Mr S Sowrey
Persimmon Homes Ltd
3 Hepton Court
York Road
Leeds
LS9 6PW
Date: $6^{\text {th }}$ November 2023
Our ref.: C7747E/AW/10285
Dear Sam,

## Re: C7747E, Lane Side Farm, Morley - Supplement to Remediation Strategy

Please find below our supplementary letter report, updating our previous remediation strategy (RS) (Ref. C7747/RS, dated February 2020) for the development, with updates relating to ground investigation data obtained since issue of the original RS, relating to an updated site development layout, and with reference to a review of historical site information.

### 1.0 Introduction

Sirius Geotechnical Ltd (Sirius) was instructed by Persimmon Homes West Yorkshire Ltd (Persimmon) to review the remedial recommendations for Lane Side Farm, Morley (hereafter referred to as 'the site'). The proposed development layout is shown on Persimmon Drawing Ref. LSF-2020-002 Rev AC, dated $16^{\text {th }}$ March 2023, contained within Appendix A to this report.

Persimmon are in the process of developing the site for a predominantly residential end use, comprising 427 low-rise residential houses with private gardens, 23 apartments in four lowrise blocks, with associated highways and areas of soft landscaping, with a school proposed for future development.

The objectives of this phase of investigation were to:

- Update the remedial recommendations specifically with regards to known areas of made ground identified during the original Geoenvironmental Appraisal (GA) (Report. Ref. C7747/GA, dated 2018) following provision of the development layout which has been updated since the time of writing of the RS report, including a review of ground investigation data obtained since issue of the RS, as described in Section 3.2, below.


### 2.0 Previous Ground Investigation Works / Reports

Previous works undertaken at the site by Sirius, which include the areas of site in question, and the reports arising from these are listed below:

Preliminary Investigation Report (Desk Study) of land at Lane Side Farm, Morley (ref. C5850B), dated March 2016.

Geoenvironmental Appraisal Report for land at Lane Side Farm, Morley (ref. C7747/GA), dated July 2018.

Supplementary Ground Gas Risk Assessment Letter Report (ref. 8591/AMG/C7747), dated $3^{\text {rd }}$ September 2018.

Supplementary Mining Investigation Letter Report for Lane Side Farm, Morley, Leeds (ref. C7747C/MB/9141), dated $22^{\text {nd }}$ November 2019.
Remediation Strategy for land off Lane Side Farm, Morley (Ref. C7747/RS), dated February 2020.
Review of Sirius Ground Investigation Works for land at Lane Side Farm, Morley (Ref C7747/AL/10109), dated 27 ${ }^{\text {th }}$ March 2023.

Supplementary Stockpile Sampling and Soil Testing for land at Lane Side Farm, Morley (Ref C7747E/AW/10285), dated $9^{\text {th }}$ October 2023.
This letter report provides a summary of salient information contained within the above reports, relevant to the objectives of this phase of work. However, it is recommended that the above reports are referred to for further detailed information.

### 3.0 Background

### 3.1 Site Location and Description

The site is located to the southeast of Elland Road in Morley, approximately 5km southwest of Leeds City Centre. A site location plan is presented as Drawing No. C7747F/01, within Appendix A.

It is understood that the site currently comprises an active construction site operated by Persimmon and their groundworks contractor.

### 3.2 Areas of on-site Made Ground

As part of the original 2018 GA (Ref. C7747/GA, dated February 2018), two Coal Authority recorded mine entries, located within the northern part of the site, were investigated via the means of a soil strip. Once located, a series of trial pits were excavated adjacent to the features in order to ascertain the depth to rockhead. Localised made ground was identified within the shallow soils around Shaft 2, comprising ash, slag and clinker, present to a depth of 1.0 m bgl. Subsequent chemical testing on a sample of this material recorded levels of arsenic greater than the relevant human health screening value for a residential land use.

One trial pit (TP28) excavated within the south western area of the site as part of the original 2018 ground investigation (GI) encountered ashy made ground underlying reworked topsoil, to a depth of c 1.0 m bgl. The ashy made ground comprised sandy gravel of ash, and rare concrete, slag and clinker. Chemical testing of this made ground recorded concentrations of benzo(a)pyrene and naphthalene greater than the relevant screening values for a residential land use.

Further delineation of the made ground in the vicinity of TP28 was undertaken as part of a supplementary phase of works, as reported in Sirius letter report ref. C7747E/AW/10285, dated $9^{\text {th }}$ October 2023. The indicative extents of the made ground are illustrated on Drawing No. C7747F/02, included within Appendix A to this report.

Further delineation of the made ground around Shaft 2 was not possible during the abovedescribed phase of supplementary GI works, owing to the presence of a stockpile of site-won topsoil located within the vicinity of the shaft.

### 3.3 Remedial Recommendations

The Sirius RS report noted that the made ground soils in the vicinity of TP28 and Shaft 2 were considered to be chemically and texturally unsuitable to remain at shallow depth within garden / landscaped areas. Therefore, the soils should be placed below areas of hardstanding (but not buildings), or at a depth of at least 1 m beneath areas of clean fill, where it would be satisfactorily isolated from end users, or beneath a clean capping layer.

At the time at which the above-referenced GA and RS reports were issued, the proposed development layout and affected plots were not confirmed. Furthermore, the developer had not expressed a preference on how the areas of made ground were to be treated (i.e. whether the material would be left in-situ and capped, or moved and placed beneath an area of clean fill).

### 4.0 Updated Remedial Recommendations

The supplementary GI works carried out by Sirius in September 2023 allowed further delineation of the made ground soils in the vicinity of TP28. These determined that this material appears to be limited to an area proposed to be developed as Public Open Space (POS), as illustrated on drawing C7747F/02 within Appendix A. Therefore, no proposed development plots are considered likely to be affected by this material, with a clean cover system only required for the area of POS, where the ashy made ground will remain in-situ.

Localised textually and chemically unsuitable made ground soils associated with Shaft 2 were identified on site during the GA as illustrated on drawing C7747F/02 within Appendix A. It is understood that currently a stockpile of site-won topsoil is present above the locality of Shaft 2.

The made ground soils are encountered during the exploration of Shaft 2 are considered likely to be localised to the immediate vicinity of Shaft 2 . As noted above, no further delineation of this material has been possible to date, however it is considered likely that the material would only be present in a small number of surrounding plots (for example Plots 414 to 418 and 427 to 428). Further delineation of this made ground will be required in future, following removal of the existing stockpile of site-won topsoil. At this time, the actual plots affected can not be confirmed, however, a clean cover system will need to be installed where this material is to remain in-situ.

In brief, where the made ground remains in-situ a 600 mm thick clean capping layer will be require within the identified plots (currently estimated to be Plots 414 - 418 and 427), with a 450 mm thick clean capping layer required within the POS area. The thickness and chemical suitability of the capping material placed in these plots / areas will require independent verification.

For all other plots where either made ground is proven to be absent and/or where texturally unsuitable (but chemically suitable) made ground is present, a 300 mm thick suitable growing medium should be placed in garden/landscaped areas. For these areas, assuming that the soils have been shown to be chemically suitable prior to placing, no further verification will be required.

Should the above-described areas of made ground soils extend beyond our understanding, as presented within this report, or should any additional areas of made ground soils be identified during development works, consultation with an appropriately qualified geo-environmental engineer should sought at the earliest stage.

We trust that the above is sufficient for your current requirements and that you will forward to the appropriate regulators for their approval. However, should any further information be required, please do not hesitate to contact the undersigned.

Yours sincerely,

## Andrew Western <br> Senior Engineer

For and on behalf of
Sirius Geotechnical Ltd
Enc.: Appendix A. Drawings

APPENDIX A
DRAWINGS



| NOTES |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Indicative Site Boundary <br> Mine Entry Location（July 2018） |  |  |  |  |
| $\begin{array}{ll} \text { STP1-A } & \text { Trial Pit Location (July } \\ \text { TP202 } & \text { 2018) } \\ & \text { Made Ground Delineation } \\ \text { Trial Pit (September 2023) } \end{array}$ |  |  |  |  |
| Estimated extents of made ground soils which will require future remediation， following further works to delineate their actual extent． |  |  |  |  |
| Indicative extents of made ground soils which will require future remediation． |  |  |  |  |
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| SIRUSGEOTECHNICAL LTD 4245 Park Approach， Thorpe ParkLeeds LS15 8G |  |  |  |  |
| CLIENT <br> Persimmon Homes West Yorkshire |  |  |  |  |
| SITE <br> Laneside Farm， Morley |  |  |  |  |
| dRawing title <br> Indicative Remediation Areas Plan |  |  |  |  |
| DRAWING NO．CT747FO22 |  |  | NNO |  |
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| DATE <br> November 2023 |  |  |  | ${ }_{\text {A1 }}^{\text {aper Stze }}$ |



