



Reeve-Tec Membranes Ltd • Unit 5, Gransden Park  
Potton Road • Abbotsley • Cambridgeshire PE19 6TY  
T 01767 677405 E [info@reevetecmembranes.co.uk](mailto:info@reevetecmembranes.co.uk)  
[www.reevetecmembranes.co.uk](http://www.reevetecmembranes.co.uk)  
Registered in England No: 07798604



# *Certificate of Conformity*

**CUSTOMER:** O'Halloran & O'Brien Ltd  
O'Brien House  
197-199 Garth Road  
Morden  
Surrey  
SM4 4NE

**APPLICATION:** Plot 44, Portman Road, Reading

**MATERIALS:** 'RTEC' VOC BBA APPROVED Gas & Hydrocarbon Resistant Membrane.

**REEVETEC MEMBRANES LTD** certifies the following:

That the above products conform to the specification and details on the purchase order and dispatch documents.

ReeveTec Membranes Ltd also confirms that our NVQ Level 2 supervised Installation Technicians have carried out the method of installation of the above materials in accordance with BRE 212 & 414, BS 8485 and CIRIA reports 635 & 735 guidelines.



\_\_\_\_\_  
**Project Manager**



\_\_\_\_\_  
**Director**

**31/10/2022**

\_\_\_\_\_  
**Date**

### **Guarantee of Installation by ReeveTec Membranes Ltd**

All materials supplied and fitted by ReeveTec Membranes Ltd employees are installed in accordance with our standard working procedures, construction drawings and all written instructions from the original purchaser. When installed and subject to normal conditions of use, the membranes will provide an effective barrier which will be substantially impervious to the transmission of gas and water vapour for the life of the building. A Certificate of Conformity is issued for each unit upon completion of installation.

The foregoing representations are subject to the following conditions:

- i. The gas membrane is required to have been supplied and installed by ReeveTec Membranes Ltd (RTML).
- ii. The site preparation in all aspects must have been carried out in accordance with the standard contract terms and conditions of RTML and site preparation must be accepted by RTML prior to installation.
- iii. The membrane must not have been damaged in anyway including but not limited to physical or chemical impact.
- iv. RTML must be given full access to the installation about which a claim has been made, with a view to identifying the matter complained of. Exposure of the membrane and covering it up will not be at RTML expense.

**If the membrane is altered in anyway after installation, this must be reported to RTML, so that works can be carried out to maintain the integrity of the gas membrane – costs to be confirmed. Failure to do so could nullify this guarantee.**



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\_\_\_\_\_  
**Project Manager**



\_\_\_\_\_  
**Director**

**31/10/2022**

\_\_\_\_\_  
**Date**

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\_\_\_\_\_  
**Project Manager**



\_\_\_\_\_  
**Director**

**31/10/2022**

\_\_\_\_\_  
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## Appendix E - Cover Soils Validation

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Jack Johnson  
Bellway Homes Limited (Thames Valley)  
Pacific House  
Imperial Way  
Reading  
Berkshire  
RG2 0TD

Our Ref: CRM.1265.007.L.001.A

28 June 2020

Sent via email ([jack.johnson@bellway.co.uk](mailto:jack.johnson@bellway.co.uk))

Dear Jack

**Battle Hospital, Portman Way, Reading, RG30 1AH**

### **Introduction**

A Phase I Desk Study and Subsequent Phase II Intrusive Ground Investigation were undertaken at the above-named site by RSK Environmental Limited in March 2017. Visual and olfactory evidence of contamination by hydrocarbons, solvents and a sulphurous odour were noted during the site investigation. Chemical analysis showed exceedance of the reference values for Lead, Polycyclic Aromatic Hydrocarbons (PAH) Hydrocarbons within Made Ground. Asbestos fibres were also detected.

As the site is being re-developed for residential apartments with communal garden areas and private housing, remediation to areas of soft landscaping was proposed. This would comprise 300mm clean materials over a Geotextile no-dig barrier within communal garden areas, and 600mm clean materials over a Geotextile no-dig barrier within private gardens. This was submitted to Reading Borough Council in Remedial Methodology Strategy – CRM.1265.007.GE.R.002.A. and was approved. During the works, no subsequent site observations indicated any change was required.

### **Site Inspection**

On the 17<sup>th</sup> February 2020 Enzygo Geo Environmental Limited undertook a site visit to obtain samples of subsoil. One sample was taken between the locations of HPK and HPL as there was no property divide in place. This was done to ensure the subsoil was suitable before placing topsoil.

On the 22<sup>nd</sup> June 2020 Enzygo Geo Environmental Limited undertook a site inspection to excavate and confirm the presence of a Geotextile no-dig barrier beneath 600mm clean materials. During this inspection, the property divide had been erected. Therefore, as per the Remedial Methodology Statement, samples were obtained from HPK and HPL.

Photos of Hand Pits are shown in Appendix A. The locations of the hand pits are shown on Drawing CRM.1265.007.GE.D.001, which is included in Appendix B.

No further areas of contamination were identified during the construction phase or during the validation inspection, therefore no additional remedial measures were required or undertaken.

### **Cover Soils**

Hand Pits confirmed the presence of 600mm of cover soils over a geotextile no dig barrier, meeting the required depth for residential use with plant uptake. Photographs of the hand pits are included in Appendix A. Samples were recovered from the Hand Pits and submitted to the laboratories of I2 who are UKAS and MCERTS accredited for testing.

### **Chemical Analysis**

Chemical analysis reports have been supplied by the client prior to the materials being imported to site. These certificates meet the GAC values for residential use with plant uptake. No asbestos was detected. These are included in Appendix C.

Soil samples from the validation pits were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that is cleaned at each sampling location.

Soil samples we sent to the laboratories of I2 who are UKAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH CWG) and asbestos screen.

Results show the materials used meet the GAC values for residential use with plant uptake. These are shown in Appendix D.

### **Conclusion**

Based on the site inspection undertaken, information provided and results it is considered that the cover soils placed within plots 41 – 47 are in accordance with the approved Remedial Methodology.

We hope that we have correctly interpreted your requirements.

Yours sincerely,  
For and on behalf of Enzygo

A handwritten signature in black ink, appearing to read 'R Reece'.

Richard Reece  
Environmental Consultant

## APPENDICES

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## APPENDIX A – PHOTOGRAPHS

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## HPK



## HPL



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## APPENDIX B – LOCATION PLAN

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| Key |                                                         |
|-----|---------------------------------------------------------|
|     | Site Boundary                                           |
|     | Verification Pits in Communal Areas (HP)<br>(HP1 - HP8) |
|     | Verification Pits in Gardens (HP)<br>(HPA - HPL)        |



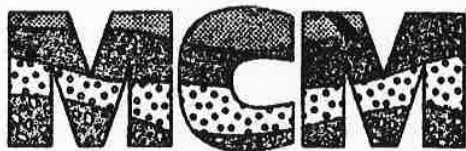
Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

|                                          |              |
|------------------------------------------|--------------|
| CLIENT:                                  |              |
| Bellway Homes Limited<br>(Thames Valley) |              |
| SCALE:                                   | PROJECT REF: |
| 1:1,000@A3                               | CRM.1265.007 |
| DRAWN:                                   | CHECKED:     |
| NP                                       | SR           |
| DATE:                                    |              |
| July 2018                                |              |
| PROJECT:                                 |              |
| Portman Way, Reading                     |              |
| TITLE:                                   |              |
| Site Location Plan                       |              |
| FIGURE NO:                               |              |
| CRM.1265.007.GE.D.001                    |              |

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## APPENDIX C – IMPORTED SOILS CHEMICAL ANALYSIS

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020 8339 9909

Freeland Horticulture Ltd

Rosedale Nursery  
College Road  
Hextable  
Kent  
BR8 7LT

**Freeland**  
HORTICULTURE LIMITED

Attention: Philippa Lambourne

Our Ref: 816-SA

16 January 2020

Dear Philippa

**Topsoil Analysis Report : Beenham Topsoil –January 2020**

We have completed the analysis of the topsoil sample recently taken from the above site and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes.

**SOIL SAMPLING & EXAMINATION**

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as a dark brown, slightly moist, friable *loamy sand* with a well developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

**LABORATORY ANALYSIS**

The topsoil sample was submitted to a UKAS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- ✦ pH & electrical conductivity values;
- ✦ major plant nutrients (N, P, K, Mg) & organic matter content;
- ✦ particle size distribution and stone content;
- ✦ heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- ✦ sulphate, sulphur, sulphide;
- ✦ total cyanide and total (mono) phenols;
- ✦ speciated PAHs (US EPA16);
- ✦ banded aromatic and aliphatic petroleum hydrocarbons (C<sub>6</sub>-C<sub>35</sub>).
- ✦ Asbestos

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Phone: 01322 619161

## COMMENTS

### **pH & Electrical Conductivity (salinity) Values**

The sample was alkaline in reaction (pH 8.5) with a pH value that would be suitable for general landscaping purposes.

The electrical conductivity value using the soil:water extract was moderate (1395/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

### **Organic Matter & Nutrient Status**

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

### **Particle Size Distribution & Stone Content**

The sample contained 85% sand and fell into the *loamy sand* texture class. Suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding. As such, we would not consider this sand level to be problematic.

The sample was free from stones of 20 mm and upwards in diameter and only contained a slight fraction of smaller stones (4.4%). As such, stones will not restrict the use of the soil for landscaping purposes.

### **Potential Contaminants**

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil so the following comments are based on the Soil Guideline Values (SGVs) for residential end-use presented in the Contaminated Land Exposure Assessment (CLEA) Model (EA/DEFRA:2002). The SGVs currently only consider a limited range of parameters so where a potential contaminant is not covered by the CLEA Model other relevant schedules for contamination assessment, such as the Dutch Guidelines, and professional judgement have been used.

Of the potential contaminants determined, none was found at levels that would indicate significant contamination.

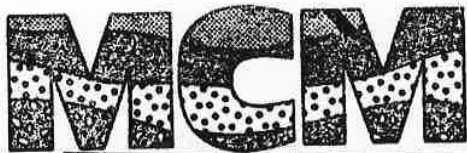
## CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, sandy sand. The organic matter and nutrient levels are acceptable, and no significant contamination was found with respect to the parameters determined and the sand content would not be considered problematic. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.



**Freeland**  
HORTICULTURE LIMITED

|            |                           |
|------------|---------------------------|
| Client     | Freeland Horticulture Ltd |
| Job Name   | Topsoil Analysis          |
| Site       | Beenham, Berkshire        |
| Month/Year | January 20                |
| Our Ref    | 0816-SA                   |
| Date       | 16 January 2020           |

#### pH Value & Salinity

|                                                  |                  |      |
|--------------------------------------------------|------------------|------|
| pH value (1:2.5 soil/water ext)                  | units            | 8.5  |
| Electrical Conductivity (1:2.5 soil/water ext)   | $\mu\text{S/cm}$ | 1395 |
| Neutralising Value ( $\text{CaCO}_3$ equivalent) | %                | 2.9  |
| Neutralising Value ( $\text{CaO}$ equivalent)    | %                | 1.6  |

#### Composite sample

#### Organic Matter & Nutrient Status

|                          |      |       |
|--------------------------|------|-------|
| Organic Matter (LOI)     | %    | 5.2   |
| Organic Carbon (Derived) | %    | 3.0   |
| Total Nitrogen           | %    | 0.312 |
| Carbon:Nitrogen Ratio    | :1   | 10    |
| Available Phosphorus     | mg/l | 76.0  |
| Available Potassium      | mg/l | 1162  |
| Available Magnesium      | mg/l | 140   |

#### Particle Size Analysis & Stones

|                      |          |      |
|----------------------|----------|------|
| Clay (<0.002mm)      | %        |      |
| Silt (0.063-0.002mm) | %        | 8    |
| Sand (2.0-0.063mm)   | %        | 95   |
| Texture Class        | UK Class | Sand |

|                |         |     |
|----------------|---------|-----|
| Stones 2-20mm  | % by DW | 1.3 |
| Stones 20-50mm | % by DW | 1.1 |
| Stones >50mm   | % by DW | 0.0 |

#### Potential Contaminants

|                                                 |       |       |
|-------------------------------------------------|-------|-------|
| Total Arsenic (As)                              | mg/kg | 3.7   |
| Total Cadmium (Cd)                              | mg/kg | 0.23  |
| Total Chromium (Cr)                             | mg/kg | <10   |
| Hexavalent Chromium ( $\text{Cr}^{\text{VI}}$ ) | mg/kg | <0.1  |
| Total Copper (Cu)                               | mg/kg | 11.9  |
| Total Lead (Pb)                                 | mg/kg | 20.1  |
| Total Mercury (Hg)                              | mg/kg | <0.2  |
| Total Nickel (Ni)                               | mg/kg | <10   |
| Total Selenium (Se)                             | mg/kg | <0.09 |
| Total Zinc (Zn)                                 | mg/kg | 51.4  |
| Total Beryllium (Be)                            | mg/kg | <1    |
| Total Barium (Ba)                               | mg/kg | 29.6  |
| Total Vanadium (V)                              | mg/kg | <10   |
| Hot Water Soluble Boron (B)                     | mg/kg | 2.0   |
| Total Cyanide (CN)                              | mg/kg | <1    |
| Elemental Sulphur (S)                           | mg/kg | 6.8   |
| Easily Liberated Sulphide ( $\text{S}^{2-}$ )   | mg/kg | <1    |
| Water Soluble Sulphate ( $\text{SO}_4^{2-}$ )   | mg/l  | 70.2  |
| Total Phenols Index                             | mg/kg | <1    |
| Asbestos Screen                                 | -     | N.D.  |



**Freeland**  
HORTICULTURE LIMITED

Client  
Job Name  
Site  
**020 8339 9909**

|            |                           |
|------------|---------------------------|
| Client     | Freeland Horticulture Ltd |
| Job Name   | Topsoil Analysis          |
| Site       | Beenham, Berkshire        |
| Month/Year | January 20                |
| Our Ref    | 0816-SA                   |
| Date       | 18 January 2020           |

#### Polyaromatic Hydrocarbons

|                          |       |       |
|--------------------------|-------|-------|
| Naphthalene              | mg/kg | <0.05 |
| Acenaphthylene           | mg/kg | <0.05 |
| Acenaphthene             | mg/kg | <0.05 |
| Fluorene                 | mg/kg | <0.05 |
| Phenanthrene             | mg/kg | <0.1  |
| Anthracene               | mg/kg | <0.05 |
| Fluoranthene             | mg/kg | 0.2   |
| Pyrene                   | mg/kg | 0.1   |
| Benzo[a]anthracene       | mg/kg | <0.1  |
| Chrysene                 | mg/kg | <0.1  |
| Benzo[b]fluoranthene     | mg/kg | <0.1  |
| Benzo[k]fluoranthene     | mg/kg | <0.1  |
| Benzo[a]pyrene           | mg/kg | <0.1  |
| Indeno[1,2,3-cd]pyrene   | mg/kg | <0.1  |
| Dibenzo[a,h]anthracene   | mg/kg | <0.1  |
| Benzo[g,h,i]perylene     | mg/kg | <0.1  |
| Total PAHs sum US EPA 16 | mg/kg | <1    |

#### Banded Petroleum Hydrocarbons

|                                                 |       |      |
|-------------------------------------------------|-------|------|
| Aliphatic TPH >C <sub>5</sub> -C <sub>6</sub>   | mg/kg | <0.2 |
| Aliphatic TPH >C <sub>6</sub> -C <sub>8</sub>   | mg/kg | 0.4  |
| Aliphatic TPH >C <sub>8</sub> -C <sub>10</sub>  | mg/kg | <4   |
| Aliphatic TPH >C <sub>10</sub> -C <sub>12</sub> | mg/kg | <4   |
| Aliphatic TPH >C <sub>12</sub> -C <sub>16</sub> | mg/kg | <4   |
| Aliphatic TPH >C <sub>16</sub> -C <sub>21</sub> | mg/kg | <4   |
| Aliphatic TPH >C <sub>21</sub> -C <sub>35</sub> | mg/kg | 9.1  |
| Aliphatic TPH >C <sub>35</sub> -C <sub>44</sub> | mg/kg | <12  |

|                                                |       |       |
|------------------------------------------------|-------|-------|
| Aromatic TPH >C <sub>5</sub> -C <sub>7</sub>   | mg/kg | <0.02 |
| Aromatic TPH >C <sub>7</sub> -C <sub>8</sub>   | mg/kg | <0.02 |
| Aromatic TPH >C <sub>8</sub> -C <sub>10</sub>  | mg/kg | <0.02 |
| Aromatic TPH >C <sub>10</sub> -C <sub>12</sub> | mg/kg | <4    |
| Aromatic TPH >C <sub>12</sub> -C <sub>16</sub> | mg/kg | <4    |
| Aromatic TPH >C <sub>16</sub> -C <sub>21</sub> | mg/kg | <4    |
| Aromatic TPH >C <sub>21</sub> -C <sub>35</sub> | mg/kg | 12.0  |
| Aromatic TPH >C <sub>35</sub> -C <sub>44</sub> | mg/kg | <0.2  |

|                                                                 |       |      |
|-----------------------------------------------------------------|-------|------|
| Total Petroleum Hydrocarbons (C <sub>6</sub> -C <sub>44</sub> ) | mg/kg | 21.1 |
|-----------------------------------------------------------------|-------|------|

#### BTEX

|                |       |       |
|----------------|-------|-------|
| Benzene        | mg/kg | <0.02 |
| Toluene        | mg/kg | <0.2  |
| Ethyl Benzene  | mg/kg | <0.04 |
| m- & p- Xylene | mg/kg | <0.2  |
| o- Xylene      | mg/kg | <0.1  |

## APPENDIX D – LABORATORY RESULTS

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**Steve Rhodes**

Enzygo Geoenvironmental Ltd  
The Byre  
Woodend Lane  
Cromhall  
Gloucestershire  
GL12 8AA

i2 Analytical Ltd.  
7 Woodshots Meadow,  
Croxley Green  
Business Park,  
Watford,  
Herts,  
WD18 8YS

**t:** 01923 225404  
**f:** 01923 237404  
**e:** reception@i2analytical.com

**e:** steve.rhodes@enzygo.com

## **Analytical Report Number : 20-87416**

Replaces Analytical Report Number : 20-87416, issue no. 1

Client references/information amended.

|                             |                 |                               |            |
|-----------------------------|-----------------|-------------------------------|------------|
| <b>Project / Site name:</b> | Battle Hospital | <b>Samples received on:</b>   | 18/02/2020 |
| <b>Your job number:</b>     | CRM.1265.007    | <b>Samples instructed on:</b> | 18/02/2020 |
| <b>Your order number:</b>   | CRM.1265.007    | <b>Analysis completed by:</b> | 24/02/2020 |
| <b>Report Issue Number:</b> | 2               | <b>Report issued on:</b>      | 24/02/2020 |
| <b>Samples Analysed:</b>    | 1 soil sample   |                               |            |

**Signed:**

Zina Abdul Razzak  
Senior Quality Specialist

**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

|                                                                                    |           |                           |
|------------------------------------------------------------------------------------|-----------|---------------------------|
| Standard sample disposal times, unless otherwise agreed with the laboratory, are : | soils     | - 4 weeks from reporting  |
|                                                                                    | leachates | - 2 weeks from reporting  |
|                                                                                    | waters    | - 2 weeks from reporting  |
|                                                                                    | asbestos  | - 6 months from reporting |

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Iss No 20-87416-2 Battle Hospital CRM.1265.007

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number: 20-87416

Project / Site name: Battle Hospital

Your Order No: CRM.1265.007

| Lab Sample Number                       |          |                       |                         | 1444879       |     |           |              |  |
|-----------------------------------------|----------|-----------------------|-------------------------|---------------|-----|-----------|--------------|--|
| Sample Reference                        |          |                       |                         | Plot 45       |     |           |              |  |
| Sample Number                           |          |                       |                         | None Supplied |     |           |              |  |
| Depth (m)                               |          |                       |                         | None Supplied |     |           |              |  |
| Date Sampled                            |          |                       |                         | 17/02/2020    |     |           |              |  |
| Time Taken                              |          |                       |                         | None Supplied |     |           |              |  |
| Analytical Parameter<br>(Soil Analysis) | Units    | Limit of<br>detection | Accreditation<br>Status |               |     |           |              |  |
| Stone Content                           | %        | 0.1                   | NONE                    | < 0.1         |     |           |              |  |
| Moisture Content                        | %        | N/A                   | NONE                    | 15            |     |           |              |  |
| Total mass of sample received           | kg       | 0.001                 | NONE                    | 2.0           |     |           |              |  |
| Asbestos in Soil                        |          |                       |                         | Type          | N/A | ISO 17025 | Not-detected |  |
| <b>General Inorganics</b>               |          |                       |                         |               |     |           |              |  |
| pH - Automated                          | pH Units | N/A                   | MCERTS                  | 9.6           |     |           |              |  |
| Total Organic Carbon (TOC)              | %        | 0.1                   | MCERTS                  | 0.8           |     |           |              |  |



Analytical Report Number: 20-87416  
 Project / Site name: Battle Hospital  
 Your Order No: CRM.1265.007

|                                         |       |                       |                         |               |  |  |  |  |
|-----------------------------------------|-------|-----------------------|-------------------------|---------------|--|--|--|--|
| Lab Sample Number                       |       |                       |                         | 1444879       |  |  |  |  |
| Sample Reference                        |       |                       |                         | Plot 45       |  |  |  |  |
| Sample Number                           |       |                       |                         | None Supplied |  |  |  |  |
| Depth (m)                               |       |                       |                         | None Supplied |  |  |  |  |
| Date Sampled                            |       |                       |                         | 17/02/2020    |  |  |  |  |
| Time Taken                              |       |                       |                         | None Supplied |  |  |  |  |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of<br>detection | Accreditation<br>Status |               |  |  |  |  |
| <b>Speciated PAHs</b>                   |       |                       |                         |               |  |  |  |  |
| Naphthalene                             | mg/kg | 0.05                  | MCERTS                  | 0.11          |  |  |  |  |
| Acenaphthylene                          | mg/kg | 0.05                  | MCERTS                  | 0.05          |  |  |  |  |
| Acenaphthene                            | mg/kg | 0.05                  | MCERTS                  | 0.12          |  |  |  |  |
| Fluorene                                | mg/kg | 0.05                  | MCERTS                  | 0.12          |  |  |  |  |
| Phenanthrene                            | mg/kg | 0.05                  | MCERTS                  | 0.71          |  |  |  |  |
| Anthracene                              | mg/kg | 0.05                  | MCERTS                  | 0.17          |  |  |  |  |
| Fluoranthene                            | mg/kg | 0.05                  | MCERTS                  | 0.81          |  |  |  |  |
| Pyrene                                  | mg/kg | 0.05                  | MCERTS                  | 0.73          |  |  |  |  |
| Benzo(a)anthracene                      | mg/kg | 0.05                  | MCERTS                  | 0.48          |  |  |  |  |
| Chrysene                                | mg/kg | 0.05                  | MCERTS                  | 0.36          |  |  |  |  |
| Benzo(b)fluoranthene                    | mg/kg | 0.05                  | MCERTS                  | 0.38          |  |  |  |  |
| Benzo(k)fluoranthene                    | mg/kg | 0.05                  | MCERTS                  | 0.36          |  |  |  |  |
| Benzo(a)pyrene                          | mg/kg | 0.05                  | MCERTS                  | 0.42          |  |  |  |  |
| Indeno(1,2,3-cd)pyrene                  | mg/kg | 0.05                  | MCERTS                  | 0.26          |  |  |  |  |
| Dibenz(a,h)anthracene                   | mg/kg | 0.05                  | MCERTS                  | 0.07          |  |  |  |  |
| Benzo(ghi)perylene                      | mg/kg | 0.05                  | MCERTS                  | 0.30          |  |  |  |  |
| <b>Total PAH</b>                        |       |                       |                         |               |  |  |  |  |
| Speciated Total EPA-16 PAHs             | mg/kg | 0.8                   | MCERTS                  | 5.45          |  |  |  |  |



Analytical Report Number: 20-87416  
 Project / Site name: Battle Hospital  
 Your Order No: CRM.1265.007

| Lab Sample Number                       |       |                       |                         | 1444879       |  |  |  |  |
|-----------------------------------------|-------|-----------------------|-------------------------|---------------|--|--|--|--|
| Sample Reference                        |       |                       |                         | Plot 45       |  |  |  |  |
| Sample Number                           |       |                       |                         | None Supplied |  |  |  |  |
| Depth (m)                               |       |                       |                         | None Supplied |  |  |  |  |
| Date Sampled                            |       |                       |                         | 17/02/2020    |  |  |  |  |
| Time Taken                              |       |                       |                         | None Supplied |  |  |  |  |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of<br>detection | Accreditation<br>Status |               |  |  |  |  |
| <b>Heavy Metals / Metalloids</b>        |       |                       |                         |               |  |  |  |  |
| Arsenic (aqua regia extractable)        | mg/kg | 1                     | MCERTS                  | 8.8           |  |  |  |  |
| Boron (water soluble)                   | mg/kg | 0.2                   | MCERTS                  | 1.3           |  |  |  |  |
| Cadmium (aqua regia extractable)        | mg/kg | 0.2                   | MCERTS                  | < 0.2         |  |  |  |  |
| Chromium (hexavalent)                   | mg/kg | 4                     | MCERTS                  | < 4.0         |  |  |  |  |
| Chromium (aqua regia extractable)       | mg/kg | 1                     | MCERTS                  | 25            |  |  |  |  |
| Copper (aqua regia extractable)         | mg/kg | 1                     | MCERTS                  | 39            |  |  |  |  |
| Lead (aqua regia extractable)           | mg/kg | 1                     | MCERTS                  | 35            |  |  |  |  |
| Mercury (aqua regia extractable)        | mg/kg | 0.3                   | MCERTS                  | < 0.3         |  |  |  |  |
| Nickel (aqua regia extractable)         | mg/kg | 1                     | MCERTS                  | 16            |  |  |  |  |
| Selenium (aqua regia extractable)       | mg/kg | 1                     | MCERTS                  | < 1.0         |  |  |  |  |
| Zinc (aqua regia extractable)           | mg/kg | 1                     | MCERTS                  | 92            |  |  |  |  |

#### Petroleum Hydrocarbons

Analytical Report Number: 20-87416

Project / Site name: Battle Hospital

Your Order No: CRM.1265.007

| Lab Sample Number                       |       |                       |                         | 1444879       |  |  |  |  |
|-----------------------------------------|-------|-----------------------|-------------------------|---------------|--|--|--|--|
| Sample Reference                        |       |                       |                         | Plot 45       |  |  |  |  |
| Sample Number                           |       |                       |                         | None Supplied |  |  |  |  |
| Depth (m)                               |       |                       |                         | None Supplied |  |  |  |  |
| Date Sampled                            |       |                       |                         | 17/02/2020    |  |  |  |  |
| Time Taken                              |       |                       |                         | None Supplied |  |  |  |  |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of<br>detection | Accreditation<br>Status |               |  |  |  |  |
| TPH-CWG - Aliphatic >EC5 - EC6          | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aliphatic >EC6 - EC8          | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aliphatic >EC8 - EC10         | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aliphatic >EC10 - EC12        | mg/kg | 1                     | MCERTS                  | < 1.0         |  |  |  |  |
| TPH-CWG - Aliphatic >EC12 - EC16        | mg/kg | 2                     | MCERTS                  | < 2.0         |  |  |  |  |
| TPH-CWG - Aliphatic >EC16 - EC21        | mg/kg | 8                     | MCERTS                  | < 8.0         |  |  |  |  |
| TPH-CWG - Aliphatic >EC21 - EC35        | mg/kg | 8                     | MCERTS                  | < 8.0         |  |  |  |  |
| TPH-CWG - Aliphatic > EC35 - EC44       | mg/kg | 8.4                   | NONE                    | < 8.4         |  |  |  |  |
| <b>TPH-CWG - Aliphatic (EC5 - EC35)</b> | mg/kg | 10                    | MCERTS                  | < 10          |  |  |  |  |
| <b>TPH-CWG - Aliphatic (EC5 - EC44)</b> | mg/kg | 10                    | NONE                    | < 10          |  |  |  |  |
| TPH-CWG - Aromatic >EC5 - EC7           | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aromatic >EC7 - EC8           | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aromatic >EC8 - EC10          | mg/kg | 0.001                 | MCERTS                  | < 0.001       |  |  |  |  |
| TPH-CWG - Aromatic >EC10 - EC12         | mg/kg | 1                     | MCERTS                  | < 1.0         |  |  |  |  |
| TPH-CWG - Aromatic >EC12 - EC16         | mg/kg | 2                     | MCERTS                  | < 2.0         |  |  |  |  |
| TPH-CWG - Aromatic >EC16 - EC21         | mg/kg | 10                    | MCERTS                  | 12            |  |  |  |  |
| TPH-CWG - Aromatic >EC21 - EC35         | mg/kg | 10                    | MCERTS                  | 13            |  |  |  |  |
| TPH-CWG - Aromatic > EC35 - EC44        | mg/kg | 8.4                   | NONE                    | < 8.4         |  |  |  |  |
| <b>TPH-CWG - Aromatic (EC5 - EC35)</b>  | mg/kg | 10                    | MCERTS                  | 25            |  |  |  |  |
| <b>TPH-CWG - Aromatic (EC5 - EC44)</b>  | mg/kg | 10                    | NONE                    | 25            |  |  |  |  |
| TPH (>C5 - C7)                          | mg/kg | 1                     | MCERTS                  | < 1.0         |  |  |  |  |
| TPH (>C7 - C8)                          | mg/kg | 1                     | MCERTS                  | < 1.0         |  |  |  |  |
| TPH (C8 - C10)                          | mg/kg | 0.1                   | MCERTS                  | < 0.1         |  |  |  |  |
| TPH (C10 - C12)                         | mg/kg | 2                     | MCERTS                  | < 2.0         |  |  |  |  |
| TPH (C12 - C16)                         | mg/kg | 4                     | MCERTS                  | < 4.0         |  |  |  |  |
| TPH (C16 - C21)                         | mg/kg | 1                     | MCERTS                  | 12            |  |  |  |  |
| TPH (C21 - C35)                         | mg/kg | 1                     | MCERTS                  | 13            |  |  |  |  |
| TPH (C35 - C44)                         | mg/kg | 10                    | NONE                    | < 10          |  |  |  |  |
| <b>TPH Total C5 - C44</b>               | mg/kg | 10                    | NONE                    | 25            |  |  |  |  |



**Analytical Report Number : 20-87416**

**Project / Site name: Battle Hospital**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m)     | Sample Description *                 |
|-------------------|------------------|---------------|---------------|--------------------------------------|
| 1444879           | Plot 45          | None Supplied | None Supplied | Brown clay and sand with vegetation. |

**Analytical Report Number : 20-87416**

**Project / Site name: Battle Hospital**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)**

| Analytical Test Name                     | Analytical Method Description                                                                                                                          | Analytical Method Reference                                                          | Method number | Wet / Dry Analysis | Accreditation Status |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Asbestos identification in soil          | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.                                  | In house method based on HSG 248                                                     | A001-PL       | D                  | ISO 17025            |
| Boron, water soluble, in soil            | Determination of water soluble boron in soil by hot water extract followed by ICP-OES.                                                                 | In-house method based on Second Site Properties version 3                            | L038-PL       | D                  | MCERTS               |
| Hexavalent chromium in soil              | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.  | In-house method                                                                      | L080-PL       | W                  | MCERTS               |
| Metals in soil by ICP-OES                | Determination of metals in soil by aqua-regia digestion followed by ICP-OES.                                                                           | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL       | D                  | MCERTS               |
| Moisture Content                         | Moisture content, determined gravimetrically. (30 oC)                                                                                                  | In house method.                                                                     | L019-UK/PL    | W                  | NONE                 |
| pH in soil (automated)                   | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                      | In house method.                                                                     | L099-PL       | D                  | MCERTS               |
| Speciated EPA-16 PAHs in soil            | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270                                                  | L064-PL       | D                  | MCERTS               |
| Stones content of soil                   | Standard preparation for all samples unless otherwise detailed, Gravimetric determination of stone > 10 mm as % dry weight.                            | In-house method based on British Standard Methods and MCERTS requirements.           | L019-UK/PL    | D                  | NONE                 |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.                          | In house method.                                                                     | L009-PL       | D                  | MCERTS               |
| TPH in (Soil)                            | Determination of TPH bands by HS-GC-MS/GC-FID                                                                                                          | In-house method, TPH with carbon banding and silica gel split/cleanup.               | L076-PL       | D                  | NONE                 |
| TPHCWG (Soil)                            | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.                                                                              | In-house method with silica gel split/cleanup.                                       | L088/76-PL    | W                  | MCERTS               |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



**Steve Rhodes**

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## **Analytical Report Number : 20-11091**

|                             |                         |                                                    |            |
|-----------------------------|-------------------------|----------------------------------------------------|------------|
| <b>Project / Site name:</b> | Battle Hospital Reading | <b>Samples received on:</b>                        | 27/05/2020 |
| <b>Your job number:</b>     | CRM 1265 007            | <b>Sample instructed/<br/>Analysis started on:</b> | 27/05/2020 |
| <b>Your order number:</b>   |                         | <b>Analysis completed by:</b>                      | 29/05/2020 |
| <b>Report Issue Number:</b> | 1                       | <b>Report issued on:</b>                           | 29/05/2020 |
| <b>Samples Analysed:</b>    | 2 soil samples          |                                                    |            |

**Signed:** *A. Czerwińska*

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)  
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

|           |                           |
|-----------|---------------------------|
| soils     | - 4 weeks from reporting  |
| leachates | - 2 weeks from reporting  |
| waters    | - 2 weeks from reporting  |
| asbestos  | - 6 months from reporting |

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-11091

Project / Site name: Battle Hospital Reading

|                                         |       |                       |                         |               |               |  |  |  |
|-----------------------------------------|-------|-----------------------|-------------------------|---------------|---------------|--|--|--|
| Lab Sample Number                       |       |                       |                         | 1518059       | 1518060       |  |  |  |
| Sample Reference                        |       |                       |                         | HPK           | HPL           |  |  |  |
| Sample Number                           |       |                       |                         | None Supplied | None Supplied |  |  |  |
| Depth (m)                               |       |                       |                         | 0.00-0.15     | 0.00-0.15     |  |  |  |
| Date Sampled                            |       |                       |                         | 22/05/2020    | 22/05/2020    |  |  |  |
| Time Taken                              |       |                       |                         | None Supplied | None Supplied |  |  |  |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of<br>detection | Accreditation<br>Status |               |               |  |  |  |
| Stone Content                           | %     | 0.1                   | NONE                    | < 0.1         | < 0.1         |  |  |  |
| Moisture Content                        | %     | N/A                   | NONE                    | 15            | 11            |  |  |  |
| Total mass of sample received           | kg    | 0.001                 | NONE                    | 2.0           | 2.0           |  |  |  |

|                  |      |     |           |              |              |  |  |  |
|------------------|------|-----|-----------|--------------|--------------|--|--|--|
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected |  |  |  |
|------------------|------|-----|-----------|--------------|--------------|--|--|--|

#### General Inorganics

|                            |          |     |        |     |     |  |  |  |
|----------------------------|----------|-----|--------|-----|-----|--|--|--|
| pH - Automated             | pH Units | N/A | MCERTS | 8.6 | 8.7 |  |  |  |
| Total Organic Carbon (TOC) | %        | 0.1 | MCERTS | 2.3 | 1.7 |  |  |  |

#### Speciated PAHs

|                        |       |      |        |        |        |  |  |  |
|------------------------|-------|------|--------|--------|--------|--|--|--|
| Naphthalene            | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Acenaphthene           | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Fluorene               | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Phenanthrene           | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Anthracene             | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Fluoranthene           | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Pyrene                 | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Chrysene               | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 |  |  |  |

#### Total PAH

|                             |       |     |        |        |        |  |  |  |
|-----------------------------|-------|-----|--------|--------|--------|--|--|--|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | < 0.80 |  |  |  |
|-----------------------------|-------|-----|--------|--------|--------|--|--|--|

#### Heavy Metals / Metalloids

|                                   |       |     |        |       |       |  |  |  |
|-----------------------------------|-------|-----|--------|-------|-------|--|--|--|
| Arsenic (aqua regia extractable)  | mg/kg | 1   | MCERTS | 8.3   | 3.6   |  |  |  |
| Boron (water soluble)             | mg/kg | 0.2 | MCERTS | 3.1   | 3.3   |  |  |  |
| Cadmium (aqua regia extractable)  | mg/kg | 0.2 | MCERTS | 0.3   | < 0.2 |  |  |  |
| Chromium (hexavalent)             | mg/kg | 4   | MCERTS | < 4.0 | < 4.0 |  |  |  |
| Chromium (aqua regia extractable) | mg/kg | 1   | MCERTS | 20    | 7.5   |  |  |  |
| Copper (aqua regia extractable)   | mg/kg | 1   | MCERTS | 18    | 12    |  |  |  |
| Lead (aqua regia extractable)     | mg/kg | 1   | MCERTS | 39    | 21    |  |  |  |
| Mercury (aqua regia extractable)  | mg/kg | 0.3 | MCERTS | 0.5   | 0.5   |  |  |  |
| Nickel (aqua regia extractable)   | mg/kg | 1   | MCERTS | 12    | 3.7   |  |  |  |
| Selenium (aqua regia extractable) | mg/kg | 1   | MCERTS | < 1.0 | < 1.0 |  |  |  |
| Zinc (aqua regia extractable)     | mg/kg | 1   | MCERTS | 190   | 58    |  |  |  |

#### Petroleum Hydrocarbons

Analytical Report Number: 20-11091

Project / Site name: Battle Hospital Reading

|                                         |       |                       |                         |               |               |  |  |  |
|-----------------------------------------|-------|-----------------------|-------------------------|---------------|---------------|--|--|--|
| Lab Sample Number                       |       |                       |                         | 1518059       | 1518060       |  |  |  |
| Sample Reference                        |       |                       |                         | HPK           | HPL           |  |  |  |
| Sample Number                           |       |                       |                         | None Supplied | None Supplied |  |  |  |
| Depth (m)                               |       |                       |                         | 0.00-0.15     | 0.00-0.15     |  |  |  |
| Date Sampled                            |       |                       |                         | 22/05/2020    | 22/05/2020    |  |  |  |
| Time Taken                              |       |                       |                         | None Supplied | None Supplied |  |  |  |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of<br>detection | Accreditation<br>Status |               |               |  |  |  |
| TPH-CWG - Aliphatic > EC5 - EC6         | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aliphatic > EC6 - EC8         | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aliphatic > EC8 - EC10        | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aliphatic > EC10 - EC12       | mg/kg | 1                     | MCERTS                  | < 1.0         | < 1.0         |  |  |  |
| TPH-CWG - Aliphatic > EC12 - EC16       | mg/kg | 2                     | MCERTS                  | 9.8           | < 2.0         |  |  |  |
| TPH-CWG - Aliphatic > EC16 - EC21       | mg/kg | 8                     | MCERTS                  | 34            | < 8.0         |  |  |  |
| TPH-CWG - Aliphatic > EC21 - EC35       | mg/kg | 8                     | MCERTS                  | 110           | 25            |  |  |  |
| TPH-CWG - Aliphatic > EC35 - EC44       | mg/kg | 8.4                   | NONE                    | 23            | < 8.4         |  |  |  |
| <b>TPH-CWG - Aliphatic (EC5 - EC35)</b> | mg/kg | 10                    | MCERTS                  | 150           | 32            |  |  |  |
| <b>TPH-CWG - Aliphatic (EC5 - EC44)</b> | mg/kg | 10                    | NONE                    | 170           | 32            |  |  |  |
| TPH-CWG - Aromatic > EC5 - EC7          | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aromatic > EC7 - EC8          | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aromatic > EC8 - EC10         | mg/kg | 0.001                 | MCERTS                  | < 0.001       | < 0.001       |  |  |  |
| TPH-CWG - Aromatic > EC10 - EC12        | mg/kg | 1                     | MCERTS                  | < 1.0         | < 1.0         |  |  |  |
| TPH-CWG - Aromatic > EC12 - EC16        | mg/kg | 2                     | MCERTS                  | < 2.0         | < 2.0         |  |  |  |
| TPH-CWG - Aromatic > EC16 - EC21        | mg/kg | 10                    | MCERTS                  | < 10          | < 10          |  |  |  |
| TPH-CWG - Aromatic > EC21 - EC35        | mg/kg | 10                    | MCERTS                  | < 10          | < 10          |  |  |  |
| TPH-CWG - Aromatic > EC35 - EC44        | mg/kg | 8.4                   | NONE                    | < 8.4         | < 8.4         |  |  |  |
| <b>TPH-CWG - Aromatic (EC5 - EC35)</b>  | mg/kg | 10                    | MCERTS                  | < 10          | < 10          |  |  |  |
| <b>TPH-CWG - Aromatic (EC5 - EC44)</b>  | mg/kg | 10                    | NONE                    | < 10          | < 10          |  |  |  |
| TPH (>C5 - C7)                          | mg/kg | 1                     | MCERTS                  | < 1.0         | < 1.0         |  |  |  |
| TPH (>C7 - C8)                          | mg/kg | 1                     | MCERTS                  | < 1.0         | < 1.0         |  |  |  |
| TPH (C8 - C10)                          | mg/kg | 0.1                   | MCERTS                  | < 0.1         | < 0.1         |  |  |  |
| TPH (C10 - C12)                         | mg/kg | 2                     | MCERTS                  | < 2.0         | < 2.0         |  |  |  |
| TPH (C12 - C16)                         | mg/kg | 4                     | MCERTS                  | 9.8           | < 4.0         |  |  |  |
| TPH (C16 - C21)                         | mg/kg | 1                     | MCERTS                  | 34            | 6.8           |  |  |  |
| TPH (C21 - C35)                         | mg/kg | 1                     | MCERTS                  | 110           | 25            |  |  |  |
| TPH (C35 - C44)                         | mg/kg | 10                    | NONE                    | 23            | < 10          |  |  |  |
| <b>TPH Total C5 - C44</b>               | mg/kg | 10                    | NONE                    | 170           | 32            |  |  |  |



**Analytical Report Number : 20-11091**

**Project / Site name: Battle Hospital Reading**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description *        |
|-------------------|------------------|---------------|-----------|-----------------------------|
| 1518059           | HPK              | None Supplied | 0.00-0.15 | Brown sand.                 |
| 1518060           | HPL              | None Supplied | 0.00-0.15 | Brown sand with vegetation. |

**Analytical Report Number : 20-11091**

**Project / Site name: Battle Hospital Reading**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)**

| Analytical Test Name                     | Analytical Method Description                                                                                                                          | Analytical Method Reference                                                          | Method number | Wet / Dry Analysis | Accreditation Status |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Asbestos identification in soil          | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.                                  | In house method based on HSG 248                                                     | A001-PL       | D                  | ISO 17025            |
| Boron, water soluble, in soil            | Determination of water soluble boron in soil by hot water extract followed by ICP-OES.                                                                 | In-house method based on Second Site Properties version 3                            | L038-PL       | D                  | MCERTS               |
| Hexavalent chromium in soil              | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.  | In-house method                                                                      | L080-PL       | W                  | MCERTS               |
| Metals in soil by ICP-OES                | Determination of metals in soil by aqua-regia digestion followed by ICP-OES.                                                                           | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL       | D                  | MCERTS               |
| Moisture Content                         | Moisture content, determined gravimetrically. (30 oC)                                                                                                  | In house method.                                                                     | L019-UK/PL    | W                  | NONE                 |
| pH in soil (automated)                   | Determination of pH in soil by addition of water followed by automated electrometric measurement.                                                      | In house method.                                                                     | L099-PL       | D                  | MCERTS               |
| Speciated EPA-16 PAHs in soil            | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270                                                  | L064-PL       | D                  | MCERTS               |
| Stones content of soil                   | Standard preparation for all samples unless otherwise detailed, Gravimetric determination of stone > 10 mm as % dry weight.                            | In-house method based on British Standard Methods and MCERTS requirements.           | L019-UK/PL    | D                  | NONE                 |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.                          | In house method.                                                                     | L009-PL       | D                  | MCERTS               |
| TPH in (Soil)                            | Determination of TPH bands by HS-GC-MS/GC-FID                                                                                                          | In-house method, TPH with carbon banding and silica gel split/cleanup.               | L076-PL       | D                  | NONE                 |
| TPHCWG (Soil)                            | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.                                                                              | In-house method with silica gel split/cleanup.                                       | L088/76-PL    | W                  | MCERTS               |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

Jack Johnson  
Bellway Homes Ltd  
Pacific House,  
Imperial Way,  
Reading,  
RG2 0TD  
Bicester, OX27 8TG

Our Ref: CRM.1265.007.GE.L.002.A

17 July 2020

Sent via email ([jack.johnson@bellway.co.uk](mailto:jack.johnson@bellway.co.uk))

Dear Jack

**Battle Hospital, Portman Way, Reading, RG30 1AH – HPI & HPJ**

**Background**

Phase I Desk Study and Subsequent Phase II Intrusive Ground Investigation were undertaken at the above-named site by RSK Environmental Limited in March 2017. Visual and olfactory evidence of contamination by hydrocarbons, solvents and a sulphurous odour were noted during the site investigation. Chemical analysis showed exceedance of the reference values for Lead, Polycyclic Aromatic Hydrocarbons (PAH) Hydrocarbons within Made Ground. Asbestos fibres were also detected.

As the site is being re-developed for residential apartments with communal garden areas and private housing, remediation to areas of soft landscaping was proposed. This would comprise 300mm clean materials over a Geotextile no-dig barrier within communal garden areas, and 600mm clean materials over a Geotextile no-dig barrier within private gardens. This was submitted to Reading Borough Council in Remedial Methodology Strategy – CRM.1265.007.GE.R.002.A. and was approved. During the works, no subsequent site observations indicated any change was required.

**Site Inspection**

On the 25<sup>th</sup> February 2020 Enzygo Geo Environmental Limited undertook a site inspection to excavate two hand pits (HPI and HPJ) to confirm the presence of a Geotextile no-dig barrier beneath 600mm clean materials. The locations of the Hand Pits are shown on drawing CRM.1265.007.GE.D.001 in Appendix B.

**Cover Soils**

Hand Pits confirmed the presence of 600mm of cover soils over a Geotextile no dig barrier, meeting the required depth for residential use with plant uptake. Photographs of the hand pits are included in Appendix A. Samples were recovered from the Hand Pits and submitted to the laboratories of I2 who are UKAS and MCERTS accredited for testing.

## Chemical Analysis

Chemical analysis reports have been supplied by the client prior to the materials being imported to site. These certificates meet the GAC values for residential use with plant uptake. No asbestos was detected. These are included in Appendix C.

Soil samples from the validation pits were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that is cleaned at each sampling location.

Soil samples we sent to the laboratories of I2 who are UKAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH CWG) and asbestos screen.

Results show the materials used meet the GAC values for residential use with plant uptake. These are shown in Appendix D

## Conclusion

Based on the site inspection undertaken, information provided and results it is considered that the cover soils within Hand Pits HPI and HPJ are in accordance with the approved Remedial Methodology.

We hope that we have correctly interpreted your requirements.

Yours sincerely,  
For and on behalf of Enzygo



Richard Reece  
**Senior Technician**

## APPENDIX A – PHOTOGRAPHS

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## HPI



## HPJ



## **APPENDIX B – DRAWING**

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#### Key

- Site Boundary
- Verification Pits in Communal Areas (HP)  
(HP1 - HP8)
- Verification Pits in Gardens (HP)  
(HPA - HPJ)



Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT:  
**Bellway Homes Limited**  
(Thames Valley)

SCALE: 1:1,000@A3 PROJECT REF: CRM.1265.007

DRAWN: NP CHECKED: SR DATE: July 2018

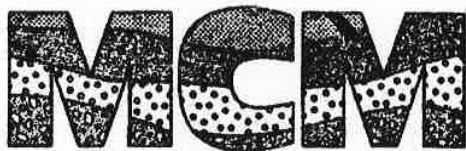
PROJECT:  
**Portman Way, Reading**

TITLE:  
**Site Location Plan**

FIGURE NO:  
**CRM.1265.007.GE.D.001**

## **APPENDIX C IMPORTED SOILS CHEMICAL ANALYSIS**

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020 8339 9909

Freeland Horticulture Ltd

Rosedale Nursery  
College Road  
Hextable  
Kent  
BR8 7LT

**Freeland**  
HORTICULTURE LIMITED

Attention: Philippa Lambourne

Our Ref: 816-SA

16 January 2020

Dear Philippa

**Topsoil Analysis Report : Beenham Topsoil –January 2020**

We have completed the analysis of the topsoil sample recently taken from the above site and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes.

**SOIL SAMPLING & EXAMINATION**

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as a dark brown, slightly moist, friable *loamy sand* with a well developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

**LABORATORY ANALYSIS**

The topsoil sample was submitted to a UKAS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- ✦ pH & electrical conductivity values;
- ✦ major plant nutrients (N, P, K, Mg) & organic matter content;
- ✦ particle size distribution and stone content;
- ✦ heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- ✦ sulphate, sulphur, sulphide;
- ✦ total cyanide and total (mono) phenols;
- ✦ speciated PAHs (US EPA16);
- ✦ banded aromatic and aliphatic petroleum hydrocarbons (C<sub>6</sub>-C<sub>35</sub>).
- ✦ Asbestos

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Phone: 01322 619161

## COMMENTS

### **pH & Electrical Conductivity (salinity) Values**

The sample was alkaline in reaction (pH 8.5) with a pH value that would be suitable for general landscaping purposes.

The electrical conductivity value using the soil:water extract was moderate (1395/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

### **Organic Matter & Nutrient Status**

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

### **Particle Size Distribution & Stone Content**

The sample contained 85% sand and fell into the *loamy sand* texture class. Suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding. As such, we would not consider this sand level to be problematic.

The sample was free from stones of 20 mm and upwards in diameter and only contained a slight fraction of smaller stones (4.4%). As such, stones will not restrict the use of the soil for landscaping purposes.

### **Potential Contaminants**

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil so the following comments are based on the Soil Guideline Values (SGVs) for residential end-use presented in the Contaminated Land Exposure Assessment (CLEA) Model (EA/DEFRA:2002). The SGVs currently only consider a limited range of parameters so where a potential contaminant is not covered by the CLEA Model other relevant schedules for contamination assessment, such as the Dutch Guidelines, and professional judgement have been used.

Of the potential contaminants determined, none was found at levels that would indicate significant contamination.

## CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, sandy sand. The organic matter and nutrient levels are acceptable, and no significant contamination was found with respect to the parameters determined and the sand content would not be considered problematic. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.