



OUR REF: A3042/19  
YOUR REF:

28<sup>th</sup> November 2021

Mr. Kark Illingworth  
Stockport Developments Ltd

**By Email ([thomasillingworth@ymail.com](mailto:thomasillingworth@ymail.com))**

Dear Thomas,

**Egerton Road North, Whalley Range**

**Background and Terms of Reference**

It is understood that the client intends to construct 6 No. residential properties with associated access via Egerton Road North, car parking, and private garden areas which require contamination testing of the cover system to confirm that clean material has been imported on site, satisfying planning conditions.

This validation report should be read in conjunction with Earth Environmental & Geotechnical Remediation Strategy, dated December 2019.

**Scope of Work**

A site visit was conducted on the 30<sup>th</sup> November 2020 to validate the thickness of the imported material and take samples of the topsoil and sub-base material for laboratory chemical analysis. Hand dug pit logs are presented as Appendix A.

Chemical testing has been performed by DETS a UKAS and MCERTS accredited laboratory. Appendix B provides a copy of the testing results.

The results have been compared to a residential end use (with plant uptake) criteria for the long-term protection of human health and British Standard values for BS3882-2015.

Sample locations for the garden validation are shown in Figure 1 below.

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**Figure 1: Development Layout Plan**



### **Soil Horizons**

The imported material placed in the front and rear garden areas of plots 1 - 6 at Egerton Road North, have been measured and sampled.

The imported material that was sampled and placed in the front garden areas and rear garden areas on site at depths between ground-level to a maximum depth of 600mm, has been described generally as a brown, clayey, slightly gravelly SAND, with gravel of angular red brick, rounded quartz and sandstone and frequent roots. Plastic was also found in HDP05. This material was present in pits HDP04 to HDP09 inclusive.

Another imported material that was sampled and placed in rear garden areas of Plots 1 to 3 at depths between ground-level to a maximum depth of 600mm has been described generally as a soft, brown, very sandy, slightly gravelly CLAY. Gravel included sandstone, carbonaceous fragments, plastic and mudstone. There was also the occasional cobble of concrete flag, as well as rare glass and ceramic fragments. A metal bar was encountered in HDP02 at 0.30m. This material was present in pits HDP01, HDP02, HDP03 and HDP04.

In HDP01 and HDP02, beneath grass turf, a light grey GRAVEL was encountered between 50mm and 150mm. Gravel was predominantly quartz and sandstone but with occasional cobbles of roots, timber board and white mesh.

The depths of the various materials encountered in the exploratory holes are summarised in Table 1, overleaf.

**Table 1: Summary of Cover System Thickness**

| Hand Dug Pit Location | Plot Number  | Cover System Thickness (mm)                                      |
|-----------------------|--------------|------------------------------------------------------------------|
| HDP01                 | Plot 1 Rear  | 50 (Grass Turf)<br>50 (Sub-base, Gravel)<br>450 (Topsoil, Clay)  |
| HDP02                 | Plot 2 Rear  | 50 (Grass Turf)<br>100 (Sub-base, Gravel)<br>450 (Topsoil, Clay) |
| HDP03                 | Plot 3 Rear  | 500 (Topsoil, Sand and Clay)                                     |
| HDP04                 | Plot 4 Rear  | 500 (Topsoil, Sand and Clay)                                     |
| HDP05                 | Plot 4 Front | 50 (Slate chippings)<br>400 (Topsoil, Sand)                      |
| HDP06                 | Plot 6 Rear  | 550 (Topsoil, Sand)                                              |
| HDP07                 | Plot 6 Front | 550 (Topsoil, Sand)                                              |
| HDP08                 | Plot 5 Rear  | 600 (Topsoil, Sand)                                              |
| HDP09                 | Plot 5 Front | 500 (Topsoil, Sand)                                              |

Appendix A provides a copy of the hand dug pit logs.

Rare gravel was observed in the Made Ground material consisting of redbrick, concrete fragments, plastic, ceramic fragments, and glass were observed, however these materials are generally considered inert.

No other notable visual and olfactory evidence of contamination has been observed during the site sampling process.

### **Chemical Testing**

9 samples were obtained from the imported topsoil and sub-base material in front and rear garden areas and 5 of these sent for chemical testing. Results of the testing are presented in Table 2, overleaf.

Chemical testing has been performed for a wide range of analytes including asbestos, pH, TOC, total sulphate, sulphide, total cyanide, As, Cr, Cr (vi), Cu, Pb, Se, Zn, Cd, Hg, Ni, vanadium, barium, beryllium, water soluble boron, mono phenol, and speciated PAH (Report No. 20-14259.1).

Further Asbestos Quantification Testing was conducted on two soil samples (Report No. 20-14608.1).

Appendix B provides a copy of both chemical testing results reports.

At a Tier I stage the long term (chronic) human health toxicity of the soil has been assessed with reference to DEFRA/Environment Agency Contaminated Land Exposure Assessment (CLEA) Soil Guideline Values (SGV) for generic site land uses, soils and exposure.

Where Environment Agency generic guidance is absent, reference has been made to the Chartered Institute of Environmental Health (CIEH) S4ULs for human health risk assessment.

In the case of arsenic, cadmium, hexavalent chromium, lead, benzene, naphthalene, and benzo(a)pyrene DEFRA Category 4 Screening Levels have been adopted.

Table 2 also compares values of chemical testing results with Phytotoxic Contaminants (by Soil pH) stated in the British Standard BS3882:2015 for Multipurpose and Specific Purpose Topsoils.

The values used are based on the pH of the soil and are split into 3 sections of values including <6.0, 6.0-7.0 and >7.0 pH.

As the reported pH values range from 8.1 to 8.5, the >7.0 values should be used.

**Table 2: Assessment of Soil Chemical Data**

| Determinand                             | C4SL/S4UL Levels Residential (mg/kg) | Phytotoxic Contaminants (by Soil pH) from BS3882:2015 (mg/kg) | HDP01 Plot 1 Rear 0.55m        | HDP02 Plot 2 Rear 0.60m       | HDP04 Plot 4 Rear 0.50m | HDP04 Plot 4 Rear 0.50m | HDP04 Plot 4 Rear 0.50m | No of Exceedances |
|-----------------------------------------|--------------------------------------|---------------------------------------------------------------|--------------------------------|-------------------------------|-------------------------|-------------------------|-------------------------|-------------------|
| <b>pH</b>                               |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| pH (alkaline)                           | -                                    | -                                                             | 8.1                            | 8.3                           | 8.2                     | 8.5                     | 8.6                     | -                 |
| <b>Metals</b>                           |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| Arsenic                                 | 37                                   | -                                                             | 8                              | 8                             | 5                       | < 2                     | 2                       | 0                 |
| Boron                                   | 290                                  | -                                                             | < 1                            | < 1                           | < 1                     | < 1                     | < 1                     | 0                 |
| Cadmium                                 | 22                                   | -                                                             | 0.3                            | 0.3                           | 0.3                     | < 0.2                   | < 0.2                   | 0                 |
| Chromium                                | 910                                  | -                                                             | 15                             | 14                            | 9                       | 8                       | 8                       | 0                 |
| Chromium VI                             | 21                                   | -                                                             | < 2                            | < 2                           | < 2                     | < 2                     | < 2                     | 0                 |
| Copper                                  | 2400                                 | 200                                                           | 22                             | 24                            | 18                      | 8                       | 8                       | 0                 |
| Lead                                    | 200                                  | -                                                             | 53                             | 74                            | 48                      | 11                      | 10                      | 0                 |
| Mercury                                 | 1.2                                  | -                                                             | < 1                            | < 1                           | < 1                     | < 1                     | < 1                     | 0                 |
| Nickel                                  | 180                                  | 110                                                           | 12                             | 12                            | 5                       | 6                       | 5                       | 0                 |
| Selenium                                | 250                                  | -                                                             | < 3                            | < 3                           | < 3                     | < 3                     | < 3                     | 0                 |
| Vanadium                                | 410                                  | -                                                             | 18                             | 19                            | 14                      | 9                       | 9                       | 0                 |
| Zinc                                    | 3700                                 | 300                                                           | 70                             | 77                            | 72                      | 30                      | 30                      | 0                 |
| <b>Petroleum Hydrocarbons</b>           |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| Benzene                                 | 0.087                                | -                                                             | < 0.002                        | < 0.002                       | < 0.002                 | < 0.002                 | < 0.002                 | 0                 |
| Toluene                                 | 130                                  | -                                                             | < 0.005                        | < 0.005                       | < 0.005                 | < 0.005                 | < 0.005                 | 0                 |
| Ethylbenzene                            | 47                                   | -                                                             | < 0.002                        | < 0.002                       | < 0.002                 | < 0.002                 | < 0.002                 | 0                 |
| o-xylenes                               | 60                                   | -                                                             | < 0.002                        | < 0.002                       | < 0.002                 | < 0.002                 | < 0.002                 | 0                 |
| m-xylenes                               | 59                                   | -                                                             | < 0.002                        | < 0.002                       | < 0.002                 | < 0.002                 | < 0.002                 | 0                 |
| p-xylenes                               | 56                                   | -                                                             | < 0.002                        | < 0.002                       | < 0.002                 | < 0.002                 | < 0.002                 | 0                 |
| Aliphatic EC >5-6                       | 42                                   | -                                                             | < 0.01                         | < 0.01                        | < 0.01                  | < 0.01                  | < 0.01                  | 0                 |
| Aliphatic EC >6-8                       | 100                                  | -                                                             | < 0.05                         | < 0.05                        | < 0.05                  | < 0.05                  | < 0.05                  | 0                 |
| Aliphatic EC >8-10                      | 27                                   | -                                                             | < 2                            | < 2                           | < 2                     | < 2                     | < 2                     | 0                 |
| Aliphatic EC >10-12                     | 130 (v)                              | -                                                             | < 2                            | < 2                           | < 2                     | < 2                     | < 2                     | 0                 |
| Aliphatic EC >12-16                     | 1100 (s)                             | -                                                             | < 3                            | < 3                           | < 3                     | < 3                     | < 3                     | 0                 |
| Aliphatic EC >16-21                     | 65000 (s)                            | -                                                             | < 3                            | < 3                           | < 3                     | < 3                     | < 3                     | 0                 |
| Aliphatic EC >21-35                     | 65000 (s)                            | -                                                             | < 10                           | < 10                          | < 10                    | < 10                    | < 10                    | 0                 |
| Aromatic EC >5-7                        | 70                                   | -                                                             | < 0.01                         | < 0.01                        | < 0.01                  | < 0.01                  | < 0.01                  | 0                 |
| Aromatic EC >7-8                        | 130                                  | -                                                             | < 0.05                         | < 0.05                        | < 0.05                  | < 0.05                  | < 0.05                  | 0                 |
| Aromatic EC >8-10                       | 34                                   | -                                                             | < 2                            | < 2                           | < 2                     | < 2                     | < 2                     | 0                 |
| Aromatic EC >10-12                      | 74                                   | -                                                             | < 2                            | < 2                           | < 2                     | < 2                     | < 2                     | 0                 |
| Aromatic EC >12-16                      | 140                                  | -                                                             | 2                              | < 2                           | < 2                     | 3                       | 3                       | 0                 |
| Aromatic EC >16-21                      | 260                                  | -                                                             | 12                             | 12                            | < 3                     | 4                       | 5                       | 0                 |
| Aromatic EC >21-35                      | 1100                                 | -                                                             | 18                             | 20                            | < 10                    | 13                      | < 10                    | 0                 |
| <b>Polycyclic Aromatic Hydrocarbons</b> |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| Naphthalene                             | 2.3                                  | -                                                             | 0.14                           | < 0.1                         | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Acenaphthylene                          | 210                                  | -                                                             | < 0.1                          | < 0.1                         | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Acenaphthene                            | 170                                  | -                                                             | 0.13                           | < 0.1                         | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Fluorene                                | 170                                  | -                                                             | 0.14                           | < 0.1                         | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Phenanthrene                            | 95                                   | -                                                             | 1.94                           | 1.33                          | < 0.1                   | < 0.1                   | 0.13                    | 0                 |
| Anthracene                              | 2400                                 | -                                                             | 0.44                           | 0.34                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Fluoranthene                            | 280                                  | -                                                             | 3.33                           | 2.81                          | 0.16                    | 0.17                    | 0.20                    | 0                 |
| Pyrene                                  | 620                                  | -                                                             | 2.58                           | 2.25                          | 0.16                    | 0.15                    | 0.18                    | 0                 |
| Benzo(a)anthracene                      | 7.2                                  | -                                                             | 1.28                           | 1.17                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Chrysene                                | 15                                   | -                                                             | 1.19                           | 1.07                          | 0.11                    | < 0.1                   | 0.12                    | 0                 |
| Benzo(a)pyrene                          | 5                                    | -                                                             | 1.41                           | 1.27                          | 0.15                    | < 0.1                   | < 0.1                   | 0                 |
| Benzo(b)fluoranthene                    | 2.6                                  | -                                                             | 0.37                           | 0.37                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Benzo(k)fluoranthene                    | 77                                   | -                                                             | 0.98                           | 0.91                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Indeno(1,2,3-cd) pyrene                 | 27                                   | -                                                             | 0.49                           | 0.47                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Dibenz (a, h) anthracene                | 0.24                                 | -                                                             | 0.14                           | 0.14                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| Benzo(ghi)perylene                      | 320                                  | -                                                             | 0.44                           | 0.40                          | < 0.1                   | < 0.1                   | < 0.1                   | 0                 |
| <b>Phenols</b>                          |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| Phenol                                  | 280                                  | -                                                             | < 2                            | < 2                           | < 2                     | 2.6                     | 3                       | 0                 |
| <b>Asbestos</b>                         |                                      |                                                               |                                |                               |                         |                         |                         |                   |
| Asbestos Screen                         | -                                    | -                                                             | Detected                       | Detected                      | ND                      | ND                      | ND                      | 2                 |
| Asbestos Type                           | -                                    | -                                                             | Crocidolite present in bundles | Chrysotile present in bundles | -                       | -                       | -                       | 2                 |
| Asbestos Quantification                 | < 0.001                              | -                                                             | 0.002                          | < 0.001                       | -                       | -                       | -                       | 1                 |

All units in mg/kg.

Concentrations in **red** above assessment criteria for residential end use with plant uptake. ND = Not detected.

As shown in the above table, none of the contaminants tested for were found at concentrations in exceedance of screening guideline values relevant to residential end use.

None of the Phytotoxic Contaminants tested for were found at concentrations in exceedance of values used for pH >7.0.

***Asbestos fibres and fragments have however been detected in the soil sample HDP01 Rear 0.55m as bundles of Crocidolite and quantified as 0.002%.***

Asbestos fibres and fragments have also been detected in the soil sample HDP02 Rear 0.60m as bundles of chrysotile but quantified as <0.001%.

**Asbestos** was identified in 2 samples collected from Plot 1 and Plot 2 as Crocidolite and Chrysotile fibre bundles. Subsequent quantification analysis revealed that the Asbestos fibres comprised a maximum of 0.002% w/w of the sampled analysed. In accordance with the CL:AIRE JIWG guidance *Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials* (2016), Asbestos at this level would be classified as 'trace' or 'very low'. The guidance goes on to state that:

*'In such circumstances, therefore, on the basis that the potential risk from exposure to such trivial concentrations of asbestos in the external environment is likely to be very low to negligible, it is practical to conclude that such material, whilst containing very few isolated asbestos fibres, is not strictly an ACM that falls under the definition of asbestos in the Regulations.'*

Since the foregoing, it is considered that the risk to the proposed development from Asbestos may be considered low.

### **Geotextile Membrane**

As well as a clean cover system, it was recommended a geotextile membrane is placed below topsoil material.

The presence of a geotextile membrane was encountered in **all** the hand dug pits excavated across the site.

Figure 2, overleaf presents photographs taken during installation, confirming the geotextile membrane is present.

**Figure 2: Photographs of Installation**

Photograph taken of cover system material stockpiled



Photograph taken during the installation of front garden plot



Photograph taken during the installation of rear garden plot



Proof of purchase of Topsoil



[View Invoice](#)

£1,800.00 due 24 Dec  
268414

Hi,

Here's invoice 268414 for GBP 1,800.00.

The amount outstanding of GBP 1,800.00 is due on 24 Dec 2020.

View your bill online: <https://in.xero.com/yr0UGsYT2SIR1AkUXd1jcuzVcQXblkxuvUXliSG>

From your online bill you can print a PDF, export a CSV, or create a free login and view your outstanding bills.

If you have any questions, please let us know.

Thanks,  
Offerton Sand and Gravel Limited

## **Conclusions & Recommendations**

A cover system has been placed in the front and rear garden areas of plots 1 - 6 and has been validated by Earth Environmental & Geotechnical Ltd.

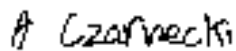
The measured thickness of topsoil in the soft landscaping areas at the front of the houses are 450mm to 550mm and, therefore, meet the requirements of the remediation strategy.

The measured thickness of topsoil in the soft landscaping areas at the rear of the houses are 500mm to 600mm and, therefore meet the requirements of the remediation strategy once the turf is placed.

The presence of a geotextile membrane was identified in all of the hand dug pits.

There were no contaminant exceedances of screening guideline values relevant to a residential end use found.

Yours Sincerely,



**Adam Czarnecki**  
**Director**

**For and on behalf of Earth Environmental & Geotechnical Ltd**

Appendix A    Hand Dug Pit Logs  
Appendix B    Chemical Testing Results  
Appendix C    Soil Assessment Criteria

## **APPENDIX A**

### **HAND DUG PIT LOGS**

**APPENDIX B**

**CHEMICAL TESTING RESULTS**

## **APPENDIX C**

### **SOIL ASSESSMENT CRITERIA**

**Tier I Values for Residential Land Use (with plant uptake)**  
**Based on Sandy Loamy Soil**

|                         |       |       |                                               |
|-------------------------|-------|-------|-----------------------------------------------|
| Arsenic                 | mg/kg | 37    | Category 4 Screening level based on 6% SOM    |
| Boron                   | mg/kg | 290   | CIEH S4UL based on 6% SOM                     |
| Beryllium               | mg/kg | 1.7   | CIEH S4UL based on 6% SOM                     |
| Cadmium                 | mg/kg | 22    | Category 4 Screening level based on 6% SOM    |
| Chromium (III)          | mg/kg | 910   | CIEH S4UL based on 6% SOM                     |
| Chromium (VI)           | mg/kg | 21    | Category 4 Screening level based on 6% SOM    |
| Lead                    | mg/kg | 200   | Category 4 Screening level based on 6% SOM    |
| Mercury (Inorganic)     | mg/kg | 40    | CIEH S4UL based on 6% SOM                     |
| Selenium                | mg/kg | 250   | CIEH S4UL based on 6% SOM                     |
| Nickel                  | mg/kg | 130   | CIEH S4UL based on 6% SOM (Revised, Aug 2015) |
| Copper                  | mg/kg | 2400  | CIEH S4UL based on 6% SOM                     |
| Toluene                 | mg/kg | 130   | CIEH S4UL based on 1% SOM                     |
| Benzene                 | mg/kg | 0.87  | Category 4 Screening level based on 6% SOM    |
| Ethylbenzene            | mg/kg | 47    | CIEH S4UL based on 1% SOM                     |
| P – Xylene              | mg/kg | 56    | CIEH S4UL based on 1% SOM                     |
| Trichlorethene (TCE)    | mg/kg | 0.016 | CIEH S4UL based on 1% SOM                     |
| Tetrachloroethene (PCE) | mg/kg | 0.18  | CIEH S4UL based on 1% SOM                     |
| Zinc                    | mg/kg | 3700  | CIEH S4UL based on 6% SOM                     |
| Cyanide - Free          | mg/kg | 41    | Based on acute risk to 0-6yr old child, HPA   |
| Phenols                 | mg/kg | 280   | CIEH S4UL based on 1% SOM                     |
| PCB                     | mg/kg | 1.4   | CLEA 1.06 modelling with 1% SOM               |
| Naphthalene             | mg/kg | 2.3   | Category 4 Screening level based on 6% SOM    |
| Acenaphthylene          | mg/kg | 170   | CIEH S4UL based on 1% SOM                     |
| Acenaphthene            | mg/kg | 210   | CIEH S4UL based on 1% SOM                     |
| Fluorene                | mg/kg | 170   | CIEH S4UL based on 1% SOM                     |

|                          |       |       |                                             |
|--------------------------|-------|-------|---------------------------------------------|
| Phenanthrene             | mg/kg | 95    | CIEH S4UL based on 1% SOM                   |
| Anthracene               | mg/kg | 2400  | CIEH S4UL based on 1% SOM                   |
| Fluoranthene             | mg/kg | 280   | CIEH S4UL based on 1% SOM                   |
| Pyrene                   | mg/kg | 620   | CIEH S4UL based on 1% SOM                   |
| Benzo(a)anthracene       | mg/kg | 7.2   | CIEH S4UL based on 1% SOM                   |
| Chrysene                 | mg/kg | 15    | CIEH S4UL based on 1% SOM                   |
| Benzo(b)fluoranthene     | mg/kg | 2.6   | CIEH S4UL based on 1% SOM                   |
| Benzo(k)fluoranthene     | mg/kg | 77    | CIEH S4UL based on 1% SOM                   |
| Benzo(a)pyrene           | mg/kg | 5.0   | Category 4 Screening Levels based on 6% SOM |
| Indeno(1,2,3-cd)pyrene   | mg/kg | 27    | CIEH S4UL based on 1% SOM                   |
| Di-benz (a,h) anthracene | mg/kg | 0.24  | CIEH S4UL based on 1% SOM                   |
| Benzo(ghi)perylene       | mg/kg | 320   | CIEH S4UL based on 1% SOM                   |
| Vanadium                 | mg/kg | 410   | CIEH S4UL based on 6% SOM                   |
| TPH Ali C5-C6            | mg/kg | 42    | CIEH S4UL based on 1% SOM                   |
| TPH Ali C6-C8            | mg/kg | 100   | CIEH S4UL based on 1% SOM                   |
| TPH Ali C8-C10           | mg/kg | 27    | CIEH S4UL based on 1% SOM                   |
| TPH Ali C10-C12          | mg/kg | 130   | CIEH S4UL based on 1% SOM                   |
| TPH Ali C12-C16          | mg/kg | 1100  | CIEH S4UL based on 1% SOM                   |
| TPH Ali C16-C35          | mg/kg | 65000 | CIEH S4UL based on 1% SOM                   |
| TPH Ali C35-C44          | mg/kg | 65000 | CIEH S4UL based on 1% SOM                   |
| TPH Aro C5-C7            | mg/kg | 70    | CIEH S4UL based on 1% SOM                   |
| TPH Aro C7-C8            | mg/kg | 130   | CIEH S4UL based on 1% SOM                   |
| TPH Aro C8-C10           | mg/kg | 34    | CIEH S4UL based on 1% SOM                   |
| TPH Aro C10-C12          | mg/kg | 74    | CIEH S4UL based on 1% SOM                   |
| TPH Aro C12-C16          | mg/kg | 140   | CIEH S4UL based on 1% SOM                   |
| TPH Aro C16-C21          | mg/kg | 260   | CIEH S4UL based on 1% SOM                   |
| TPH Aro C21-C35          | mg/kg | 1100  | CIEH S4UL based on 1% SOM                   |
| TPH Aro C35-C44          | mg/kg | 1100  | CIEH S4UL based on 1% SOM                   |