
Asbestos in soil		NAD	NAD	NAD	Chrysotile	NAD	
Asbestos ACM - Suitable for Water Absorption Test?		N/A	N/A	-	Loose Fibres	-	

PAH-16MS							SGV
Acenaphthene	mg/kg	0.04	0.02	<0.01	<0.01	<0.01	1000
Acenaphthylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	850
Anthracene	mg/kg	0.07	0.06	<0.02	<0.02	<0.02	9200
Benzo(a)anthracene	mg/kg	0.43	0.37	0.08	<0.04	<0.04	5.9
Benzo(a)pyrene	mg/kg	0.31	0.32	0.08	<0.04	<0.04	1
Benzo(b)fluoranthene	mg/kg	0.89	0.5	0.15	0.05	<0.05	7
Benzo(ghi)perylene	mg/kg	0.25	0.18	0.06	<0.05	<0.05	47
Benzo(k)fluoranthene	mg/kg	0.31	0.17	<0.07	<0.07	<0.07	10
Chrysene	mg/kg	0.73	0.48	0.17	0.07	<0.06	9.3
Dibenzo(ah)anthracene	mg/kg	0.09	0.08	<0.04	<0.04	<0.04	0.9
Fluoranthene	mg/kg	1.11	0.6	0.12	<0.08	<0.08	670
Fluorene	mg/kg	<0.01	0.02	0.01	<0.01	<0.01	780
Indeno(123-cd)pyrene	mg/kg	0.3	0.22	0.06	<0.03	<0.03	4.2
Naphthalene	mg/kg	0.26	0.06	<0.03	<0.03	<0.03	8.7
Phenanthrene	mg/kg	0.67	0.38	0.13	0.04	<0.03	380
Pyrene	mg/kg	0.92	0.49	0.1	<0.07	<0.07	1600
Total PAH-16MS	mg/kg	6.38	3.95	0.96	0.16	<0.08	14574

6% SOM
Residential No Plant
Uptake.

Table 5.1: Contamination Results

6.0 COVER THICKNESS

BRE Cover Thickness assessments have been undertaken for each elevated determinand.

SGS have assessed the area around TP1 and TP2 (Block A) as Residential with plant uptake, as the development is a house with rear garden. The area around TP3 to 5 (Block B) has been assessed as Residential without plant uptake.

Block A

The cover thickness model for Area A shows there to be a requirement to ensure an inert cover thickness to the soft landscaped area of 350mm, due to the elevated Lead at TP1.

Block B

The cover thickness model for Area B shows there to be a requirement to ensure an inert cover thickness to the soft landscaped area of 325mm, due to the elevated Lead at TP4, which is the closest pit to the grassed area.

The inert layers can comprise imported materials and Topsoil.

Imported soils will need to be supplied with Certificates of Conformity, showing they are suitable for purpose. The finished surfaces will require verification testing and a verification report to show compliance.

Contamination testing has shown there to be elevated occurrence of both lead and arsenic. Cover System Assessment has been undertaken. Loose fibres of asbestos were noted at one location at Block B which is considered to be a “hot spot”, which should be removed and replaced prior to development.

APPENDIX A

Drawings

Site Location

Exploratory Hole Locations