

Ref: 3821/20

**Report on Subsoil Investigations
on
Land Adjacent Canon Barn,
Felderland Lane, Worth,
Kent CT14 0BN.**

November 2020

**R. Carr Geotechnical Services, 9 The Mallows, Maidstone, Kent ME14 2PX
Tel: 07974 758617 Email: RONCARR200@aol.com**

Land Adjacent Canon Barn, Felderland Lane, Worth, Kent CT14 0BN.

1. Introduction

- 1.1 This report has been prepared on behalf of Mr D Mills, prospective developer of land located adjacent to Canon Barn, Felderland Lane, Worth.
- 1.2 The proposed development comprises the construction of a detached dwelling and attached garage.
- 1.3 Contained within the report are details of ground conditions that prevail beneath the site in order to provide parameters for the design of appropriate foundations and surface water drainage for the development. This information has been derived from borehole investigations and subsequent laboratory tests undertaken on samples of soil obtained from the site. An analysis of soil contaminants is also provided for the purpose of waste disposal.

2. Topography

- 2.1 The site is located to the south of Felderland Lane at OS Land Ranger map reference TR 327 561. At this point, ground level is trending very gently downhill from south to north.
- 2.2 At the time of the investigation the site comprised an extensive area of mown grass. Deciduous hedgerows enclosed the north, south and west sides of the site, though the area of proposed development was remote from any significant vegetation. A timber fence of recent construction formed the site's east boundary, adjacent to a detached property known as Canon Barn which was undergoing refurbishment.

3. Geology

- 3.1 Reference to the local Geological Survey sheet (no. 290: Dover) has indicated that the site is located upon an area of Head Brickearth, underlain by the White Chalk subgroup (formerly referred to as the Upper Chalk).

3.2 The Head Brickearth typically comprises structureless silty clay, often containing locally derived materials such as sand and gravel.

3.3 The White Chalk consists of soft, white, friable limestone that is 95% calcium carbonate and contains scattered nodular and tabular flint. The upper surface of the Chalk is often deeply convoluted and may contain solution pipes filled with overlying Tertiary or Quaternary deposits.

4. Subsoil Investigations

4.1 Two continuously sampled boreholes were carried out to a depth of 3m with a tracked windowless sampler at the east and west sides of the proposed building footprint as denoted on the accompanying site plan (WS1 & WS2). Owing to a dramatic variation in the depth of the underlying Chalk near the site's north boundary, an additional borehole was undertaken to a depth of 5m at the north end of the proposed garage (WS3). Full details of the encountered soils are provided in strata logs appended with the report, but can be conveniently summarised as follows:

| Depth | Stratum |
|---------------------------|---|
| Ground level – 0.20m/1.0m | FILL – turf/topsoil over silty clay with flint, chalk and brick gravel |
| 0.20m/1.0m – 1.2m/4.8m | HEAD BRICKEARTH – stiff silty CLAY and sandy CLAY with scattered fine chalk and flint gravel |
| 1.2m/4.8m – 5m+ | ?SEAFORD CHALK – medium density white CHALK composed of sandy silt with abundant subangular gravel Grade IV C4 |

4.2 Groundwater was not encountered and the sides of the boreholes remained stable throughout drilling.

4.3 Standard Penetration Tests (SPTs) undertaken in the boreholes as drilling progressed provided the following soil strength results:

| Depth | N value | | |
|-------|---------|-----|-----|
| | WS1 | WS2 | WS3 |
| 1m | 16 | 14 | 14 |
| 2m | 16 | 20 | 16 |
| 3m | 17 | 18 | 18 |

Percolation Test

4.4 A falling head percolation test was undertaken at a depth of 2m in an additional borehole carried out in the area of a proposed attenuation tank (WS4). After one hour's standing time only superficial soakage had occurred within the overlying topsoil. The borehole was therefore re-drilled to the interface of the Chalk and the test repeated at a depth of 5m. The following infiltration rate (f) has been calculated in compliance with BRE365:

$$\text{WS4 (5m)} \quad f = 2.067 \times 10^{-06} \text{ m/sec}$$

5. Laboratory Tests

5.1 Atterberg classification tests carried out on representative samples of the Brickearth recovered from depths of 1m and 1.5m have categorised the subsoil as being clay of low, intermediate and high plasticity (CL, CI & CH). Such soils may exhibit changes in volume following fluctuations in moisture content. Fluctuations in moisture content occur during periods of prolonged summer drought to depths of at least 1m, the depth of soil moisture deficit increasing considerably if large trees are present on the site.

5.2 Soil pH of 7.9 and 8.1 with water soluble sulphate content of 0.02 and 0.01 g/L has been determined from soil samples obtained at a depth of 2m in WS1 and WS3 (Class DS-1).

5.3 A Waste Acceptance Criteria test undertaken on a sample of soil obtained from WS1 at 0.5m has indicated that excavated soil removed from the site is suitable for disposal as inert waste.

6. Discussion

6.1 The investigation has confirmed the existence of the Head Brickearth beneath the site, overlain by a superficial layer of made ground (Fill) varying between 0.2m and 1m in thickness. The underlying Chalk formation was penetrated at a depth of 1.2m in the central area of the site, but dipped considerably to a depth of 4.8m over a short distance towards the site's north end.

6.2 Groundwater was not encountered within 5m of the site surface, though the hydrogeology of the site may vary throughout the year and groundwater levels may rise during winter months.

6.3 It is essential that foundations should extend below the depth of any made ground or compressible soil and penetrate competent, load-bearing material. An acceptable bearing pressure of 120 kN/m² is applicable within both the Head Brickearth and the underlying Chalk at a minimum depth of 1m. NHBC Classification of the Brickearth: Medium Volume Change Potential. The Chalk can be regarded as non-plastic, therefore unlikely to exhibit volumetric changes. No vegetation likely to exert a significant effect on the subsoil was present in the vicinity of the proposed development at the time of the investigation. It is recommended that any foundations spanning strata of differing composition should be provided with mesh reinforcing.


6.4 The sulphate determinations are indicative that special precautions would not be necessary within a subterranean concrete mix placed upon the site (see BRE Special Publication 1 (2005) "Concrete in Aggressive Ground").

6.5 Waste Acceptance Criteria testing has indicated that excavated soil removed from

the site is suitable for disposal as inert waste.

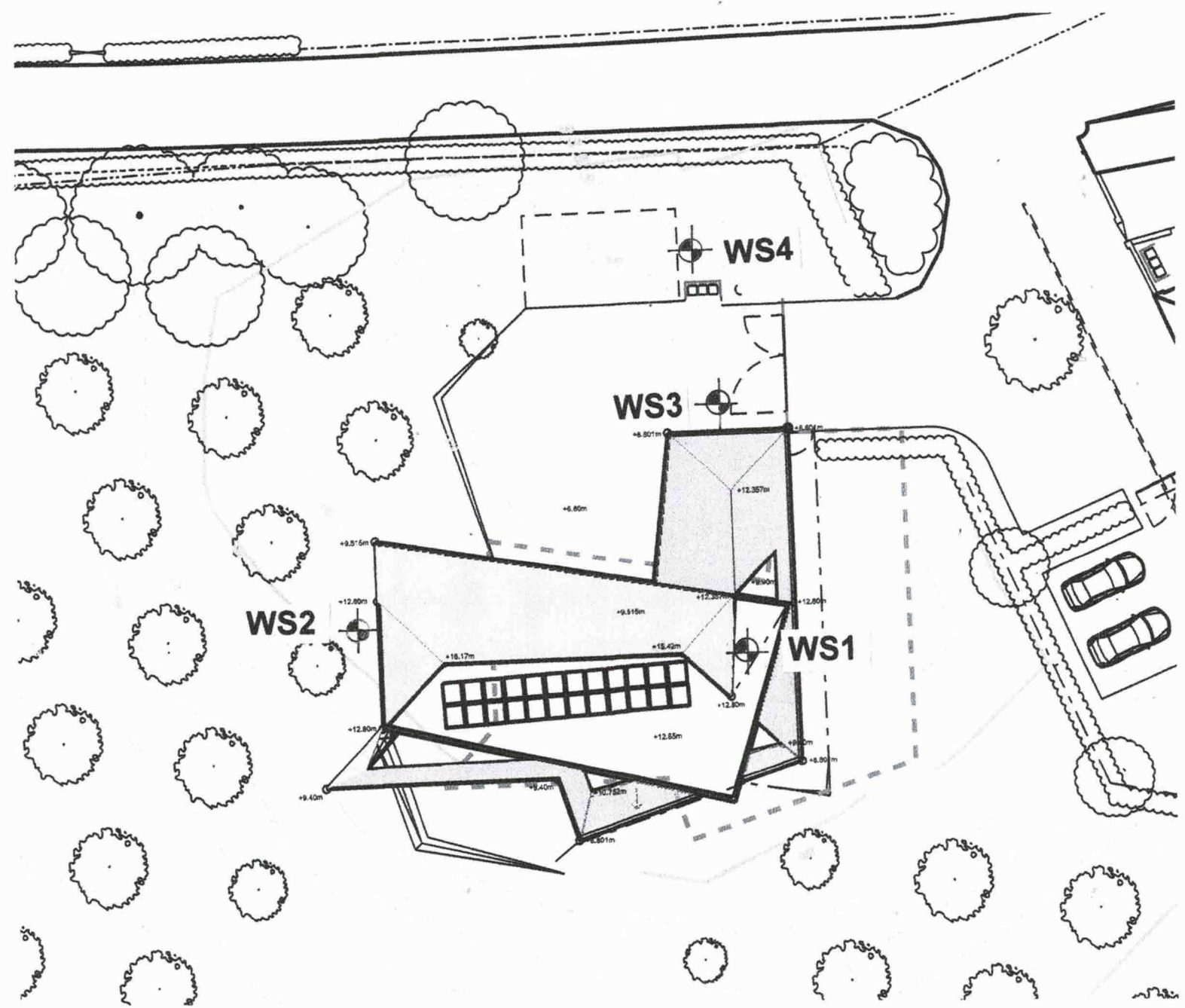
Surface Water Drainage

- 6.6 Soakage potential within the Brickearth is very poor and is only likely to be effective within the underlying Chalk stratum.
- 6.7 This report has been prepared from information obtained at representative locations of the site. Whilst no significant variation in ground conditions is anticipated to occur across the site, no responsibility can be accepted for any such variations that may exist in hitherto uninvestigated areas.



R. Carr BA (Hons) FGS

November 2020



**Land adjacent Canon Barn, Felderland Lane, Worth.
Plan showing locations of boreholes.**

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS1

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | G.L. | DESCRIPTION OF SOIL |
|-------------------|----------|------|---|
| | | 0.25 | Turf over dark brown clayey topsoil |
| ● | 0.50 | 0.50 | Stiff brown silty CLAY with occasional fine chalk gravel and medium to coarse subrounded flint gravel (HEAD BRICKEARTH) |
| SPT ● 'N=16 | 1.00 | 1.00 | |
| | | 1.20 | |
| ● | 1.50 | 1.50 | |
| SPT ● 'N=16 | 2.00 | 2.00 | Medium density white CHALK composed of sandy silt with abundant coarse subangular gravel (?SEAFORD CHALK) Grade IV C4 |
| | | 2.50 | |
| ● | 2.50 | 2.50 | |
| SPT ● 'N=17 | 3.00 | 3.00 | |
| | | End | Borehole dry on completion Sides of borehole stable ● '= Disturbed sample SPT '= Standard Penetration Test |
| | | 3.50 | |
| | | 4.00 | |
| | | 4.50 | |

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS2

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | G.L. | DESCRIPTION OF SOIL |
|-------------------|----------|------|--|
| | | 0.20 | Turf over dark brown sandy topsoil |
| | | 0.50 | Stiff brown silty CLAY with locally abundant fine to coarse subangular and subrounded flint gravel (HEAD BRICKEARTH) Becoming slightly sandy at 0.8m |
| SPT ● 'N=14 | 1.00 | 1.00 | |
| | | 1.20 | |
| | 1.50 | 1.50 | Medium density white CHALK composed of sandy silt with abundant coarse gravel (?SEAFORD CHALK) Grade IV C4 |
| ● | | | |
| SPT ● 'N=20 | 2.00 | 2.00 | |
| | | 2.50 | |
| | 2.50 | 2.50 | Borehole dry on completion Sides of borehole stable ● '= Disturbed sample SPT '= Standard Penetration Test |
| ● | | | |
| SPT ● 'N=18 | 3.00 | 3.00 | |
| | | End | |
| | | 3.50 | |
| | | 4.00 | |
| | | 4.50 | |

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS3

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | G.L. | DESCRIPTION OF SOIL |
|-------------------|----------|------|---|
| | | | |
| | | 0.20 | Turf over brown clayey topsoil with fine brick and chalk gravel |
| | | 0.50 | Brown silty clay with occasional fine white chalk gravel and scarce fine brick gravel (FILL) |
| SPT ● 'N=14 | 1.00 | 1.00 | |
| | | 1.50 | Stiff brown silty CLAY with occasional fine chalk gravel and subrounded flint gravel (HEAD BRICKEARTH) |
| SPT ● 'N=16 | 2.00 | 2.00 | |
| | | 2.50 | Stiff olive-brown silty slightly sandy CLAY with occasional coarse subangular flint gravel (HEAD BRICKEARTH) |
| | | 3.00 | |
| SPT ● 'N=18 | 3.50 | 3.50 | |
| | | 4.00 | |
| | | 4.50 | |
| | | | Cont/... |

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS3 (cont)

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | Cont | DESCRIPTION OF SOIL |
|--------|----------|------|---|
| ● | 5.00 | 4.80 | Soft white CHALK composed of sandy silt with abundant coarse subangular gravel (? SEAFORD CHALK) |
| | | 5.00 | |
| | | End | Borehole dry on completion Sides of borehole stable ● '= Disturbed sample SPT '= Standard Penetration Test |
| | | 5.50 | |
| | | 6.00 | |
| | | 6.50 | |
| | | 7.00 | |
| | | 7.50 | |
| | | 8.00 | |
| | | 8.50 | |
| ● | 9.00 | 9.00 | Cont/... |

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS4

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | G.L. | DESCRIPTION OF SOIL |
|--------|----------|------------------------------|---|
| | 0.30 | | Dark brown topsoil and brown silty clay with occasional fine to coarse chalk, flint and brick gravel (FILL) |
| | 0.50 | — x — o o — — x | Stiff brown silty CLAY with scattered fine chalk gravel and occasional fine to coarse subrounded flint gravel (HEAD BRICKEARTH) |
| | 1.00 | — — x — — o — x — — | |
| | 1.50 | — — — — — x — — — | |
| | 2.00 | — — — — — x — — — | |
| | 2.50 | — — — — — x — — — | |
| | 3.00 | — — — — — x — — — | |
| | 3.50 | — — — x — — — — — — | Stiff olive-brown silty slightly sandy CLAY (HEAD BRICKEARTH) |
| | 4.00 | — — — — — x — — — | |
| | 4.50 | — — — x — — — — — — | Cont/... |

R. CARR GEOTECHNICAL SERVICES

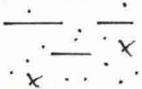
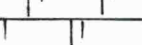
STRATA LOG

Job: FELDERLAND LANE, WORTH

No. WS4 (cont)

Method of excavation: **Tracked Windowless Sampler**

Date: 11.11.20

| SAMPLE | DEPTH m. | Cont | DESCRIPTION OF SOIL |
|--------|----------|---|--|
| | 4.80 |  | Soft white CHALK composed of sandy silt with abundant coarse subangular gravel |
| | 5.00 |  | (? SEAFORD CHALK) |
| | | End | Borehole dry on completion Sides of borehole stable |
| | 5.50 | | |
| | 6.00 | | |
| | 6.50 | | |
| | 7.00 | | |
| | 7.50 | | |
| | 8.00 | | |
| | 8.50 | | |
| ● | 9.00 | 9.00 | Cont/... |



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

DETS Report No: 20-13258

Site Reference: Felderland Lane, Worth

Project / Job Ref: 3821

Order No: 3821/20

Sample Receipt Date: 12/11/2020

Sample Scheduled Date: 12/11/2020

Report Issue Number: 1

Reporting Date: 18/11/2020

Authorised by:



Dave Ashworth
Technical Manager

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

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| Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--------------------------|---------------|------------------------|---|-------|---|--|--|----------------------|---|--------------------------|----|----|----|----|----|-----|---|----|----|---|----|----|-----|----|----|-----|----|----|----|----|----|----|-----------------|-----------------|
| DETS Report No: 20-13258 | | Date Sampled | 11/11/20 | | <table border="1"> <thead> <tr> <th colspan="3">Landfill Waste Acceptance Criteria Limits</th> </tr> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table> | | Landfill Waste Acceptance Criteria Limits | | | Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill | 3% | 5% | 6% | -- | -- | 10% | 6 | -- | -- | 1 | -- | -- | 500 | -- | -- | 100 | -- | -- | -- | >6 | -- | -- | To be evaluated | To be evaluated |
| Landfill Waste Acceptance Criteria Limits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inert Waste Landfill | Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill | Hazardous Waste Landfill | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3% | 5% | 6% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -- | -- | 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 500 | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | -- | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -- | >6 | -- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -- | To be evaluated | To be evaluated | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R Carr Geotechnical Services | | Time Sampled | None Supplied | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Site Reference: Felderland Lane, Worth | | TP / BH No | WS1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project / Job Ref: 3821 | | Additional Refs | None Supplied | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Order No: 3821/20 | | Depth (m) | 0.50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reporting Date: 18/11/2020 | | DETS Sample No | 510083 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Determinand | Unit | MDL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOC ^{MU} | % | < 0.1 | 0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Loss on Ignition | % | < 0.01 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BTEX ^{MU} | mg/kg | < 0.05 | < 0.05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sum of PCBs | mg/kg | < 0.1 | < 0.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mineral Oil ^{MU} | mg/kg | < 10 | < 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total PAH ^{MU} | mg/kg | < 1.7 | < 1.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH ^{MU} | pH Units | N/a | 8.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acid Neutralisation Capacity | mol/kg (+/-) | < 1 | < 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eluate Analysis | | 2:1 | 8:1 | Cumulative 10:1 | Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | mg/l | mg/l | mg/kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic ^U | | < 0.01 | < 0.01 | < 0.2 | 0.5 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Barium ^U | | < 0.02 | < 0.02 | < 0.1 | 20 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cadmium ^U | | < 0.0005 | < 0.0005 | < 0.02 | 0.04 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chromium ^U | | < 0.005 | < 0.005 | < 0.20 | 0.5 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Copper ^U | | < 0.01 | 0.01 | < 0.5 | 2 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mercury ^U | | < 0.0005 | < 0.0005 | < 0.005 | 0.01 | 0.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Molybdenum ^U | | 0.006 | 0.001 | < 0.1 | 0.5 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nickel ^U | | < 0.007 | < 0.007 | < 0.2 | 0.4 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lead ^U | | < 0.005 | < 0.005 | < 0.2 | 0.5 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Antimony ^U | | < 0.005 | < 0.005 | < 0.05 | 0.06 | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Selenium ^U | | < 0.005 | < 0.005 | < 0.05 | 0.1 | 0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Zinc ^U | | < 0.005 | < 0.005 | < 0.2 | 4 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chloride ^U | | 6 | 9 | 87 | 800 | 15000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fluoride ^U | | < 0.5 | < 0.5 | < 1 | 10 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulphate ^U | | 3 | 7 | 61 | 1000 | 20000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TDS | | 98 | 71 | 743 | 4000 | 60000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phenol Index | | < 0.01 | < 0.01 | < 0.5 | 1 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DOC | | 5.7 | 11.5 | 108 | 500 | 800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leach Test Information | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sample Mass (kg) | | 0.21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dry Matter (%) | | 84.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture (%) | | 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stage 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Volume Eluate L2 (litres) | | 0.32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filtered Eluate VE1 (litres) | | 0.21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M Denotes MCERTS accredited test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U Denotes ISO17025 accredited test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



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



| Soil Analysis Certificate - Sample Descriptions | |
|---|--|
| DETS Report No: 20-13258 | |
| R Carr Geotechnical Services | |
| Site Reference: Felderland Lane, Worth | |
| Project / Job Ref: 3821 | |
| Order No: 3821/20 | |
| Reporting Date: 18/11/2020 | |

| DETS Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|----------------|------------|-----------------|-----------|----------------------|------------------------------|
| 510083 | WS1 | None Supplied | 0.50 | 15.2 | Brown sandy clay with stones |

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

Insufficient Sample ^{US}

Unsuitable Sample ^{US}

| Parameter | Matrix Type | Suite Reference | Expanded Uncertainty Measurement | Unit |
|------------------------------|-------------|-----------------|----------------------------------|-------|
| TOC | Soil | BS EN 12457 | 13.49 | % |
| Loss on Ignition | Soil | BS EN 12457 | 17 | % |
| BTEX | Soil | BS EN 12457 | 14 | % |
| Sum of PCBs | Soil | BS EN 12457 | 23 | % |
| Mineral Oil | Soil | BS EN 12457 | 9 | % |
| Total PAH | Soil | BS EN 12457 | 20 | % |
| pH | Soil | BS EN 12457 | 0.399 | Units |
| Acid Neutralisation Capacity | Soil | BS EN 12457 | 18 | % |
| Arsenic | Leachate | BS EN 12457 | 16.63 | % |
| Barium | Leachate | BS EN 12457 | 14.29 | % |
| Cadmium | Leachate | BS EN 12457 | 14.44 | % |
| Chromium | Leachate | BS EN 12457 | 18.06 | % |
| Copper | Leachate | BS EN 12457 | 21.27 | % |
| Mercury | Leachate | BS EN 12457 | 24.13 | % |
| Molybdenum | Leachate | BS EN 12457 | 12.55 | % |
| Nickel | Leachate | BS EN 12457 | 20.08 | % |
| Lead | Leachate | BS EN 12457 | 13.43 | % |
| Antimony | Leachate | BS EN 12457 | 18.85 | % |
| Selenium | Leachate | BS EN 12457 | 18.91 | % |
| Zinc | Leachate | BS EN 12457 | 13.71 | % |
| Chloride | Leachate | BS EN 12457 | 16 | % |
| Fluoride | Leachate | BS EN 12457 | 19.4 | % |
| Sulphate | Leachate | BS EN 12457 | 19.63 | % |
| TDS | Leachate | BS EN 12457 | 12 | % |
| Phenol Index | Leachate | BS EN 12457 | 14 | % |
| DOC | Leachate | BS EN 12457 | 10 | % |
| Clay Content | Soil | BS 3882: 2015 | 15 | % |
| Silt Content | Soil | BS 3882: 2015 | 14 | % |
| Sand Content | Soil | BS 3882: 2015 | 13 | % |
| Loss on Ignition | Soil | BS 3882: 2015 | 17 | % |
| pH | Soil | BS 3882: 2015 | 0.399 | Units |
| Carbonate | Soil | BS 3882: 2015 | 16 | % |
| Total Nitrogen | Soil | BS 3882: 2015 | 12 | % |
| Phosphorus (Extractable) | Soil | BS 3882: 2015 | 24 | % |
| Potassium (Extractable) | Soil | BS 3882: 2015 | 20 | % |
| Magnesium (Extractable) | Soil | BS 3882: 2015 | 26 | % |
| Zinc | Soil | BS 3882: 2015 | 14.9 | % |
| Copper | Soil | BS 3882: 2015 | 16 | % |
| Nickel | Soil | BS 3882: 2015 | 17.7 | % |
| Available Sodium | Soil | BS 3882: 2015 | 23 | % |
| Available Calcium | Soil | BS 3882: 2015 | 23 | % |
| Electrical Conductivity | Soil | BS 3882: 2015 | 10 | % |



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



| Soil Analysis Certificate - Methodology & Miscellaneous Information | |
|---|--|
| DETS Report No: 20-13258 | |
| R Carr Geotechnical Services | |
| Site Reference: Felderland Lane, Worth | |
| Project / Job Ref: 3821 | |
| Order No: 3821/20 | |
| Reporting Date: 18/11/2020 | |

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

D Dried
AR As Received