



## Verification Report

Prepared For: Manning Construction

Issue Date: May 2023

Job No: 15710/VR

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|          | Name                                            | Signature                                                                             |
|----------|-------------------------------------------------|---------------------------------------------------------------------------------------|
| Prepared | <b>Alan Beattie</b><br>M.Sci (Hons), FGS        |  |
| Checked  | <b>Mathew Lake</b><br>MEng FGS Tech IOSH        |   |
| Approved | <b>Gwyn Lake</b><br>BSc (Hons). PhD, CGeol, FGS |  |



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## SECTION 1 Introduction and Proposed Development

### 1.1 Introduction

Manning Construction Limited has developed residential housing on land adjacent to Park Avenue, Glynneath.

TFW Group Limited have been commissioned by the Client to prepare a Validation Report for the site.

Previous investigations and assessments have identified that remediation of contamination is required for the development. This report presents a Remediation Strategy for the site based on these previous investigations and assessments.

### 1.2 Objectives

The objective of the Validation Report is to summarise the remedial steps that are required to render the site fit for its intended use and confirm, these measures have been undertaken.

### 1.3 Previous Investigations and Assessments

The Validation Report is based on the findings of previous investigations and assessments. This report shall be read in conjunction with the following documents.

*Geotechnical and Geoenvironmental Report 15710/2 (Terra Firma Wales Ltd, September 2020)*

*Remediation Strategy Report 15710/RS/3 (Terra Firma Wales Ltd, June 2021)*

### 1.4 Roles and Responsibilities

**Table 1.1 Roles and Responsibilities**

| Role                                       | Organisation                                 |
|--------------------------------------------|----------------------------------------------|
| Client                                     | Manning Construction Limited                 |
| Local Authority                            | Neath and Port Talbot County Borough Council |
| Geotechnical & Geoenvironmental Consultant | Terra Firma Wales Ltd                        |
| Validator                                  | Terra Firma Wales Ltd                        |

### 1.5 Limitations and Exceptions of Investigation

This report has been prepared for the sole internal reliance of the Client and its design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Limited. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geo-environmental and geotechnical consultants. TFW Group Limited does not provide legal advice and the advice of lawyers may be required.

It is not within the scope of Terra Firma (Wales) Limited to:

- Provide Method Statements and Risk Assessments for the site remediation, preparation and development.
- Design, assess or install utility service trench fill and pipes for potable water supply beneath the site.



## **1.6 Quality Assurance**

The quality and environmental aspects of the assessment and investigation comply with UKAS Accredited ISO 9001:2015 and ISO 14001:2015 standards.

## SECTION 2 Site Characteristics

The following subsection information has been summarised from previous investigation and assessments listed in **Section 1.3**.

### 2.1 Site Location and Description

The development site is irregular in shape and locates adjacent to Park Avenue, Glynneath. The site centres on an approximate National Grid Reference of 287770, 206560, occupying a plan area of approximately 0.8 Hectares.

Then site rises slightly to the north. An area of tarmac locates in the south of the site and rough vegetation locate further north. The demolished remains of the former club house lie within the site.

A park locates to the west of the site and the rear of housing locates to the east of the site.

The site elevation is approximately 55m AOD.

The site location can be seen on Figure 2.1.



Figure 2.1 Site Location

### 2.2 Site History Summary

The site has historically contained a welfare hall, which was demolished after 2010.

## 2.3 Geology and Ground Conditions

The 1:10,560 scale British Geological Map of the area (Sheet SN 80 NE, 1966) was consulted for geology underlying the site. The site is shown to be underlain by Rocks of the Lower Coal Measures, near the conjectured outcrop of the Gnaipog (Garw) Coal Seam. This seam is recorded as 'thin'.

Bedrock is shown to have a superficial cover of Recent- Pleistocene alluvium.

The ground conditions encountered during the site investigation can in general be summarised as shown in **Table 2.1**.

**Table 2.1 Summary of Ground Conditions**

| Depth (m) |   |         | Thickness (m) | Stratum                                                                                                                                                                                                                                                        |
|-----------|---|---------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.0       | - | 0.3/0.9 | 0.3/0.9       | <b>MADE GROUND:</b> Typically soft, sandy gravelly <b>SILT/CLAY</b> to silty sandy <b>GRAVEL</b> to <b>BOULDERS</b> to limestone aggregate to sandy <b>SILT</b> , to sandy <b>GRAVEL</b> to <b>COBBLE</b> including brick and concrete (May be deeper locally) |
| 0.0/0.9   | - | >2.0    |               | <b>SUPERFICIAL:</b> Variable ranging from Firm to stiff sandy gravelly <b>SILT/CLAY</b> to medium dense to dense <b>GRAVEL</b> to <b>BOULDERS</b>                                                                                                              |

## 2.4 Radon

A British Geological Survey Radon Report identified that **Basic** Radon Protection is required at the site.

## 2.5 Hydrogeology and Hydrology

The nearest surface water feature comprises a stream immediately west of the site.

Superficial deposits beneath the site have an aquifer designation of secondary aquifer – A. The bedrock deposits beneath the site have an aquifer designation of secondary aquifer – A.

Deeper groundwater flow within the underlying bedrock will be controlled by the strata dip and any fractures or bedding planes within the rock units.

The hydraulic gradient will be at its steepest during periods of heavy rainfall and aquifer recharge.

Groundwater was not recorded in exploratory holes.

## 2.6 Identified Contamination

### 2.6.1 Made Ground Soils

Laboratory soil test results highlight exceedances of arsenic, naphthalene, benzo(a)anthracene, chrysene, benzo(a)pyrene and dibenzo(ah)anthracene within made ground when compared to human health guidelines for a residential with plant uptake scenario.

The location containing naphthalene, the only volatile species to exceed guidelines, was excavated out for off-site disposal in 2014, therefore, all remaining exceedances can be considered non-volatile.

## **2.6.2 Ground Gasses**

Basic Radon Protection has been recommended for the site. To mitigate against the risk to future site users from radon gas, basic protection measures will be required in all structures. Reference should be made to guidance publication BR 211:2015 for further details on required protection elements.

### SECTION 3 Sources of Contamination Requiring Remediation

The summary of the refined conceptual site model is presented in **Table 3.1** and based on findings of previous investigations and assessments, detailing significant pollutant linkages requiring remediation or mitigation.

**Table 3.1 Summary of Significant Pollutant Linkages**

| Source                   | Pathway                                                  | Receptor                             |
|--------------------------|----------------------------------------------------------|--------------------------------------|
| Contaminated Made Ground | Dermal Contact/Inhalation of Dust/Ingestion              | Groundworkers                        |
| Contaminated Made Ground | Dermal Contact/Inhalation of Dust/Ingestion              | Neighbouring Sites during Earthworks |
| Contaminated Made Ground | Dermal Contact/Inhalation of Dust/Ingestion/Plant Uptake | Future Site Occupiers / Visitors     |
| Bedrock                  | Inhalation of Radon Gas                                  | Future Site Occupiers / Visitors     |



## **SECTION 4 Proposed Remedial and Mitigating Measures**

### **4.1 General**

Based on the finding of previous investigations and assessments and the identified pollutant linkages the following remedial measures have been devised for the site.

Specific validation requirements for the proposed remedial measures are discussed in the following section.

### **4.2 Made Ground Soils**

#### **4.2.1 Protection of Future Site Users (Residents)**

Future site users will be potentially at risk from direct soil and dust ingestion, dermal contact and inhalation of dust from soils containing contaminants, during excavation of made ground soils while undertaking gardening activities. Future site users are also at risk from the consumption of home grown produce grown within contaminated made ground soils.

Complete removal of the contaminant source would prove to be uneconomical given the low level of risk identified and the volume of affected soils therefore the installation of a capping system is proposed to interrupt the link between the source and receptor.

The capping system should be installed above Made Ground soils only in garden and landscaped areas and comprise 600mm thick capping layer of imported clean inert soils or suitable site won natural soil conforming to GACs.

Beneath areas of the site due to be covered by hard-standing or developed upon, we anticipate no remedial measures are required.

**Validation of the capping system and imported materials will be required.**

#### **4.2.2 Protection of Construction Materials (Potable Water Pipes)**

Potable water supply pipes are at risk of degradation when in contact with made ground soils containing contaminants.

**It is recommended that a Potable Water Supplier should complete an assessment in accordance with UK Water Industry Research guidance; Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites, UKWIR Report Ref: 10/WM/03/21. The assessment should determine the selection of Water Supply Pipe material.**

**The potable water supplier, or their nominated contractor should undertake the assessment prior to connection. Records should be retained for the validation report.**

### **4.3 Radon Gas**

#### **4.3.1 Protection of Future Site Users (Residents)**

To mitigate against the risk to future site users from radon gas, basic protection measures will be required in all structures. Reference should be made to guidance publication BR 211:2015 for further details on required protection elements. Verification of the installed protection measures is highly recommended.

## SECTION 5 Validation of Remedial / Mitigation Works

### 5.1 Capping System

On the 7<sup>th</sup> of March 2023 TFW Group attended site and collected 5 No. samples of capping soil from Plots 2/4/6/8/10. TFW Group confirmed the capping soil was at least 600mm thick. The results of the chemical analysis are presented in **Table 5.1**.

**Table 5.1 Soil Chemical Analysis**

| Client: Terra Firma (Wales) Ltd |         |      |       |       | Chemtest Job No.:    | 23-08019             | 23-08019             | 23-07962             | 23-07962             | 23-07962             |
|---------------------------------|---------|------|-------|-------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Quotation No.:                  |         |      |       |       | Chemtest Sample ID.: | 1604411              | 1604412              | 1604125              | 1604126              | 1604127              |
|                                 |         |      |       |       | Sample Location:     | Plot 2               | Plot 4               | Plot 6               | Plot 8               | Plot 10              |
|                                 |         |      |       |       | Sample Type:         | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 |
|                                 |         |      |       |       | Top Depth (m):       | 0                    | 0                    | 0                    | 0                    | 0                    |
|                                 |         |      |       |       | Bottom Depth (m):    | 0.6                  | 0.6                  | 0.6                  | 0.6                  | 0.6                  |
|                                 |         |      |       |       | Date Sampled:        |                      |                      |                      |                      |                      |
|                                 |         |      |       |       | Asbestos Lab:        | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               |
| Determinand                     | Accred. | SOP  | Units | LOD   | Guideline            |                      |                      |                      |                      |                      |
| ACM Type                        | U       | 2192 |       | N/A   |                      | -                    | -                    | -                    | -                    | -                    |
| Asbestos Identification         | U       | 2192 |       | N/A   |                      | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage             | U       | 2192 |       | N/A   |                      | -                    | -                    | -                    | -                    | -                    |
| Moisture                        | N       | 2030 | %     | 0.020 |                      | 18                   | 19                   | 19                   | 20                   | 22                   |
| Soil Colour                     | N       | 2040 |       | N/A   |                      | Brown                | Brown                | Brown                | Brown                | Brown                |
| Other Material                  | N       | 2040 |       | N/A   |                      | Roots and Stones     | Roots                | Roots                | Roots                | Roots                |
| Soil Texture                    | N       | 2040 |       | N/A   |                      | Sand                 | Loam                 | Loam                 | Loam                 | Sand                 |
| pH                              | M       | 2010 |       | 4.0   |                      | 8.6                  | 8.7                  | 8.7                  | 8.6                  | 8.6                  |
| Boron (Hot Water Soluble)       | M       | 2120 | mg/kg | 0.40  | 290                  | 0.79                 | 0.78                 | 2.4                  | 1.2                  | 1.2                  |
| Cyanide (Total)                 | M       | 2300 | mg/kg | 0.50  | 8                    | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Sulphate (Acid Soluble)         | U       | 2430 | %     | 0.010 |                      | 0.034                | 0.065                | 0.053                | 0.063                | 0.046                |
| Arsenic                         | M       | 2455 | mg/kg | 0.5   | 37                   | 6.3                  | 7.1                  | 5.8                  | 5.8                  | 7.5                  |
| Cadmium                         | M       | 2455 | mg/kg | 0.10  | 11                   | 0.15                 | 0.18                 | 0.14                 | 0.13                 | 0.15                 |
| Chromium                        | M       | 2455 | mg/kg | 0.5   |                      | 10                   | 11                   | 8.5                  | 9.4                  | 9.1                  |
| Mercury Low Level               | M       | 2450 | mg/kg | 0.05  | 40                   | < 0.05               | < 0.05               | 0.05                 | 0.05                 | < 0.05               |
| Copper                          | M       | 2455 | mg/kg | 0.50  | 2400                 | 11                   | 12                   | 12                   | 12                   | 9.4                  |
| Nickel                          | M       | 2455 | mg/kg | 0.50  | 130                  | 7.8                  | 8.5                  | 7.7                  | 7.5                  | 8.9                  |
| Lead                            | M       | 2455 | mg/kg | 0.50  | 200                  | 18                   | 20                   | 16                   | 21                   | 15                   |
| Selenium                        | M       | 2455 | mg/kg | 0.25  | 250                  | 0.30                 | 0.36                 | 0.30                 | 0.30                 | 0.36                 |
| Zinc                            | M       | 2455 | mg/kg | 0.50  | 3700                 | 38                   | 46                   | 38                   | 43                   | 36                   |
| Chromium (Trivalent)            | N       | 2490 | mg/kg | 1.0   | 910                  | 10                   | 11                   | 8.5                  | 9.4                  | 9.1                  |
| Chromium (Hexavalent)           | N       | 2490 | mg/kg | 0.50  | 6                    | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Aliphatic VPH >C5-C6            | M       | 2780 | mg/kg | 0.05  | 42                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7            | M       | 2780 | mg/kg | 0.05  | 100                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8            | M       | 2780 | mg/kg | 0.05  | 100                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C8-C10           | M       | 2780 | mg/kg | 0.05  | 27                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10     | M       | 2780 | mg/kg | 0.25  |                      | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12          | M       | 2690 | mg/kg | 2.00  | 130                  | 2.5                  | < 2.0                | 2.3                  | 2.3                  | 2.3                  |
| Aliphatic EPH >C12-C16          | M       | 2690 | mg/kg | 1.00  | 1100                 | 5.4                  | 3.9                  | 2.1                  | 2.5                  | 1.7                  |
| Aliphatic EPH >C16-C21          | M       | 2690 | mg/kg | 2.00  | 65000                | 7.3                  | 4.6                  | 3.4                  | 3.8                  | 5.2                  |
| Aliphatic EPH >C21-C35          | M       | 2690 | mg/kg | 3.00  | 65000                | 11                   | 7.3                  | 5.2                  | 6.5                  | 7.4                  |
| Aliphatic EPH >C35-C40          | N       | 2690 | mg/kg | 10.00 | 65000                | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35    | M       | 2690 | mg/kg | 5.00  |                      | 26                   | 18                   | 13                   | 15                   | 17                   |
| Aromatic VPH >C5-C7             | M       | 2780 | mg/kg | 0.05  | 70                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8             | M       | 2780 | mg/kg | 0.05  | 130                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10            | M       | 2780 | mg/kg | 0.05  | 34                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Total Aromatic VPH >C5-C10      | M       | 2780 | mg/kg | 0.25  |                      | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aromatic EPH >C10-C12           | M       | 2690 | mg/kg | 1.00  | 74                   | 12                   | 12                   | 6.9                  | 3.9                  | 7.8                  |
| Aromatic EPH >C12-C16           | M       | 2690 | mg/kg | 1.00  | 140                  | 19                   | 19                   | 9.1                  | 12                   | 5.8                  |
| Aromatic EPH >C16-C21           | N       | 2690 | mg/kg | 2.00  | 260                  | 23                   | 23                   | 13                   | 13                   | 16                   |
| Aromatic EPH >C21-C35           | M       | 2690 | mg/kg | 2.00  | 1100                 | 120                  | 100                  | 47                   | 68                   | 75                   |
| Aromatic EPH >C35-C40           | N       | 2690 | mg/kg | 1.00  | 1100                 | 15                   | 13                   | 9.0                  | 10                   | 11                   |
| Total Aromatic EPH >C10-C35     | M       | 2690 | mg/kg | 5.00  |                      | 170                  | 150                  | 77                   | 97                   | 100                  |
| Total VPH >C5-C10               | M       | 2780 | mg/kg | 0.50  |                      | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Total EPH >C10-C35              | M       | 2690 | mg/kg | 10.00 |                      | 200                  | 170                  | 90                   | 110                  | 120                  |
| Naphthalene                     | M       | 2800 | mg/kg | 0.10  | 2.3                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | 0.12                 |
| Acenaphthylene                  | N       | 2800 | mg/kg | 0.10  | 170                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Acenaphthene                    | M       | 2800 | mg/kg | 0.10  | 210                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Fluorene                        | M       | 2800 | mg/kg | 0.10  | 170                  | < 0.10               | < 0.10               | < 0.10               | 0.13                 | < 0.10               |
| Phenanthrene                    | M       | 2800 | mg/kg | 0.10  | 95                   | < 0.10               | < 0.10               | < 0.10               | 0.27                 | 0.17                 |
| Anthracene                      | M       | 2800 | mg/kg | 0.10  | 2400                 | < 0.10               | < 0.10               | < 0.10               | 0.21                 | 0.24                 |
| Fluoranthene                    | M       | 2800 | mg/kg | 0.10  | 280                  | 0.13                 | 0.20                 | 0.18                 | 0.39                 | 0.36                 |
| Pyrene                          | M       | 2800 | mg/kg | 0.10  | 620                  | 0.10                 | 0.15                 | 0.14                 | 0.36                 | 0.38                 |
| Benzo[a]anthracene              | M       | 2800 | mg/kg | 0.10  | 7.2                  | < 0.10               | < 0.10               | < 0.10               | 0.35                 | 0.51                 |
| Chrysene                        | M       | 2800 | mg/kg | 0.10  | 15                   | < 0.10               | < 0.10               | 0.11                 | 0.30                 | 0.66                 |
| Benzo[b]fluoranthene            | M       | 2800 | mg/kg | 0.10  | 2.6                  | < 0.10               | < 0.10               | 0.18                 | 0.43                 | 0.40                 |
| Benzo[k]fluoranthene            | M       | 2800 | mg/kg | 0.10  | 77                   | < 0.10               | < 0.10               | < 0.10               | 0.28                 | 0.43                 |
| Benzo[a]pyrene                  | M       | 2800 | mg/kg | 0.10  | 2.2                  | < 0.10               | < 0.10               | < 0.10               | 0.33                 | 0.50                 |
| Indeno(1,2,3-c,d)Pyrene         | M       | 2800 | mg/kg | 0.10  | 27                   | < 0.10               | < 0.10               | < 0.10               | 0.31                 | 0.48                 |
| Dibenz(a,h)Anthracene           | N       | 2800 | mg/kg | 0.10  | 0.24                 | < 0.10               | < 0.10               | < 0.10               | 0.28                 | 0.56                 |
| Benzo[g,h,i]perylene            | M       | 2800 | mg/kg | 0.10  | 320                  | < 0.10               | < 0.10               | < 0.10               | 0.34                 | 0.41                 |
| Total Of 16 PAH's               | N       | 2800 | mg/kg | 2.0   |                      | < 2.0                | < 2.0                | < 2.0                | 4.0                  | 5.2                  |
| Total Phenols                   | M       | 2920 | mg/kg | 0.10  | 120                  | 1.7                  | 0.50                 | 0.17                 | 0.14                 | < 0.10               |
| Organic Matter BS1377           | N       | 2930 | %     | 0.10  |                      | 1.5                  | 3.6                  | 2.6                  | 2.9                  | 3.2                  |

A dibenzo(ah)anthracene concentration of 0.28 mg/kg was recorded in Plot 8. The sample was seen to have a Soil Organic Matter (SOM) of 2.9%. For soil with an SOM of >2.5% a GAC of 0.28mg/kg can be used. When the SOM corrected GAC is used for the sample from Plot 8 it is not considered an exceedance. The soil chemical test results from the 7<sup>th</sup> of March 2023 can be found in **Annex A**.

On the 20<sup>th</sup> of April 2023, a return visit was made to the site. Samples were collected from Plot 1/3/5/7/9 (the previously unsampled plots) and three additional samples were collected from Plot 10 where an exceedance of dibenzo(ah)anthracene was recorded. The results of the chemical analysis are presented in **Table 5.2**.

**Table 5.2 Soil Chemical Analysis**

| Client: Terra Firma (Wales) Ltd |         |      |       |       | 23-13359             | 23-13359             | 23-13359             | 23-13359             | 23-13359             | 23-13359             | 23-13359             | 23-13359             |
|---------------------------------|---------|------|-------|-------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Chemtest Job No.:               |         |      |       |       | 1628155              | 1628156              | 1628157              | 1628158              | 1628159              | 1628160              | 1628161              | 1628162              |
| Chemtest Sample ID.:            |         |      |       |       | PLOT 1               | PLOT 3               | PLOT 5               | PLOT 7               | PLOT 9               | PLOT 10 S1           | PLOT 10 S2           | PLOT 10 S3           |
| Client Sample ID.:              |         |      |       |       | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 |
| Sample Type:                    |         |      |       |       | 0.30                 | 0.30                 | 0.30                 | 0.30                 | 0.30                 | 0.30                 | 0.50                 | 0.20                 |
| Top Depth (m):                  |         |      |       |       | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          | 20-Apr-2023          |
| Date Sampled:                   |         |      |       |       | 12:00                | 12:00                | 12:00                | 12:00                | 12:00                | 12:00                | 12:00                | 12:00                |
| Time Sampled:                   |         |      |       |       | COVENTRY             | COVENTRY             | COVENTRY             | COVENTRY             | COVENTRY             | COVENTRY             | COVENTRY             | COVENTRY             |
| Asbestos Lab:                   |         |      |       |       |                      |                      |                      |                      |                      |                      |                      |                      |
| Determinand                     | Accred. | SOP  | Units | LOD   |                      |                      |                      |                      |                      |                      |                      |                      |
| ACM Type                        | U       | 2192 |       | N/A   | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    |
| Asbestos Identification         | U       | 2192 |       | N/A   | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage             | U       | 2192 |       | N/A   | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    |
| Moisture                        | N       | 2030 | %     | 0.020 | 16                   | 18                   | 17                   | 13                   | 16                   | 14                   | 17                   | 16                   |
| Soil Colour                     | N       | 2040 |       | N/A   | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                |
| Other Material                  | N       | 2040 |       | N/A   | Stones and Roots     | Stones and Roots     | Stones and Roots     | Stones               | Stones and Roots     | Stones               | Stones               | Stones and Roots     |
| Soil Texture                    | N       | 2040 |       | N/A   | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 |
| pH                              | M       | 2010 |       | 4.0   | 8.2                  | 8.4                  | 8.3                  | 8.3                  | 8.3                  | 8.2                  | 8.2                  | 8.1                  |
| Boron (Hot Water Soluble)       | M       | 2120 | mg/kg | 0.40  | 290                  | 1.2                  | 0.98                 | 0.84                 | 1.0                  | 0.46                 | 0.66                 | 0.89                 |
| Cyanide (Total)                 | M       | 2300 | mg/kg | 0.50  | 8                    | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Sulphate (Acid Soluble)         | U       | 2430 | %     | 0.010 | 0.046                | 0.043                | 0.039                | 0.036                | 0.038                | 0.044                | 0.034                | 0.030                |
| Arsenic                         | M       | 2455 | mg/kg | 0.5   | 37                   | 6.2                  | 5.7                  | 5.4                  | 5.2                  | 5.9                  | 5.6                  | 5.7                  |
| Cadmium                         | M       | 2455 | mg/kg | 0.10  | 11                   | 0.16                 | 0.16                 | 0.14                 | 0.14                 | 0.15                 | 0.14                 | 0.17                 |
| Chromium                        | M       | 2455 | mg/kg | 0.5   |                      | 11                   | 9.5                  | 9.8                  | 9.5                  | 9.6                  | 9.9                  | 13                   |
| Mercury Low Level               | M       | 2450 | mg/kg | 0.05  | 40                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Copper                          | M       | 2455 | mg/kg | 0.50  | 2400                 | 12                   | 10                   | 10                   | 13                   | 11                   | 10                   | 13                   |
| Nickel                          | M       | 2455 | mg/kg | 0.50  | 130                  | 8.3                  | 7.5                  | 7.3                  | 6.9                  | 7.3                  | 7.2                  | 8.0                  |
| Lead                            | M       | 2455 | mg/kg | 0.50  | 200                  | 21                   | 19                   | 18                   | 15                   | 17                   | 16                   | 19                   |
| Selenium                        | M       | 2455 | mg/kg | 0.25  | 250                  | 0.33                 | 0.29                 | 0.28                 | 0.26                 | 0.29                 | 0.25                 | 0.32                 |
| Zinc                            | M       | 2455 | mg/kg | 0.50  | 3700                 | 36                   | 34                   | 33                   | 32                   | 36                   | 35                   | 36                   |
| Chromium (Trivalent)            | N       | 2490 | mg/kg | 1.0   | 910                  | 11                   | 9.5                  | 9.8                  | 9.5                  | 9.6                  | 9.9                  | 13                   |
| Chromium (Hexavalent)           | N       | 2490 | mg/kg | 0.50  | 6                    | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Aliphatic VPH >C5-C6            | M       | 2780 | mg/kg | 0.05  | 42                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7            | M       | 2780 | mg/kg | 0.05  | 100                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8            | M       | 2780 | mg/kg | 0.05  | 100                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C8-C10           | M       | 2780 | mg/kg | 0.05  | 27                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | 0.12                 | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10     | M       | 2780 | mg/kg | 0.25  |                      | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12          | M       | 2690 | mg/kg | 2.00  | 130                  | 2.9                  | 2.8                  | 2.4                  | 2.5                  | 2.9                  | < 2.0                | 2.2                  |
| Aliphatic EPH >C12-C16          | M       | 2690 | mg/kg | 1.00  | 1100                 | 3.2                  | 3.7                  | 2.1                  | 1.8                  | 1.9                  | 2.3                  | 2.1                  |
| Aliphatic EPH >C16-C21          | M       | 2690 | mg/kg | 2.00  | 65000                | 4.4                  | 3.1                  | 3.5                  | < 2.0                | 7.2                  | 3.0                  | 4.7                  |
| Aliphatic EPH >C21-C35          | M       | 2690 | mg/kg | 3.00  | 65000                | 10                   | 7.7                  | 8.8                  | 3.8                  | 16                   | 7.0                  | 9.1                  |
| Aliphatic EPH >C35-C40          | N       | 2690 | mg/kg | 10.00 | 65000                | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35    | M       | 2690 | mg/kg | 5.00  |                      | 21                   | 17                   | 17                   | 9.4                  | 28                   | 14                   | 18                   |
| Aromatic VPH >C5-C7             | M       | 2780 | mg/kg | 0.05  | 70                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8             | M       | 2780 | mg/kg | 0.05  | 130                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10            | M       | 2780 | mg/kg | 0.05  | 34                   | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Total Aromatic VPH >C5-C10      | M       | 2780 | mg/kg | 0.25  |                      | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aromatic EPH >C10-C12           | M       | 2690 | mg/kg | 1.00  | 74                   | 17                   | 16                   | 17                   | 15                   | 16                   | 8.4                  | 8.6                  |
| Aromatic EPH >C12-C16           | M       | 2690 | mg/kg | 1.00  | 140                  | 15                   | 19                   | 16                   | 15                   | 17                   | 14                   | 18                   |
| Aromatic EPH >C16-C21           | N       | 2690 | mg/kg | 2.00  | 260                  | 13                   | 11                   | 13                   | 12                   | 14                   | 17                   | 19                   |
| Aromatic EPH >C21-C35           | M       | 2690 | mg/kg | 2.00  | 1100                 | 67                   | 21                   | 60                   | 7.9                  | 110                  | 35                   | 64                   |
| Aromatic EPH >C35-C40           | N       | 2690 | mg/kg | 1.00  | 1100                 | 10                   | 7.8                  | 13                   | 5.6                  | 14                   | 8.7                  | 13                   |
| Total Aromatic EPH >C10-C35     | M       | 2690 | mg/kg | 5.00  |                      | 110                  | 66                   | 110                  | 49                   | 160                  | 74                   | 110                  |
| Total VPH >C5-C10               | M       | 2780 | mg/kg | 0.50  |                      | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Total EPH >C10-C35              | M       | 2690 | mg/kg | 10.00 |                      | 130                  | 84                   | 120                  | 58                   | 190                  | 87                   | 130                  |
| Naphthalene                     | M       | 2800 | mg/kg | 0.10  | 2.3                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Acenaphthylene                  | N       | 2800 | mg/kg | 0.10  | 170                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Acenaphthene                    | M       | 2800 | mg/kg | 0.10  | 210                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Fluorene                        | M       | 2800 | mg/kg | 0.10  | 170                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Phenanthrene                    | M       | 2800 | mg/kg | 0.10  | 95                   | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Anthracene                      | M       | 2800 | mg/kg | 0.10  | 2400                 | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Fluoranthene                    | M       | 2800 | mg/kg | 0.10  | 280                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Pyrene                          | M       | 2800 | mg/kg | 0.10  | 620                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Benzo[a]anthracene              | M       | 2800 | mg/kg | 0.10  | 7.2                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Chrysene                        | M       | 2800 | mg/kg | 0.10  | 15                   | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Benzo[b]fluoranthene            | M       | 2800 | mg/kg | 0.10  | 2.6                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Benzo[k]fluoranthene            | M       | 2800 | mg/kg | 0.10  | 77                   | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Benzo[a]pyrene                  | M       | 2800 | mg/kg | 0.10  | 2.2                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Indeno[1,2,3-c,d]Pyrene         | M       | 2800 | mg/kg | 0.10  | 27                   | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Dibenzo[a,h]Anthracene          | N       | 2800 | mg/kg | 0.10  | 0.24                 | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Benzo[g,h,i]perylene            | M       | 2800 | mg/kg | 0.10  | 320                  | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Total Of 16 PAH's               | N       | 2800 | mg/kg | 2.0   |                      | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                |
| Total Phenols                   | M       | 2920 | mg/kg | 0.10  | 120                  | 0.15                 | < 0.10               | < 0.10               | 0.13                 | 0.20                 | 0.12                 | 0.30                 |
| Organic Matter BS1377           | N       | 2930 | %     | 0.10  |                      | 5.5                  | 5.0                  | 5.3                  | 4.9                  | 5.3                  | 4.6                  | 5.1                  |

All determinants were seen to be below their respective guideline values and the correct thickness of soils was seen to be present.

The soil chemical test results from the 20<sup>th</sup> of April 2023 are presented in **Annex B**.

Photos of the capping system are presented in **Annex C**.

The exceedance of dibenzo(ah)anthracene on Plot 10 can be considered as an outlier. It was recommended that the soil from the original sampling location on Plot 10 was excavated and removed from site. This was undertaken by Manning Construction, a photograph of the excavation and the waste transfer note can be found in **Annex D**.

Based on the above it is considered that the capping layer placed is suitable for its intended use.

## **5.2 Potable Water Supply Pipes**

Welsh water undertook an assessment and confirmed the need for barrier pipe to be used on the site.

TFW Group Limited have been informed that Welsh Water attended site and confirmed the presence of barrier pipe and that connection to the main supply could be made.

Terra Firma have been provided with correspondence relating to Welsh Water site visits which is included in **Annex E**. Also included in the annex are example photos of water connection showing the barrier pipe in-situ and the Welsh Water quotation for the associated works.

Based on the above it is considered that the barrier pipes placed are suitable for their intended use.

## **5.3 Radon Gas**

Terra Firma have been provided with specification sheets for the materials used in the radon barrier. The membrane is a Frank Mercer Toughsheet Radon Barrier, and this was joined where necessary with Toughsheet Double Sided Mastic Tape. A certificate of factory production control was also provided for the above products.

Terra Firma have also been provided with photos showing the installation of the radon barrier at the site.

Based on the above it is considered that the radon barrier is suitable for its intended use.

The datasheets and photos can be found in **Annex F**.

**ANNEX A  
Chemical Test Certificates  
7<sup>th</sup> March 2023**



# Final Report

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**Report No.:** 23-08019-1

**Initial Date of Issue:** 22-Mar-2023

**Client** Terra Firma (Wales) Ltd

**Client Address:** 5 Deryn Court  
Wharfedale Road  
Pentwyn  
Cardiff  
CF23 7HA

**Contact(s):** Dave Emanuel

**Project** 15710a Glynneath, 15710a

**Quotation No.:** **Date Received:** 09-Mar-2023

**Order No.:** **Date Instructed:** 09-Mar-2023

**No. of Samples:** 2

**Turnaround (Wkdays):** 7 **Results Due:** 17-Mar-2023

**Date Approved:** 22-Mar-2023

**Approved By:**

**Details:** Stuart Henderson, Technical Manager

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## Results - Soil

### **Project: 15710a Glynneath, 15710a**

|                                 |         |      |                      |       |                      |                      |
|---------------------------------|---------|------|----------------------|-------|----------------------|----------------------|
| Client: Terra Firma (Wales) Ltd |         |      | Chemtest Job No.:    |       | 23-08019             | 23-08019             |
| Quotation No.:                  |         |      | Chemtest Sample ID.: |       | 1604411              | 1604412              |
|                                 |         |      | Sample Location:     |       | Plot 2               | Plot 4               |
|                                 |         |      | Sample Type:         |       | SOIL                 | SOIL                 |
|                                 |         |      | Top Depth (m):       |       | 0                    | 0                    |
|                                 |         |      | Bottom Depth (m):    |       | 0.6                  | 0.6                  |
|                                 |         |      | Date Sampled:        |       |                      |                      |
|                                 |         |      | Asbestos Lab:        |       | DURHAM               | DURHAM               |
| Determinand                     | Accred. | SOP  | Units                | LOD   |                      |                      |
| ACM Type                        | U       | 2192 |                      | N/A   | -                    | -                    |
| Asbestos Identification         | U       | 2192 |                      | N/A   | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage             | U       | 2192 |                      | N/A   | -                    | -                    |
| Moisture                        | N       | 2030 | %                    | 0.020 | 18                   | 19                   |
| Soil Colour                     | N       | 2040 |                      | N/A   | Brown                | Brown                |
| Other Material                  | N       | 2040 |                      | N/A   | Roots and Stones     | Roots                |
| Soil Texture                    | N       | 2040 |                      | N/A   | Sand                 | Loam                 |
| pH                              | M       | 2010 |                      | 4.0   | 8.6                  | 8.7                  |
| Boron (Hot Water Soluble)       | M       | 2120 | mg/kg                | 0.40  | 0.79                 | 0.78                 |
| Cyanide (Total)                 | M       | 2300 | mg/kg                | 0.50  | < 0.50               | < 0.50               |
| Sulphate (Acid Soluble)         | U       | 2430 | %                    | 0.010 | 0.034                | 0.065                |
| Arsenic                         | M       | 2455 | mg/kg                | 0.5   | 6.3                  | 7.1                  |
| Cadmium                         | M       | 2455 | mg/kg                | 0.10  | 0.15                 | 0.18                 |
| Chromium                        | M       | 2455 | mg/kg                | 0.5   | 10                   | 11                   |
| Mercury Low Level               | M       | 2450 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Copper                          | M       | 2455 | mg/kg                | 0.50  | 11                   | 12                   |
| Nickel                          | M       | 2455 | mg/kg                | 0.50  | 7.8                  | 8.5                  |
| Lead                            | M       | 2455 | mg/kg                | 0.50  | 18                   | 20                   |
| Selenium                        | M       | 2455 | mg/kg                | 0.25  | 0.30                 | 0.36                 |
| Zinc                            | M       | 2455 | mg/kg                | 0.50  | 38                   | 46                   |
| Chromium (Trivalent)            | N       | 2490 | mg/kg                | 1.0   | 10                   | 11                   |
| Chromium (Hexavalent)           | N       | 2490 | mg/kg                | 0.50  | < 0.50               | < 0.50               |
| Aliphatic VPH >C5-C6            | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7            | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8            | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Aliphatic VPH >C8-C10           | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10     | M       | 2780 | mg/kg                | 0.25  | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12          | M       | 2690 | mg/kg                | 2.00  | 2.5                  | < 2.0                |
| Aliphatic EPH >C12-C16          | M       | 2690 | mg/kg                | 1.00  | 5.4                  | 3.9                  |
| Aliphatic EPH >C16-C21          | M       | 2690 | mg/kg                | 2.00  | 7.3                  | 4.6                  |
| Aliphatic EPH >C21-C35          | M       | 2690 | mg/kg                | 3.00  | 11                   | 7.3                  |
| Aliphatic EPH >C35-C40          | N       | 2690 | mg/kg                | 10.00 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35    | M       | 2690 | mg/kg                | 5.00  | 26                   | 18                   |
| Aromatic VPH >C5-C7             | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8             | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10            | M       | 2780 | mg/kg                | 0.05  | < 0.05               | < 0.05               |



## Results - Soil

### **Project: 15710a Glynneath, 15710a**

|                                 |                      |      |       |       |          |          |
|---------------------------------|----------------------|------|-------|-------|----------|----------|
| Client: Terra Firma (Wales) Ltd | Chemtest Job No.:    |      |       |       | 23-08019 | 23-08019 |
| Quotation No.:                  | Chemtest Sample ID.: |      |       |       | 1604411  | 1604412  |
|                                 | Sample Location:     |      |       |       | Plot 2   | Plot 4   |
|                                 | Sample Type:         |      |       |       | SOIL     | SOIL     |
|                                 | Top Depth (m):       |      |       |       | 0        | 0        |
|                                 | Bottom Depth (m):    |      |       |       | 0.6      | 0.6      |
|                                 | Date Sampled:        |      |       |       |          |          |
|                                 | Asbestos Lab:        |      |       |       | DURHAM   | DURHAM   |
| Determinand                     | Accred.              | SOP  | Units | LOD   |          |          |
| Total Aromatic VPH >C5-C10      | M                    | 2780 | mg/kg | 0.25  | < 0.25   | < 0.25   |
| Aromatic EPH >C10-C12           | M                    | 2690 | mg/kg | 1.00  | 12       | 12       |
| Aromatic EPH >C12-C16           | M                    | 2690 | mg/kg | 1.00  | 19       | 19       |
| Aromatic EPH >C16-C21           | N                    | 2690 | mg/kg | 2.00  | 23       | 23       |
| Aromatic EPH >C21-C35           | M                    | 2690 | mg/kg | 2.00  | 120      | 100      |
| Aromatic EPH >C35-C40           | N                    | 2690 | mg/kg | 1.00  | 15       | 13       |
| Total Aromatic EPH >C10-C35     | M                    | 2690 | mg/kg | 5.00  | 170      | 150      |
| Total VPH >C5-C10               | M                    | 2780 | mg/kg | 0.50  | < 0.50   | < 0.50   |
| Total EPH >C10-C35              | M                    | 2690 | mg/kg | 10.00 | 200      | 170      |
| Naphthalene                     | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Acenaphthylene                  | N                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Acenaphthene                    | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Fluorene                        | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Phenanthrene                    | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Anthracene                      | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Fluoranthene                    | M                    | 2800 | mg/kg | 0.10  | 0.13     | 0.20     |
| Pyrene                          | M                    | 2800 | mg/kg | 0.10  | 0.10     | 0.15     |
| Benzo[a]anthracene              | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Chrysene                        | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Benzo[b]fluoranthene            | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Benzo[k]fluoranthene            | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Benzo[a]pyrene                  | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Indeno(1,2,3-c,d)Pyrene         | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Dibenz(a,h)Anthracene           | N                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Benzo[g,h,i]perylene            | M                    | 2800 | mg/kg | 0.10  | < 0.10   | < 0.10   |
| Total Of 16 PAH's               | N                    | 2800 | mg/kg | 2.0   | < 2.0    | < 2.0    |
| Total Phenols                   | M                    | 2920 | mg/kg | 0.10  | 1.7      | 0.50     |
| Organic Matter BS1377           | N                    | 2930 | %     | 0.10  | 1.5      | 3.6      |

## Test Methods

| SOP  | Title                                                              | Parameters included                                                                                                                                                                                                                                                        | Method summary                                                                                                                                                                         |
|------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2010 | pH Value of Soils                                                  | pH                                                                                                                                                                                                                                                                         | pH Meter                                                                                                                                                                               |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS)         | Moisture content                                                                                                                                                                                                                                                           | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.                                                                                   |
| 2040 | Soil Description(Requirement of MCERTS)                            | Soil description                                                                                                                                                                                                                                                           | As received soil is described based upon BS5930                                                                                                                                        |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium                | Boron; Sulphate; Magnesium; Chromium                                                                                                                                                                                                                                       | Aqueous extraction / ICP-OES                                                                                                                                                           |
| 2192 | Asbestos                                                           | Asbestos                                                                                                                                                                                                                                                                   | Polarised light microscopy / Gravimetry                                                                                                                                                |
| 2300 | Cyanides & Thiocyanate in Soils                                    | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate                                                                                                                                                                                            | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.                                                                                    |
| 2430 | Total Sulphate in soils                                            | Total Sulphate                                                                                                                                                                                                                                                             | Acid digestion followed by determination of sulphate in extract by ICP-OES.                                                                                                            |
| 2450 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                   | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2455 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                   | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2490 | Hexavalent Chromium in Soils                                       | Chromium [VI]                                                                                                                                                                                                                                                              | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2690 | EPH A/A Split                                                      | Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40                                                                                                                                              | Acetone/Heptane extraction / GCxGC FID detection                                                                                                                                       |
| 2780 | VPH A/A Split                                                      | Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10                                                                                                                                                                                                 | Water extraction / Headspace GCxGC FID detection                                                                                                                                       |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS                                                                                                                                                     |
| 2920 | Phenols in Soils by HPLC                                           | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.                                                                                                                          | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.                                                                               |
| 2930 | Organic Matter                                                     | Organic Matter                                                                                                                                                                                                                                                             | Acid Dichromate digestion/Titration                                                                                                                                                    |

## **Report Information**

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### **Key**

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
| U   | UKAS accredited                                                                                               |
| M   | MCERTS and UKAS accredited                                                                                    |
| N   | Unaccredited                                                                                                  |
| S   | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis     |
| SN  | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T   | This analysis has been subcontracted to an unaccredited laboratory                                            |
| I/S | Insufficient Sample                                                                                           |
| U/S | Unsuitable Sample                                                                                             |
| N/E | not evaluated                                                                                                 |
| <   | "less than"                                                                                                   |
| >   | "greater than"                                                                                                |
| SOP | Standard operating procedure                                                                                  |
| LOD | Limit of detection                                                                                            |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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### **Sample Deviation Codes**

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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### **Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



# Final Report

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**Report No.:** 23-07962-1  
**Initial Date of Issue:** 27-Mar-2023  
**Client** Terra Firma (Wales) Ltd

**Client Address:** 5 Deryn Court  
Wharfedale Road  
Pentwyn  
Cardiff  
CF23 7HA

**Contact(s):** Dave Emanuel

**Project** 15710 Glynneath, 15710

**Quotation No.:** **Date Received:** 09-Mar-2023

**Order No.:** **Date Instructed:** 09-Mar-2023

**No. of Samples:** 3

**Turnaround (Wkdays):** 7 **Results Due:** 17-Mar-2023

**Date Approved:** 27-Mar-2023

**Approved By:**

**Details:** Stuart Henderson, Technical  
Manager

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## Results - Soil

**Project: 15710 Glynneath, 15710**

|                                        |                             |            |              |            |                      |                      |                      |
|----------------------------------------|-----------------------------|------------|--------------|------------|----------------------|----------------------|----------------------|
| <b>Client: Terra Firma (Wales) Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-07962             | 23-07962             | 23-07962             |
| <b>Quotation No.:</b>                  | <b>Chemtest Sample ID.:</b> |            |              |            | 1604125              | 1604126              | 1604127              |
|                                        | Sample Location:            |            |              |            | Plot 6               | Plot 8               | Plot 10              |
|                                        | Sample Type:                |            |              |            | SOIL                 | SOIL                 | SOIL                 |
|                                        | Top Depth (m):              |            |              |            | 0                    | 0                    | 0                    |
|                                        | Bottom Depth (m):           |            |              |            | 0.6                  | 0.6                  | 0.6                  |
|                                        | Date Sampled:               |            |              |            | 07-Mar-2023          | 07-Mar-2023          | 07-Mar-2023          |
|                                        | Asbestos Lab:               |            |              |            | DURHAM               | DURHAM               | DURHAM               |
| <b>Determinand</b>                     | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |                      |                      |                      |
| ACM Type                               | U                           | 2192       |              | N/A        | -                    | -                    | -                    |
| Asbestos Identification                | U                           | 2192       |              | N/A        | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage                    | U                           | 2192       |              | N/A        | -                    | -                    | -                    |
| Moisture                               | N                           | 2030       | %            | 0.020      | 19                   | 20                   | 22                   |
| Soil Colour                            | N                           | 2040       |              | N/A        | Brown                | Brown                | Brown                |
| Other Material                         | N                           | 2040       |              | N/A        | Roots                | Roots                | Roots                |
| Soil Texture                           | N                           | 2040       |              | N/A        | Loam                 | Loam                 | Sand                 |
| pH                                     | M                           | 2010       |              | 4.0        | 8.7                  | 8.6                  | 8.6                  |
| Boron (Hot Water Soluble)              | M                           | 2120       | mg/kg        | 0.40       | 2.4                  | 1.2                  | 1.2                  |
| Cyanide (Total)                        | M                           | 2300       | mg/kg        | 0.50       | < 0.50               | < 0.50               | < 0.50               |
| Sulphate (Acid Soluble)                | U                           | 2430       | %            | 0.010      | 0.053                | 0.063                | 0.046                |
| Arsenic                                | M                           | 2455       | mg/kg        | 0.5        | 5.8                  | 5.8                  | 7.5                  |
| Cadmium                                | M                           | 2455       | mg/kg        | 0.10       | 0.14                 | 0.13                 | 0.15                 |
| Chromium                               | M                           | 2455       | mg/kg        | 0.5        | 8.5                  | 9.4                  | 9.1                  |
| Mercury Low Level                      | M                           | 2450       | mg/kg        | 0.05       | 0.05                 | 0.05                 | < 0.05               |
| Copper                                 | M                           | 2455       | mg/kg        | 0.50       | 12                   | 12                   | 9.4                  |
| Nickel                                 | M                           | 2455       | mg/kg        | 0.50       | 7.7                  | 7.5                  | 8.9                  |
| Lead                                   | M                           | 2455       | mg/kg        | 0.50       | 16                   | 21                   | 15                   |
| Selenium                               | M                           | 2455       | mg/kg        | 0.25       | 0.30                 | 0.30                 | 0.36                 |
| Zinc                                   | M                           | 2455       | mg/kg        | 0.50       | 38                   | 43                   | 36                   |
| Chromium (Trivalent)                   | N                           | 2490       | mg/kg        | 1.0        | 8.5                  | 9.4                  | 9.1                  |
| Chromium (Hexavalent)                  | N                           | 2490       | mg/kg        | 0.50       | < 0.50               | < 0.50               | < 0.50               |
| Aliphatic VPH >C5-C6                   | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7                   | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8                   | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C8-C10                  | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10            | M                           | 2780       | mg/kg        | 0.25       | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12                 | M                           | 2690       | mg/kg        | 2.00       | 2.3                  | 2.3                  | 2.3                  |
| Aliphatic EPH >C12-C16                 | M                           | 2690       | mg/kg        | 1.00       | 2.1                  | 2.5                  | 1.7                  |
| Aliphatic EPH >C16-C21                 | M                           | 2690       | mg/kg        | 2.00       | 3.4                  | 3.8                  | 5.2                  |
| Aliphatic EPH >C21-C35                 | M                           | 2690       | mg/kg        | 3.00       | 5.2                  | 6.5                  | 7.4                  |
| Aliphatic EPH >C35-C40                 | N                           | 2690       | mg/kg        | 10.00      | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35           | M                           | 2690       | mg/kg        | 5.00       | 13                   | 15                   | 17                   |
| Aromatic VPH >C5-C7                    | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8                    | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10                   | M                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               |
| Total Aromatic VPH >C5-C10             | M                           | 2780       | mg/kg        | 0.25       | < 0.25               | < 0.25               | < 0.25               |

## Results - Soil

**Project: 15710 Glynneath, 15710**

|                                        |                             |            |              |            |             |             |             |
|----------------------------------------|-----------------------------|------------|--------------|------------|-------------|-------------|-------------|
| <b>Client: Terra Firma (Wales) Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-07962    | 23-07962    | 23-07962    |
| <b>Quotation No.:</b>                  | <b>Chemtest Sample ID.:</b> |            |              |            | 1604125     | 1604126     | 1604127     |
|                                        | Sample Location:            |            |              |            | Plot 6      | Plot 8      | Plot 10     |
|                                        | Sample Type:                |            |              |            | SOIL        | SOIL        | SOIL        |
|                                        | Top Depth (m):              |            |              |            | 0           | 0           | 0           |
|                                        | Bottom Depth (m):           |            |              |            | 0.6         | 0.6         | 0.6         |
|                                        | Date Sampled:               |            |              |            | 07-Mar-2023 | 07-Mar-2023 | 07-Mar-2023 |
|                                        | Asbestos Lab:               |            |              |            | DURHAM      | DURHAM      | DURHAM      |
| <b>Determinand</b>                     | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |             |             |             |
| Aromatic EPH >C10-C12                  | M                           | 2690       | mg/kg        | 1.00       | 6.9         | 3.9         | 7.8         |
| Aromatic EPH >C12-C16                  | M                           | 2690       | mg/kg        | 1.00       | 9.1         | 12          | 5.8         |
| Aromatic EPH >C16-C21                  | N                           | 2690       | mg/kg        | 2.00       | 13          | 13          | 16          |
| Aromatic EPH >C21-C35                  | M                           | 2690       | mg/kg        | 2.00       | 47          | 68          | 75          |
| Aromatic EPH >C35-C40                  | N                           | 2690       | mg/kg        | 1.00       | 9.0         | 10          | 11          |
| Total Aromatic EPH >C10-C35            | M                           | 2690       | mg/kg        | 5.00       | 77          | 97          | 100         |
| Total VPH >C5-C10                      | M                           | 2780       | mg/kg        | 0.50       | < 0.50      | < 0.50      | < 0.50      |
| Total EPH >C10-C35                     | M                           | 2690       | mg/kg        | 10.00      | 90          | 110         | 120         |
| Naphthalene                            | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | < 0.10      | 0.12        |
| Acenaphthylene                         | N                           | 2800       | mg/kg        | 0.10       | < 0.10      | < 0.10      | < 0.10      |
| Acenaphthene                           | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | < 0.10      | < 0.10      |
| Fluorene                               | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.13        | < 0.10      |
| Phenanthrene                           | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.27        | 0.17        |
| Anthracene                             | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.21        | 0.24        |
| Fluoranthene                           | M                           | 2800       | mg/kg        | 0.10       | 0.18        | 0.39        | 0.36        |
| Pyrene                                 | M                           | 2800       | mg/kg        | 0.10       | 0.14        | 0.36        | 0.38        |
| Benzo[a]anthracene                     | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.35        | 0.51        |
| Chrysene                               | M                           | 2800       | mg/kg        | 0.10       | 0.11        | 0.30        | 0.66        |
| Benzo[b]fluoranthene                   | M                           | 2800       | mg/kg        | 0.10       | 0.18        | 0.43        | 0.40        |
| Benzo[k]fluoranthene                   | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.28        | 0.43        |
| Benzo[a]pyrene                         | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.33        | 0.50        |
| Indeno(1,2,3-c,d)Pyrene                | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.31        | 0.48        |
| Dibenz(a,h)Anthracene                  | N                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.28        | 0.56        |
| Benzo[g,h,i]perylene                   | M                           | 2800       | mg/kg        | 0.10       | < 0.10      | 0.34        | 0.41        |
| Total Of 16 PAH's                      | N                           | 2800       | mg/kg        | 2.0        | < 2.0       | 4.0         | 5.2         |
| Total Phenols                          | M                           | 2920       | mg/kg        | 0.10       | 0.17        | 0.14        | < 0.10      |
| Organic Matter BS1377                  | N                           | 2930       | %            | 0.10       | 2.6         | 2.9         | 3.2         |

## Test Methods

| SOP  | Title                                                              | Parameters included                                                                                                                                                                                                                                                        | Method summary                                                                                                                                                                         |
|------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2010 | pH Value of Soils                                                  | pH                                                                                                                                                                                                                                                                         | pH Meter                                                                                                                                                                               |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS)         | Moisture content                                                                                                                                                                                                                                                           | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.                                                                                   |
| 2040 | Soil Description(Requirement of MCERTS)                            | Soil description                                                                                                                                                                                                                                                           | As received soil is described based upon BS5930                                                                                                                                        |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium                | Boron; Sulphate; Magnesium; Chromium                                                                                                                                                                                                                                       | Aqueous extraction / ICP-OES                                                                                                                                                           |
| 2192 | Asbestos                                                           | Asbestos                                                                                                                                                                                                                                                                   | Polarised light microscopy / Gravimetry                                                                                                                                                |
| 2300 | Cyanides & Thiocyanate in Soils                                    | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate                                                                                                                                                                                            | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.                                                                                    |
| 2430 | Total Sulphate in soils                                            | Total Sulphate                                                                                                                                                                                                                                                             | Acid digestion followed by determination of sulphate in extract by ICP-OES.                                                                                                            |
| 2450 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                   | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2455 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                   | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2490 | Hexavalent Chromium in Soils                                       | Chromium [VI]                                                                                                                                                                                                                                                              | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2690 | EPH A/A Split                                                      | Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40                                                                                                                                              | Acetone/Heptane extraction / GCxGC FID detection                                                                                                                                       |
| 2780 | VPH A/A Split                                                      | Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10                                                                                                                                                                                                 | Water extraction / Headspace GCxGC FID detection                                                                                                                                       |
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| 2920 | Phenols in Soils by HPLC                                           | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.                                                                                                                          | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.                                                                               |
| 2930 | Organic Matter                                                     | Organic Matter                                                                                                                                                                                                                                                             | Acid Dichromate digestion/Titration                                                                                                                                                    |

## **Report Information**

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### **Key**

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
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| M   | MCERTS and UKAS accredited                                                                                    |
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| SN  | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T   | This analysis has been subcontracted to an unaccredited laboratory                                            |
| I/S | Insufficient Sample                                                                                           |
| U/S | Unsuitable Sample                                                                                             |
| N/E | not evaluated                                                                                                 |
| <   | "less than"                                                                                                   |
| >   | "greater than"                                                                                                |
| SOP | Standard operating procedure                                                                                  |
| LOD | Limit of detection                                                                                            |

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The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

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Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

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### **Sample Deviation Codes**

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
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- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



**ANNEX B**  
**Chemical Test Certificates**  
**20<sup>th</sup> April 2023**



# Final Report

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**Report No.:** 23-13359-1  
**Initial Date of Issue:** 03-May-2023  
**Client** Terra Firma (Wales) Ltd  
**Client Address:** 5 Deryn Court  
Wharfedale Road  
Pentwyn  
Cardiff  
CF23 7HA

**Contact(s):** Alan Beattie

**Project** 15710 - Glynneath

**Quotation No.:** **Date Received:** 24-Apr-2023

**Order No.:** 15710AB **Date Instructed:** 24-Apr-2023

**No. of Samples:** 8

**Turnaround (Wkdays):** 7 **Results Due:** 03-May-2023

**Date Approved:** 03-May-2023

**Approved By:**

**Details:** Stuart Henderson, Technical  
Manager

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## Results - Soil

**Project: 15710 - Glynneath**

|                                        |                                                                                                               |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------|------------|--------------|------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Client: Terra Firma (Wales) Ltd</b> | <b>Chemtest Job No.:</b> 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359     |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
| <b>Quotation No.:</b>                  | <b>Chemtest Sample ID.:</b> 1628155 1628156 1628157 1628158 1628159 1628160 1628161 1628162                   |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Client Sample ID.: PLOT 1 PLOT 3 PLOT 5 PLOT 7 PLOT 9 PLOT 10 S1 PLOT 10 S2 PLOT 10 S3                        |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Sample Type: SOIL SOIL SOIL SOIL SOIL SOIL SOIL SOIL SOIL                                                     |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Top Depth (m): 0.30 0.30 0.30 0.30 0.30 0.30 0.50 0.20                                                        |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Date Sampled: 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Time Sampled: 12:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00                                                 |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
|                                        | Asbestos Lab: COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY                         |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |
| <b>Determinand</b>                     | <b>Accred.</b>                                                                                                | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |                      |                      |                      |                      |                      |                      |                      |                      |
| ACM Type                               | U                                                                                                             | 2192       |              | N/A        | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    |
| Asbestos Identification                | U                                                                                                             | 2192       |              | N/A        | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage                    | U                                                                                                             | 2192       |              | N/A        | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    |
| Moisture                               | N                                                                                                             | 2030       | %            | 0.020      | 16                   | 18                   | 17                   | 13                   | 16                   | 14                   | 17                   | 16                   |
| Soil Colour                            | N                                                                                                             | 2040       |              | N/A        | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                | Brown                |
| Other Material                         | N                                                                                                             | 2040       |              | N/A        | Stones and Roots     | Stones and Roots     | Stones and Roots     | Stones               | Stones and Roots     | Stones               | Stones               | Stones and Roots     |
| Soil Texture                           | N                                                                                                             | 2040       |              | N/A        | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 | Sand                 |
| pH                                     | M                                                                                                             | 2010       |              | 4.0        | 8.2                  | 8.4                  | 8.3                  | 8.3                  | 8.3                  | 8.2                  | 8.2                  | 8.1                  |
| Boron (Hot Water Soluble)              | M                                                                                                             | 2120       | mg/kg        | 0.40       | 1.2                  | 0.98                 | 0.84                 | 1.0                  | 0.46                 | 0.66                 | 0.89                 | 0.73                 |
| Cyanide (Total)                        | M                                                                                                             | 2300       | mg/kg        | 0.50       | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Sulphate (Acid Soluble)                | U                                                                                                             | 2430       | %            | 0.010      | 0.046                | 0.043                | 0.039                | 0.036                | 0.038                | 0.044                | 0.034                | 0.030                |
| Arsenic                                | M                                                                                                             | 2455       | mg/kg        | 0.5        | 6.2                  | 5.7                  | 5.4                  | 5.2                  | 5.9                  | 5.5                  | 5.6                  | 5.7                  |
| Cadmium                                | M                                                                                                             | 2455       | mg/kg        | 0.10       | 0.16                 | 0.16                 | 0.14                 | 0.14                 | 0.15                 | 0.15                 | 0.14                 | 0.17                 |
| Chromium                               | M                                                                                                             | 2455       | mg/kg        | 0.5        | 11                   | 9.5                  | 9.8                  | 9.5                  | 9.6                  | 9.9                  | 9.4                  | 13                   |
| Mercury Low Level                      | M                                                                                                             | 2450       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Copper                                 | M                                                                                                             | 2455       | mg/kg        | 0.50       | 12                   | 10                   | 10                   | 14                   | 13                   | 11                   | 10                   | 13                   |
| Nickel                                 | M                                                                                                             | 2455       | mg/kg        | 0.50       | 8.3                  | 7.5                  | 7.3                  | 6.9                  | 7.3                  | 7.3                  | 7.2                  | 8.0                  |
| Lead                                   | M                                                                                                             | 2455       | mg/kg        | 0.50       | 21                   | 19                   | 18                   | 15                   | 17                   | 16                   | 16                   | 19                   |
| Selenium                               | M                                                                                                             | 2455       | mg/kg        | 0.25       | 0.33                 | 0.29                 | 0.28                 | 0.26                 | 0.29                 | 0.25                 | 0.30                 | 0.32                 |
| Zinc                                   | M                                                                                                             | 2455       | mg/kg        | 0.50       | 36                   | 34                   | 33                   | 32                   | 36                   | 35                   | 34                   | 36                   |
| Chromium (Trivalent)                   | N                                                                                                             | 2490       | mg/kg        | 1.0        | 11                   | 9.5                  | 9.8                  | 9.5                  | 9.6                  | 9.9                  | 9.4                  | 13                   |
| Chromium (Hexavalent)                  | N                                                                                                             | 2490       | mg/kg        | 0.50       | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               |
| Aliphatic VPH >C5-C6                   | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7                   | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8                   | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C8-C10                  | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | 0.12                 | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10            | M                                                                                                             | 2780       | mg/kg        | 0.25       | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12                 | M                                                                                                             | 2690       | mg/kg        | 2.00       | 2.9                  | 2.8                  | 2.4                  | 2.5                  | 2.9                  | < 2.0                | < 2.0                | 2.2                  |
| Aliphatic EPH >C12-C16                 | M                                                                                                             | 2690       | mg/kg        | 1.00       | 3.2                  | 3.7                  | 2.1                  | 1.8                  | 1.9                  | 2.3                  | 2.0                  | 2.1                  |
| Aliphatic EPH >C16-C21                 | M                                                                                                             | 2690       | mg/kg        | 2.00       | 4.4                  | 3.1                  | 3.5                  | < 2.0                | 7.2                  | 3.0                  | 6.0                  | 4.7                  |
| Aliphatic EPH >C21-C35                 | M                                                                                                             | 2690       | mg/kg        | 3.00       | 10                   | 7.7                  | 8.8                  | 3.8                  | 16                   | 7.0                  | 11                   | 9.1                  |
| Aliphatic EPH >C35-C40                 | N                                                                                                             | 2690       | mg/kg        | 10.00      | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35           | M                                                                                                             | 2690       | mg/kg        | 5.00       | 21                   | 17                   | 17                   | 9.4                  | 28                   | 14                   | 21                   | 18                   |
| Aromatic VPH >C5-C7                    | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8                    | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10                   | M                                                                                                             | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |

## Results - Soil

**Project: 15710 - Glynneath**

| <b>Client: Terra Firma (Wales) Ltd</b> | <b>Chemtest Job No.:</b> 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359 23-13359     |      |       |       |        |        |        |        |        |        |        |        |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------|------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>Quotation No.:</b>                  | <b>Chemtest Sample ID.:</b> 1628155 1628156 1628157 1628158 1628159 1628160 1628161 1628162                   |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Client Sample ID.: PLOT 1 PLOT 3 PLOT 5 PLOT 7 PLOT 9 PLOT 10 S1 PLOT 10 S2 PLOT 10 S3                        |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Sample Type: SOIL SOIL SOIL SOIL SOIL SOIL SOIL SOIL SOIL                                                     |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Top Depth (m): 0.30 0.30 0.30 0.30 0.30 0.30 0.50 0.20                                                        |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Date Sampled: 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 20-Apr-2023 |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Time Sampled: 12:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00                                                 |      |       |       |        |        |        |        |        |        |        |        |
|                                        | Asbestos Lab: COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY COVENTRY                         |      |       |       |        |        |        |        |        |        |        |        |
| Determinand                            | Accred.                                                                                                       | SOP  | Units | LOD   |        |        |        |        |        |        |        |        |
| Total Aromatic VPH >C5-C10             | M                                                                                                             | 2780 | mg/kg | 0.25  | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 |
| Aromatic EPH >C10-C12                  | M                                                                                                             | 2690 | mg/kg | 1.00  | 17     | 16     | 17     | 15     | 16     | 8.4    | 10     | 8.6    |
| Aromatic EPH >C12-C16                  | M                                                                                                             | 2690 | mg/kg | 1.00  | 15     | 19     | 16     | 15     | 17     | 14     | 16     | 18     |
| Aromatic EPH >C16-C21                  | N                                                                                                             | 2690 | mg/kg | 2.00  | 13     | 11     | 13     | 12     | 14     | 17     | 19     | 19     |
| Aromatic EPH >C21-C35                  | M                                                                                                             | 2690 | mg/kg | 2.00  | 67     | 21     | 60     | 7.9    | 110    | 35     | 74     | 64     |
| Aromatic EPH >C35-C40                  | N                                                                                                             | 2690 | mg/kg | 1.00  | 10     | 7.8    | 13     | 5.6    | 14     | 8.7    | 16     | 13     |
| Total Aromatic EPH >C10-C35            | M                                                                                                             | 2690 | mg/kg | 5.00  | 110    | 66     | 110    | 49     | 160    | 74     | 120    | 110    |
| Total VPH >C5-C10                      | M                                                                                                             | 2780 | mg/kg | 0.50  | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Total EPH >C10-C35                     | M                                                                                                             | 2690 | mg/kg | 10.00 | 130    | 84     | 120    | 58     | 190    | 87     | 140    | 130    |
| Naphthalene                            | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene                         | N                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene                           | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene                               | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene                           | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene                             | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene                           | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene                                 | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene                     | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene                               | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene                   | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene                   | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene                         | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene                | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene                  | N                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene                   | M                                                                                                             | 2800 | mg/kg | 0.10  | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's                      | N                                                                                                             | 2800 | mg/kg | 2.0   | < 2.0  | < 2.0  | < 2.0  | < 2.0  | < 2.0  | < 2.0  | < 2.0  | < 2.0  |
| Total Phenols                          | M                                                                                                             | 2920 | mg/kg | 0.10  | 0.15   | < 0.10 | < 0.10 | 0.13   | 0.20   | 0.12   | 0.30   | 0.10   |
| Organic Matter BS1377                  | N                                                                                                             | 2930 | %     | 0.10  | 5.5    | 5.0    | 5.3    | 4.9    | 5.3    | 4.6    | 5.4    | 5.1    |

## Test Methods

| SOP  | Title                                                              | Parameters included                                                                                                                                                                                                                                                       | Method summary                                                                                                                                                                         |
|------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2010 | pH Value of Soils                                                  | pH                                                                                                                                                                                                                                                                        | pH Meter                                                                                                                                                                               |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS)         | Moisture content                                                                                                                                                                                                                                                          | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.                                                                                   |
| 2040 | Soil Description(Requirement of MCERTS)                            | Soil description                                                                                                                                                                                                                                                          | As received soil is described based upon BS5930                                                                                                                                        |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium                | Boron; Sulphate; Magnesium; Chromium                                                                                                                                                                                                                                      | Aqueous extraction / ICP-OES                                                                                                                                                           |
| 2192 | Asbestos                                                           | Asbestos                                                                                                                                                                                                                                                                  | Polarised light microscopy / Gravimetry                                                                                                                                                |
| 2300 | Cyanides & Thiocyanate in Soils                                    | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate                                                                                                                                                                                           | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.                                                                                    |
| 2430 | Total Sulphate in soils                                            | Total Sulphate                                                                                                                                                                                                                                                            | Acid digestion followed by determination of sulphate in extract by ICP-OES.                                                                                                            |
| 2450 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                  | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2455 | Acid Soluble Metals in Soils                                       | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                                  | Acid digestion followed by determination of metals in extract by ICP-MS.                                                                                                               |
| 2490 | Hexavalent Chromium in Soils                                       | Chromium [VI]                                                                                                                                                                                                                                                             | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2690 | EPH A/A Split                                                      | Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40                                                                                                                                             | Acetone/Heptane extraction / GCxGC FID detection                                                                                                                                       |
| 2780 | VPH A/A Split                                                      | Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10 Aromatics: >C5–C7,>C7–C8,>C8–C10                                                                                                                                                                                                | Water extraction / Headspace GCxGC FID detection                                                                                                                                       |
| 2800 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS | Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene* | Dichloromethane extraction / GC-MS                                                                                                                                                     |
| 2920 | Phenols in Soils by HPLC                                           | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.                                                                                                                         | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.                                                                               |
| 2930 | Organic Matter                                                     | Organic Matter                                                                                                                                                                                                                                                            | Acid Dichromate digestion/Titration                                                                                                                                                    |

## **Report Information**

---

### **Key**

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
| U   | UKAS accredited                                                                                               |
| M   | MCERTS and UKAS accredited                                                                                    |
| N   | Unaccredited                                                                                                  |
| S   | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis     |
| SN  | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T   | This analysis has been subcontracted to an unaccredited laboratory                                            |
| I/S | Insufficient Sample                                                                                           |
| U/S | Unsuitable Sample                                                                                             |
| N/E | not evaluated                                                                                                 |
| <   | "less than"                                                                                                   |
| >   | "greater than"                                                                                                |
| SOP | Standard operating procedure                                                                                  |
| LOD | Limit of detection                                                                                            |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

---

### **Sample Deviation Codes**

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

---

### **Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)

**ANNEX C**  
**Capping System Photographs**





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 2 Photos

Date of Photograph:  
7<sup>th</sup> March 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 4 Photos

Date of Photograph:  
7<sup>th</sup> March 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 6 Photos

Date of Photograph:  
7<sup>th</sup> March 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 8 Photos

Date of Photograph:  
7<sup>th</sup> March 2023





Job Number:  
15710

Photograph Description and Orientation:  
Plot 10 Photos

Job Title:  
Parc Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Date of Photograph:  
7<sup>th</sup> March 2023





Job Number:  
15710

Photograph Description and Orientation:  
Plot 1 Photos

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 1 Photos

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:

15710

Photograph Description and Orientation:  
Plot 3 Photos

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:

15710

Photograph Description and Orientation:  
Plot 3 Photos

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:  
15710

Photograph Description and Orientation:  
Plot 5 Photos

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:

15710

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Photograph Description and Orientation:

Plot 5 Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:  
15710

Photograph Description and Orientation:  
Plot 7 Photos

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:

15710

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Photograph Description and Orientation:

Plot 7 Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:

15710

Photograph Description and Orientation:  
Plot 9 Photos

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 9 Photos

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:

15710

Photograph Description and Orientation:  
Plot 10 Photos

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:  
15710

Job Title:  
Park Avenue, Glynneath

Drawing Title:  
Garden Validation Photos

Photograph Description and Orientation:  
Plot 10 Photos (Sample 1)

Date of Photograph:  
20<sup>th</sup> April 2023





Job Number:

15710

Photograph Description and Orientation:

Plot 10 Photos (Sample 2)

Job Title:

Park Avenue, Glynneath

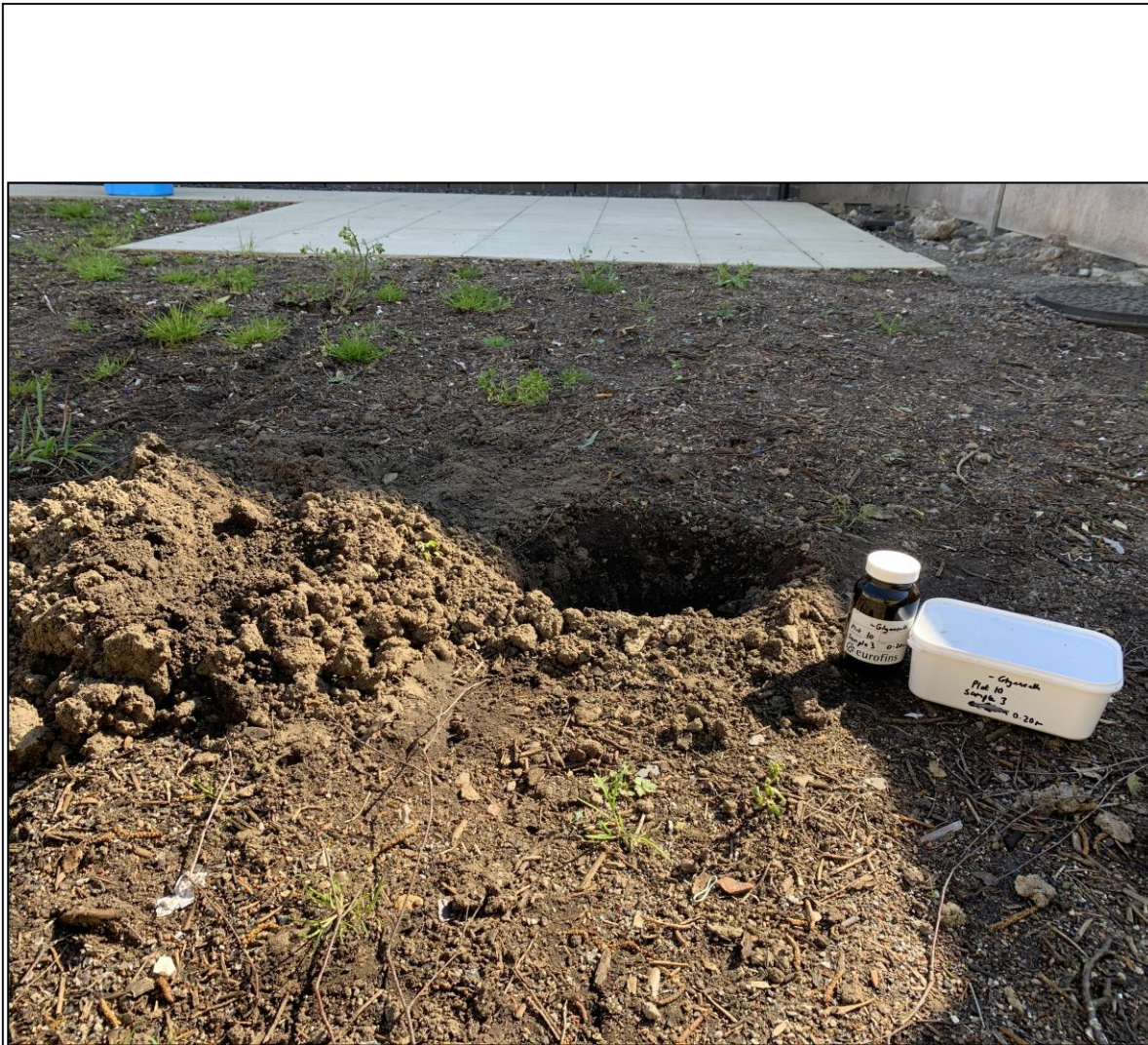
Drawing Title:

Garden Validation Photos

Date of Photograph:

20<sup>th</sup> April 2023





Job Number:

15710

Job Title:

Park Avenue, Glynneath

Drawing Title:

Garden Validation Photos

Photograph Description and Orientation:  
Plot 10 Photos (Sample 3)

Date of Photograph:  
20<sup>th</sup> April 2023



**ANNEX D  
Plot 10 Excavation Photo & Waste  
Transfer Note**



Griffiths Waste Management Ltd  
Beechwood House  
Bryntywod  
Llangyfelach  
Swansea  
SA5 7LP  
01792 795829

**Waste Transfer Note**  
Carrier Licence: CBDU6001  
VAT Reg: 988 1418 75

Account No. GWM-MAN

**COLLECTION**

|                                                                                                |                                                                                                                                 |                                                                                                |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Customers Address<br>MANNING CONSTRUCTION LTD<br>BRODAWEL<br>COYCHURCH<br>BRIDGEND<br>CF35 5BU | Location Address<br>MANNING CONSTRUCTION LTD PLOT 10<br>MAES Y PARC PLOT 10<br>OFF PARK AVE<br>BRIDGEND<br>GLYNNEATH<br>SA115EH | <b>Ticket No.</b> 90910<br><b>Date</b> 23-05-2023<br><b>Order No.</b><br><b>SIC Code</b> 42990 |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|

**Details**

|                                                                                               |                                                                                          |                                                      |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>Product.</b> 4 Cubic Yard<br><b>Waste Type</b> Soil and stones<br><b>EWC Code</b> 17 05 04 | <b>Vehicle Reg</b> CN18UCF<br><b>Time On site:</b> 11:48<br><b>Time Completed:</b> 11:48 | <b>Haulier</b><br><br><b>Driver</b><br>Kevin Kennedy |
| <b>Special Instructions</b> Dispose of soil from plot 10                                      |                                                                                          |                                                      |

**Additional Items Supplied**

**Order No:**

**Terms & Conditions**

STRICTLY only "permitted items as agreed are to be disposed of in any GWM containers. Any non-permitted items will be charged at a minimum of £25 per item. This includes hazardous waste.

STRICTLY no asbestos, no toxic material that constitutes hazardous waste, do not re-site containers, level loads only, no fires or ash, damage will be charged, no liquid or sludge.

By signing this form, you agree and accept full responsibility for any damage to any third party by confirming that I ordered the vehicle off the public highway / and requested against the driver's judgement the skip to be placed in a specific location.

**'I confirm that I have fulfilled my duty to apply the waste hierarchy as required by regulations 12 of the waste (England and Wales) regulations 2011'**

I agree that the waste transferred is as stated above and I confirm that I have fulfilled my duty to apply the waste hierarchy by Regulation 12 of the Waste (England and Wales) Regulations 2011. For and on behalf of the customer:

**Signature:**

**Print Name:**

N9hy

**DISPOSAL INFORMATION**

|                                                                 |                                                                     |
|-----------------------------------------------------------------|---------------------------------------------------------------------|
| <b>DISPOSAL POINT</b> Griffiths Waste Management Waste Incoming | <b>Vehicle Reg</b> CN18UCF                                          |
| <b>Waste Disposal Licence No:</b> EB3397TU                      | <b>Waste Carrier Signature:</b><br><b>Print Name:</b> Kevin Kennedy |
| <b>Date:</b> 23-May-2023                                        |                                                                     |
| <b>Ticket No:</b> 92491                                         |                                                                     |
| <b>Quantity:</b> 240                                            |                                                                     |

**An electronic copy of this Waste Transfer Note is available on request.**





**ANNEX E**  
**Welsh Water Correspondence &**  
**Example Installation Photos**



**Archived:** 24 May 2023 11:57:37 AM  
**From:** [Stephen Euston](#)  
**Sent:** 10 May 2023 4:55:33 PM  
**To:** [Alan Beattie](#)  
**Subject:** FW: Maes - y - Parc, SA11 5EH - Welsh Water  
**Importance:** Normal  
**Sensitivity:** None

---

Alan,

See email trial below , we received nothing for the inspector that came to site just and ok , hence the main was able to be connected and completed

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)



---

**From:** New Connections <New.Connections@dwrcymru.com>  
**Sent:** Tuesday, August 2, 2022 2:51 PM  
**To:** Stephen Euston <SEuston@manning-online.com>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Afternoon Stephen

I've just spoken with our engineer regarding the below and he has confirmed the main was planned to be live last week but was cancelled by Operations twice and has been rescheduled for tomorrow (3<sup>rd</sup> August) at 9am.

Our engineer Andrew Wall spoke with Andrew Banks earlier today and advised him that he would look into it and will get back to him with an update ASAP.

Thank you



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

Extension number: 58008



T: 0800 917 2652



A: PO Box 3146, Cardiff, CF30 0EH



W: [dwrcymru.com](http://dwrcymru.com)



E: [developer.services@dwrcymru.com](mailto:developer.services@dwrcymru.com)



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**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 02 August 2022 08:51  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Good morning hope you are well.

We are due to have connection today ? , a Dwr cymru van pulled into the site this morning , then turn around and drove off

Can you advise what is happening , we really need these connection completed today as agreed/planned otherwise this will have a massive impact on the remaining services.

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)



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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Sent:** 26 July 2022 11:09  
**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water



Brilliant, any problems please let me know.

Thank you



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



W: [dwrcymru.com](http://dwrcymru.com)



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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 25 July 2022 17:14  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Cc:** Andrew Banks <[ABanks@manning-online.com](mailto:ABanks@manning-online.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

There are carrying out the connections on 2<sup>nd</sup> August

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)



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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Sent:** 25 July 2022 17:05  
**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Cc:** Andrew Banks <[ABanks@manning-online.com](mailto:ABanks@manning-online.com)>  
**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

Afternoon Stephen

I can see that the jobs have been passed to our contractors Morrisons who will be in contact with a date and time of inspection.

Plots

1 - 95862612  
2 - 95862613  
3 - 95862614  
4 - 95862615  
5 - 95862616  
6 - 95862617  
7 - 95862618  
8 - 95862619  
9 - 95862620  
10 - 95862661

Thank you



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

**Extension number: 58008**

**T: 0800 917 2652**

**A: PO Box 3146, Cardiff, CF30 0EH**



**W: [dwrcymru.com](http://dwrcymru.com)**

**E: [developer.services@dwrcymru.com](mailto:developer.services@dwrcymru.com)**



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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 25 July 2022 15:28  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Cc:** Andrew Banks <[ABanks@manning-online.com](mailto:ABanks@manning-online.com)>  
**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Hope you are well.

I have tried to call but you were busy.



We had the trench inspected on Friday, all good so we are backfilling as we speak.

Just chasing up the connection no so that we can proceed with the other service , please can you advise when these works are being carried out ,

Best Regards

**Stephen Euston**

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

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Construction



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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 12 July 2022 17:08

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Afternoon

Sorry for the delay I can confirm that our water regulations team have been scheduled to attend and will be in contact with a date and time.

Thank you



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



W: [dwrcymru.com](http://dwrcymru.com)



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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 11 July 2022 16:58  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Hope you are well.

Just wondering if there was any update on this , we want to start to excavate for the property connections

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

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**From:** Stephen Euston  
**Sent:** 06 July 2022 17:43  
**To:** 'New Connections' <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Katy,

The whole main is going live on the 19<sup>th</sup> as advised by Andrew Wall.

All the barrier pipe have been installed to the properties , we just need to excavate to the new pipe.

If you can advise when you can connect we can then ensure we meet your requirements.

These trenches will need inspecting also I assume , we have had your inspector on site

Best Regards



# Stephen Euston

Managing Director

## Manning Construction Limited

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)



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---

**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 05 July 2022 12:36

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Afternoon Stephen.

Please can you confirm what part of the main is going live on the 19<sup>th</sup> and what plots will be ready to connect?

I can then see at getting these arranged.

Thank you



**Katy Davies**

Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



W: [dwrcymru.com](http://dwrcymru.com)



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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Sent:** 05 July 2022 09:02

**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Cc:** Andrew Banks <[ABanks@manning-online.com](mailto:ABanks@manning-online.com)>

**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Hope you are well.

The water main is being installed starting tomorrow, with bit going live on the 19<sup>th</sup>, how do I go about arranging for the connections ?

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)

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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 26 May 2022 09:16

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

Good Morning Stephen

I can confirm that's correct within the cost of the connection the meters are included so once its connected you will have running water.

Have a good day!

Thank you



**Katy Davies**

Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water

Extension number: 58008

T: 0800 917 2652



W: [dwrcymru.com](http://dwrcymru.com)





A: PO Box 3146, Cardiff, CF30 0EH



E: [developer.services@dwrcymru.com](mailto:developer.services@dwrcymru.com)



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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 25 May 2022 15:52  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Hope you are well, within the cost of the connection I assume eth meters are included so once its connected we will have running water , noting else for me to apply for .

Don't usually get involved with this

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

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**From:** Stephen Euston  
**Sent:** 12 April 2022 15:42  
**To:** 'New Connections' <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

Katy

Thank you

Best Regards

**Stephen Euston**

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 12 April 2022 15:39

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Afternoon Stephen

I've raised an inspection for plot 8 for this Thursday 14/04 between 8am – 12pm

Ref: 95862619

Any problems please let me know.

Thank you.



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

Extension number: 58008

T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



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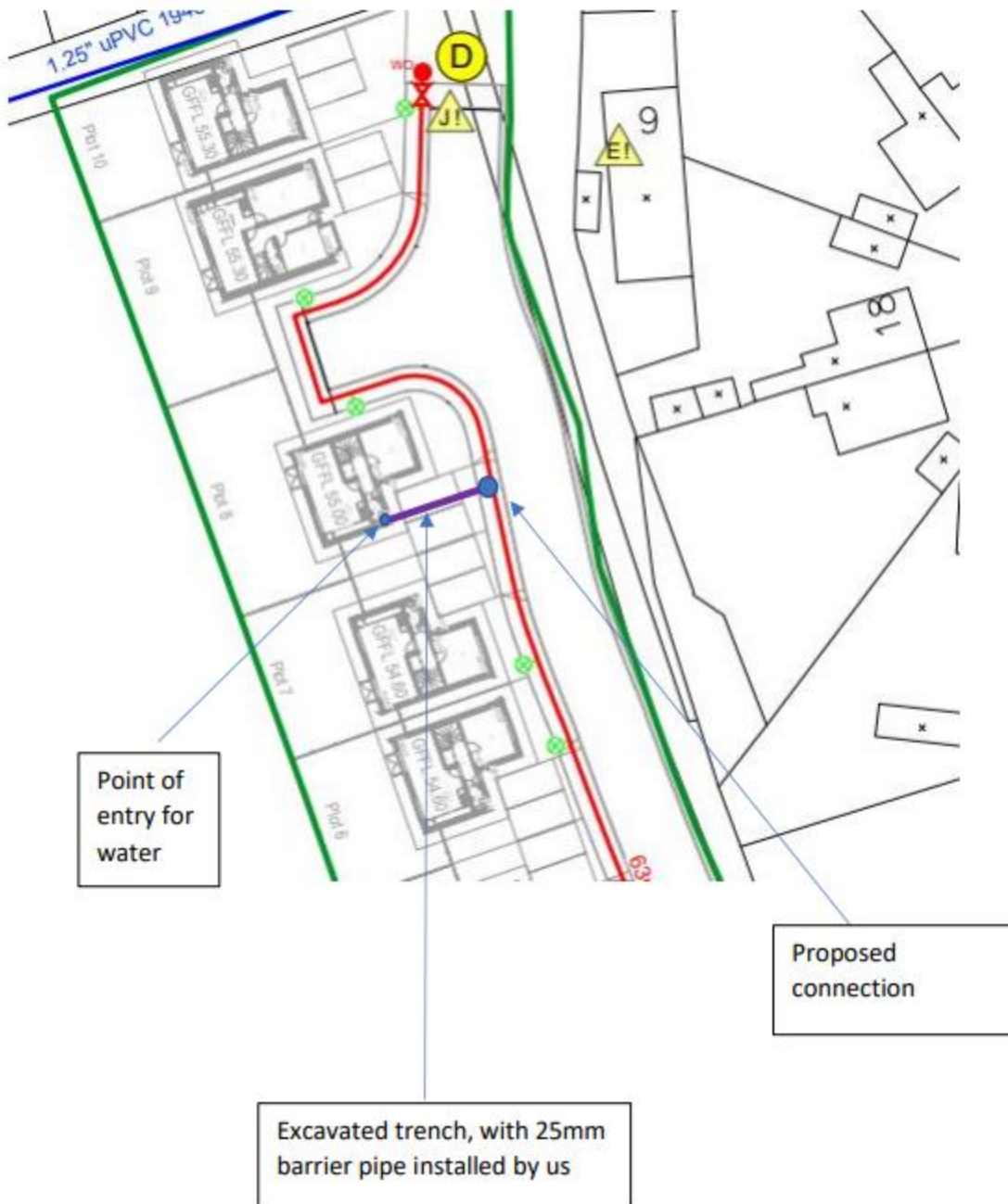
**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>  
**Sent:** 12 April 2022 14:20  
**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>  
**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Hope you are well.

We have excavated the trench for the connection into plot 8, who do we contact to inspect the excavation before we backfill.



Best Regards

# Stephen Euston

Managing Director

## Manning Construction Limited

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

[www.manning-online.com](http://www.manning-online.com)



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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 29 March 2022 12:00

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** RE: Maes - y - Parc, SA11 5EH - Welsh Water

Afternoon Stephen

I can confirm 25mm barrier pipe is needed due to contaminated land one of our water regulations inspectors will be out to inspect the pipework has been laid to a minimum depth of 750mm

The trench is open, or...

The trench isn't open, but I have created inspection holes along the trench and excavated both ends

You've made sure there'll be nothing obstructing our access onto the site such as skips or scaffolding

The pipe can go in any route from the plot to the green marking on the mains design

Thank you



**Katy Davies**

**Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water**

**Extension number: 58008**

**T: 0800 917 2652**

**A: PO Box 3146, Cardiff, CF30 0EH**



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**E: [developer.services@dwrcymru.com](mailto:developer.services@dwrcymru.com)**

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---

**From:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>



**Sent:** 28 March 2022 14:36

**To:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Subject:** RE: Maes - y -Parc, SA11 5EH - Welsh Water

\*\*\*\*\* External Mail \*\*\*\*\*

Katy,

Good afternoon,

Thank you for your time last week, just wanted to confirm our conversation

- 25mm barrier pipe to be used from the property to connection point
- Excavation to be inspected by Welsh water
- Excavation to be 750mm in depth

On the drawing there is no detail of the connection route, I assume it's from the meters , can these be relocate to suit the duct entries.

I will mark up a drawing and send it through

Best Regards

*Stephen Euston*

Managing Director

**Manning Construction Limited**

Tel: 01656 862333

Fax: 01656 861439

Mob: 07773 356084

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**From:** New Connections <[New.Connections@dwrcymru.com](mailto:New.Connections@dwrcymru.com)>

**Sent:** 15 March 2022 12:58

**To:** Stephen Euston <[SEuston@manning-online.com](mailto:SEuston@manning-online.com)>

**Subject:** Maes - y -Parc, SA11 5EH - Welsh Water

Good Afternoon

Please see attached quote and the mains design attached for plots 1-10 at Maes - y -Parc, SA11 5EH.

Any questions please let me know

Thank you



**Katy Davies**  
Developer Services Advisor | Developer Services | Dwr Cymru Welsh Water



Extension number: 58008  
T: 0800 917 2652

A: PO Box 3146, Cardiff, CF30 0EH



W: [dwrcymru.com](http://dwrcymru.com)

E: [developer.services@dwrcymru.com](mailto:developer.services@dwrcymru.com)



If we've gone the extra mile to provide you with excellent service, let us know. You can nominate an individual or team for a Diolch award through our [website](https://contact.dwrcymru.com/en/diolch-awards) - <https://contact.dwrcymru.com/en/diolch-awards>.

Did you know you can now apply for and track applications online via our new Developers portal? Find out more [here](#).

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\*\*\*\*\*

## Quotation

**Quotation No:** 52/6000196204  
**Quotation Date:** 15.03.2022  
**Cust Ord No:**  
**Customer Ref:** 903111732  
**Job No:** NCW2336892

**Location:**  
Plots 1 - 10  
Maes - Y - Parc  
Off Park Avenue, Glynneath  
SA11 5EB

**VAT No:** GB771123159

**Contact:** Developer Services **Tel:** 0800 917 2652

**Page:** 1 of 1

| Description                              | Qty | Unit | Unit Price | Total Value |
|------------------------------------------|-----|------|------------|-------------|
| Connect up to 2m Customer Excavates 25mm | 10  | EA   | 327.00     | 3,270.00    |
| Infrastructure - water                   | 10  | EA   | 400.00     | 4,000.00    |
| Infrastructure - sewerage                | 10  | EA   | 400.00     | 4,000.00    |
| Contaminated land 0 tax                  | 10  | EA   | 62.00      | 620.00      |
| Admin Fee Refund - Credit No Vat         | 1   | EA   | 29.00-     | 29.00-      |

**This Quotation is valid from: 15.03.2022 to 13.09.2022**

| VAT %        | Nett     | VAT  | TOTAL    | VAT TOTAL | TOTAL DUE |
|--------------|----------|------|----------|-----------|-----------|
| Zero-rated   | 3,861.00 | 0.00 | 3,861.00 |           |           |
| Out of scope | 8,000.00 | 0.00 | 8,000.00 |           |           |
|              |          |      |          | 0.00      | 11,861.00 |

### Payment must be received before work can commence

Payment can be made online at [www.dwrcymru.com/developer-services](http://www.dwrcymru.com/developer-services) or by telephone on 0800 9172652. Alternatively you can send your payment to the address below.

We're not-for-profit. Every single penny we make goes back into looking after your water and environment. You can contact us in Welsh or English.

Rydym yn gwmni nid-er-elw. Mae pob ceiniog a wnawn yn mynd i ofalu am eich dŵr a'ch amgylchedd. Cysylltwch a ni yn Gymraeg neu'n Saesneg.

Dŵr Cymru Cyf. (No./Rhif 2366777)

A limited Company registered in Wales:

Cwmni cyfyngedig wedi'i gofrestru yng Nghymru:

Linea, Fortran Road, St Mellons, Cardiff, CF3 0LT

**REMITTANCE ADVICE** - Please detach and return this slip with your payment

**Return Address:**  
Dwr Cymru Welsh Water  
Developer Services  
P.O. Box 3146  
CARDIFF  
CF30 0EH  
GREAT BRITAIN

**Quotation No:** 52/6000196204  
**Quotation Date:** 15.03.2022  
**Customer Ref:** 903111732  
**Job No:** NCW2336892

**Total Due:** 11,861.00

**Cheques to be made payable to:** Dwr Cymru / Welsh Water















**ANNEX F  
Radon Barrier Datasheets & Installation  
Photos**

## Frank Mercer & Sons Ltd

Chequerbent Works  
Manchester Road  
Chequerbent  
Westhoughton  
Bolton  
Lancashire BL5 3JF



Tel: 01942 841111 Fax: 01942 842388

e-mail: sales@toughsheet.co.uk

website: www.toughsheet.co.uk

## Agrément Certificate

99/3603

Product Sheet 2

### FRANK MERCER MEMBRANES

### TOUGHSHEET RADON BARRIER

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Toughsheet Radon Barrier, for use as a low-density polyethylene radon barrier and damp-proof membrane in concrete ground floors, above and below the slab not subject to hydrostatic pressure, to protect the building against moisture and radon from the ground.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



#### KEY FACTORS ASSESSED

**Resistance to water and water vapour** — the membrane provides an effective barrier to the passage of liquid water and water vapour from the ground (see section 6).

**Resistance to underground gases** — the membrane is capable of restricting the ingress of radon gas into the building (see section 7).

**Resistance to puncture** — the membrane has a high resistance to puncture and on a smooth or blinded surface will not be damaged by foot or site traffic (see section 8).

**Durability** — under normal service conditions, the membrane will remain effective against the ingress of water and water vapour, and will restrict the ingress of radon during the lifetime of the flooring construction in which it is installed (see section 12).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 15 June 2017

John Albon – Head of Approvals  
Construction Products

Originally certificated on 7 November 2016

Claire Curtis-Thomas  
Chief Executive

Certificate amended on 18 March 2020 to update membrane thickness and associated text, and NHBC Standards.

*The BBA is a UKAS accredited certification body – Number 113.*

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

*Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

*Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

#### British Board of Agrément

Bucknalls Lane  
Watford  
Herts WD25 9BA

tel: 01923 665300  
[clientservices@bbacerts.co.uk](mailto:clientservices@bbacerts.co.uk)  
[www.bbacerts.co.uk](http://www.bbacerts.co.uk)

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## Regulations

In the opinion of the BBA, Toughsheet Radon Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

|                     |              |                                                                                                                                                                                                                                        |
|---------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Requirement:</b> | <b>C1(2)</b> | <b>Site preparation and resistance to contaminants</b>                                                                                                                                                                                 |
| <b>Comment:</b>     |              | When properly installed in a correctly-designed structure, the product forms an effective barrier to radon gas enabling compliance with this Requirement. See section 7.1 of this Certificate.                                         |
| <b>Requirement:</b> | <b>C2(a)</b> | <b>Resistance to moisture</b>                                                                                                                                                                                                          |
| <b>Comment:</b>     |              | When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground-floor slab, enabling compliance with this Requirement. See section 6 of this Certificate. |
| <b>Regulation:</b>  | <b>7(1)</b>  | <b>Materials and workmanship</b>                                                                                                                                                                                                       |
| <b>Comment:</b>     |              | The product is of an acceptable material. See section 12.1 and the <i>Installation</i> part of this Certificate.                                                                                                                       |



### The Building (Scotland) Regulations 2004 (as amended)

|                    |               |                                                                                                                                                                                                                                                                                                                                               |
|--------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regulation:</b> | <b>8(1)</b>   | <b>Durability, workmanship and fitness of materials</b>                                                                                                                                                                                                                                                                                       |
| <b>Comment:</b>    |               | The product can contribute to a construction satisfying this Regulation. See section 12.1 and the <i>Installation</i> part of this Certificate.                                                                                                                                                                                               |
| <b>Regulation:</b> | <b>9</b>      | <b>Building standards applicable to construction</b>                                                                                                                                                                                                                                                                                          |
| <b>Standard:</b>   | <b>3.1</b>    | Site preparation — harmful and dangerous substances                                                                                                                                                                                                                                                                                           |
| <b>Standard:</b>   | <b>3.2</b>    | Site preparation — protection from radon gas                                                                                                                                                                                                                                                                                                  |
| <b>Comment:</b>    |               | The product will enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.1.2 <sup>(1)(2)</sup> , 3.1.6 <sup>(1)(2)</sup> , 3.1.7 <sup>(1)(2)</sup> , 3.1.8 <sup>(1)(2)</sup> , 3.2.1 <sup>(2)</sup> and 3.2.2 <sup>(1)(2)</sup> . See section 7.1 of this Certificate.                                       |
| <b>Standard:</b>   | <b>3.4</b>    | Moisture from the ground                                                                                                                                                                                                                                                                                                                      |
| <b>Comment:</b>    |               | When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground-floor slab, enabling compliance with this Standard, with reference to clauses 3.4.2 <sup>(1)(2)</sup> , 3.4.4 <sup>(1)(2)</sup> and 3.4.6 <sup>(1)(2)</sup> . See section 6 of this Certificate. |
| <b>Standard:</b>   | <b>7.1(a)</b> | Statement of sustainability                                                                                                                                                                                                                                                                                                                   |
| <b>Comment:</b>    |               | The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.                                                                                                                       |
| <b>Regulation:</b> | <b>12</b>     | <b>Building standards applicable to conversions</b>                                                                                                                                                                                                                                                                                           |
| <b>Comment:</b>    |               | Comments in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .                                                                                                                                                 |

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012 (as amended)

|                    |                    |                                                                                                                                                                                                                                       |
|--------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regulation:</b> | <b>23(a)(i)</b>    | <b>Fitness of materials and workmanship</b>                                                                                                                                                                                           |
| <b>Comment:</b>    | <b>(iii)(b)(i)</b> | The product is acceptable. See section 12.1 and the <i>Installation</i> part of this Certificate.                                                                                                                                     |
| <b>Regulation:</b> | <b>26</b>          | <b>Site preparation and resistance to contaminants</b>                                                                                                                                                                                |
| <b>Comment:</b>    |                    | When properly installed in a correctly-designed structure, the product forms an effective barrier to radon gas enabling compliance with this Requirement. See section 7.1 of this Certificate.                                        |
| <b>Regulation:</b> | <b>28</b>          | <b>Resistance to moisture and weather</b>                                                                                                                                                                                             |
| <b>Comment:</b>    |                    | When properly installed in a correctly-designed structure, the product forms an effective barrier to the movement of water within the ground-floor slab, enabling compliance with this Regulation. See section 6 of this Certificate. |

## Construction (Design and Management) Regulations 2015

## Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

## Additional Information

### NHBC Standards 2020

In the opinion of the BBA, Toughsheet Radon Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 4.1 *Land quality — managing ground conditions* and 5.1 *Substructure and ground bearing floors*.

### CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard EN 13967 : 2012.

## Technical Specification

### 1 Description

1.1 Toughsheet Radon Barrier is a blown film of extruded low-density polyethylene (LDPE).

1.2 The membrane has the following nominal characteristics:

|                                         |          |
|-----------------------------------------|----------|
| Thickness (mm)                          | 0.4, 0.5 |
| Roll length (m)                         | 20, 12.5 |
| Roll width (m)                          | 4        |
| Mass per unit area (g·m <sup>-2</sup> ) | 368, 460 |
| Watertightness                          | pass     |
| Durability (artificial ageing)          | pass     |
| Durability (alkali)                     | pass     |
| Colour                                  | yellow.  |



1.3 Ancillary products for use with the membrane include:

- double-sided butyl tape — for use in joints and laps
- jointing tape — for securing laps and joints.

## 2 Manufacture

2.1 The product is manufactured by an extrusion/coating process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

2.3 The management system of Frank Mercer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by ISOQAR (Certificate 2092QM-001).

## 3 Delivery and site handling

3.1 Rolls of the membrane are packed in wrappers bearing labels with the product name and the BBA logo incorporating the number of this Certificate. Rolls are supplied shrink-wrapped and on pallets.

3.2 The rolls must be stacked on a flat surface, kept under cover and protected from sunlight and mechanical damage.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Toughsheet Radon barrier.

## Design Considerations

## 4 Use

4.1 Toughsheet Radon Barrier is satisfactory for use as a gas-resistant barrier to restrict the ingress of radon into buildings from naturally-occurring sources.

4.2 Buildings in areas of risk should be constructed in accordance with the recommendations of BRE Report BR 211 : 2015 and following the guidance set out in BS 8485 : 2015.

4.3 The product is also satisfactory for use as a damp-proof membrane in accordance with CP 102 : 1973, Section 3, BS 8000-0 : 2014 and BS 8000-4 : 1989.

## 5 Practicability of installation

The membrane is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

## 6 Resistance to water and water vapour



6.1 The membrane, including joints, provides an effective barrier to the passage of liquid moisture from the ground and will enable a floor to comply with the requirements of the national Building Regulations.

6.2 The membranes will comply with the minimum sheet thickness detailed in the documents supporting the national Building Regulations.

## 7 Resistance to underground gases



7.1 The product will restrict the ingress of radon into buildings from naturally-occurring sources.

7.2 Measured gas permeability/diffusion value on an unjointed membrane is given in Table 1.

*Table 1 Gas permeability of Toughsheet Radon Barrier*

| Gas   | Method     | Result                                                |
|-------|------------|-------------------------------------------------------|
| Radon | K124/02/95 | $0.2 \times 10^{-11} \text{ m}^2 \cdot \text{s}^{-1}$ |

7.3 In the opinion of the BBA, the membrane satisfies the criteria for a radon gas-resistant membrane of BRE Report BR 211 : 2015.

## 8 Resistance to puncture

8.1 The membrane can be punctured by sharp objects, and care should be taken when handling building materials over the exposed surface.

8.2 Provided there are no sharp objects present on the membrane's surface prior to and during installation of the protective layer, the product will not be damaged by normal foot traffic.

## 9 Compatibility with other materials

The membrane is compatible with other materials and products typically used in the same areas.

## 10 Underfloor heating

There will be no adverse effect on the membrane from underfloor heating under normal service conditions. In other circumstances the Certificate holder's advice should be sought.

## 11 Maintenance

As the membrane is confined under concrete and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 16).

## 12 Durability



12.1 The membrane will, in normal circumstances, remain effective against the ingress of water and water vapour, and will restrict the ingress of radon during the lifetime of the building.

12.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

## 13 Reuse and recyclability

The product comprises polyethylene, which can be recycled.



### 14 General

14.1 Toughsheet Radon Barrier must be installed and fixed in accordance with the Certificate holder's instructions and the relevant Clauses of BRE Report BR 211 : 2015.

14.2 The membrane can be installed in all normal site conditions, provided that the air temperature is not below 5°C, to prevent the risk of surface condensation.

### 15 Procedure

15.1 The product must only be applied to surfaces that have a smooth finish, ie they should be free from voids, projections and mortar deposits. Surfaces should be dry and free from dust and frost.

15.2 Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.

15.3 The membrane is rolled out, ensuring that it is properly aligned. All end and side overlaps should be a minimum of 150 mm and prepared in accordance with the Certificate holder's instructions.

15.4 When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.

15.5 All surfaces must be dried thoroughly prior to the application of the butyl tape. A strip of the tape is unrolled over the membrane with its nearest edge 50 mm from the membrane edge. The protective paper is removed from the butyl tape prior to rolling an adjacent run of the membrane, which must be carefully unrolled over the jointing tape, ensuring a 100 mm overlap.

15.6 All service penetrations and direction changes should be properly detailed in accordance with the Certificate holder's instructions. Service ducts should be vented to prevent the possibility of gas accumulating in confined spaces.

15.7 The continuity of the gas protection must extend over the footprint of the building and the gas membrane must be sealed to a gas-resistant damp-proof course.

15.8 The membrane should be covered by a screed or other protective layer as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

### 16 Repair

Any damage to the product must be repaired using a patch of the membrane, and laps sealed with double-sided tape and secured with the butyl tape. All patched areas must extend a minimum of 150 mm from the damaged area. If required by the local authority, repair work should be confirmed by an independent validation report, and should be subject to third-party validation, in accordance with BS 8485 : 2015.

### 17 Tests

17.1 Tests were carried out on Toughsheet Radon Barrier and the results assessed to determine:

- dimensions
- density
- water vapour resistance
- water vapour permeability.

17.2 Test were carried out on a product of similar composition and the results assessed to determine:

- dart impact
  - tensile strength and elongation
  - low temperature flexibility
  - nail tear
  - trouser tear
  - dimensional stability
  - heat ageing at 80° for 56 days followed by tensile strength, elongation and nail tear
  - short term UV ageing followed by tensile strengths and elongation
- 
- tensile strength of joints
  - heat ageing of joints at 60° for 28 days followed by tensile strength and elongation.

## 18 Investigations

18.1 An evaluation was made of the results of the test data regarding permeability of radon.

18.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

## Bibliography

BS 8000-0 : 2014 *Workmanship on building sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8485 : 2015 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

EN 13967 : 2012 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and rubber*

BRE Report BR 211 : 2015 *Radon: Guidance on protective measures for new buildings*



### 19 Conditions

#### 19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

19.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

19.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

19.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

### Double Sided Mastic Tape

#### Product Description

- Synthetic rubber based extruded bonding and sealing strip
- Medium to hard composition
- Carefully selected fillers to provide good stability at higher temperatures

#### Applications

- Lap joining of plastic sheeting such as DPCs and DPMs
- Sealing of panels in water storage tanks
- Higher specification roofing applications such as rooflight manufacture
- Sealing of caravan rails such as awning and gutter details

#### Technical Performance

| Description                    | Units             | Value | Test Method |
|--------------------------------|-------------------|-------|-------------|
| Specific Gravity               | g/cm <sup>3</sup> | 1.5   | In House    |
| Shear Adhesion                 | N/cm <sup>2</sup> | 22    | In House    |
| 180° Peel Adhesion (1mm thick) | N/cm              | 24    | In House    |
| Force to compress by 20%       | N/cm <sup>2</sup> | 7     | In House    |

#### Performance Characteristics

|                         |                                  |
|-------------------------|----------------------------------|
| Application Temperature | >4°C                             |
| Service Temperature     | -40°C to +90°C                   |
| UV Resistance           | Good                             |
| Chemical Resistance     | Good to dilute acids and alkalis |

**Surfaces should be clean, dry and free from oil or grease**

#### Features and Benefits

- Easy and accurate to use with little waste and no mess
- Can be supplied in roll form or ready-cut pads
- Approvals include WRC (portable water contact) for black version
- Black or white are standard colours. Others subject to minimum order quantity.

#### Storage Details

- Shelf Life is 2 years at 5 -25°C in dry conditions (in original packaging)



**Accredited**

Reprocessor  
DOE ER199846

**Valpak**

2001 Challenge  
Award Winner  
Recycling



## DECLARATION OF PERFORMANCE CERT- 99/3603.

### TOUGHSHEET RADON /GAS BARRIER – EN13967

Usage, 400/500 micron Flexible Sheeting to be used for water proofing and gas control in solid concrete floors that are not subject to hydrostatic pressure from the ground.

---

**SPECIFICATION-** CFS -2MT/ 4MT X 20MTS X 400MICRON

CFS -2MT/ 4MT X 12.5MTS X 500MICRON

|                           |                 |                  |
|---------------------------|-----------------|------------------|
| <b>THICKNESS -EN12311</b> | 400mu Amber1    | 500mu AMBER 2    |
| <b>LENGTH – EN1848-2</b>  | 20 MTS - 0 + 5% | 12.5 MTS - 0 +5% |
| <b>WIDTH – EN1842-2</b>   | 4MT - 0 + 10%   | 4MT - 0 + 10%    |
| <b>DROP DART-EN12691</b>  | 30 MLV          | 30MLV            |
| <b>WATER TIGHTNESS</b>    | BBA PASS.       |                  |
| <b>STATIC LOADING</b>     | BBA PASS        |                  |
| <b>DURABILITY / AGED</b>  | BBA PASS        |                  |
| <b>MASS BBA TEST.</b>     | 368 MLV         | 460 MLV          |

### GAS TRANSMISSION RATE: 2015

|                             |                                             |          |
|-----------------------------|---------------------------------------------|----------|
| Rapra ASTM-D1434/2009.      | 23 ± 2°C                                    | -Report. |
| Methane transmission        | 321+                                        | 222+     |
| Carbon Dioxide Transmission | 1077+                                       | 771+     |
| Radon- K124/02/95           | 0.2 x 10 <sup>-11</sup> m2 .5 <sup>-1</sup> |          |

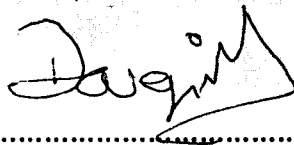
F mercer & sons hold current CE markings and harmonized EN13967 standard.  
NHBC standards 2016 has accepted Toughsheet Radon Barrier when installed  
In accordance with NHBC standards, this product must be laid in accordance  
Of the BRE report – BRE 211:2015. See guidance.

This product must be stored flat and undercover from direct sunlight.

Certificate of factory production control- 0836-CPR-13F030.

Singed for and on behalf of manufacturer.

Signed

A handwritten signature in black ink, appearing to read 'Duggin', is written over a dotted line.

dated

4-8-20













**Terra Firma (Wales) Ltd.** 5 Deryn Court, Wharfedale Road, Pentwyn, Cardiff CF23 7HA  
**Tel:** 029 2073 5354 **Fax:** 029 2073 5433 **Email:** [info@terrafirmawales.co.uk](mailto:info@terrafirmawales.co.uk) [www.terrafirmawales.co.uk](http://www.terrafirmawales.co.uk)