



Remediation

Piling Risk Assessment

**Wildhouse Lane
Milnrow
For
Lancet Homes Limited**

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Registered No. 7666053

Quality Management

Issue/revision	issue
Remarks	
Date	18 th November 2022
Prepared by	J Day
Checked by	R Timson
Authorised by	R Timson
Report number	429.11.22.PRA

LIMITATIONS

DB Remediation Ltd (DBR) has prepared this report with reasonable skill, care and diligence and taking account of the contract terms and conditions and manpower and resources devoted to it in agreement with the client. DBR disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

This report has been prepared based on the information received during the timescale available and all potential contamination; constraints or liabilities associated with the site may not necessarily have been revealed.

The report is only valid when it is used in its entirety.

This report is confidential to the client and DBR accepts no responsibility to third parties to whom the report, or any part thereof, is made known. Any such party using any information contained within the report does so at their own risk

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1. Introduction

1.1. Authorisation

DB Remediation (DBR) has been requested to provide a piling risk assessment for the proposed residential development off Wildhouse Lane, Milnrow. This piling risk assessment has been undertaken at the request of the Environment Agency and to satisfy Condition 29 of Planning Application 20/00639/FUL.

Reference has been made to Environment Agency guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination. Guidance on Pollution Prevention. NC/99/73 (2001) in order to complete this assessment.

1.2. Site Description and Setting

The site is located off Wildhouse Lane, Milnrow OL16 3TP at National Grid Reference 392907 413729. The site lies within a predominantly rural location, surrounded by open fields and houses. The site comprises circa 4.8 ha. The site is bound by Wildhouse Lane to the west, an access road to Birchinley Hall Farm to the north, with open fields to the east and south. The site is accessed from the north via Wildhouse Lane.

All above ground buildings have been demolished and the site has been prepared ready for construction.



Figure 1- Site Layout

1.3. Existing Reports and Information Sources

In preparation of this report DBR have reviewed the previous data from the following reports.

- BEK. July 2019. Preliminary Risk Assessment. Report Ref BEK-19555-1.
- BEK. July 2019. Site Investigation and Ground Assessment. Land at Wildhouse Lane, Milnrow. Report Ref BEK 19555-2.
- BEK. October 2019. Controlled Waters Risk Assessment. Ref BEK-19555-191014-BG.
- BEK. October 2019. Ground Gas Risk Assessment. Ref. BEK-19555-191030/BG.
- DBR. May 2020. Ammoniacal Nitrogen Controlled Waters Risk Assessment. Ref DBR-MN-EA001 dated 7th May 2021.
- DBR. September 2021. Remediation Strategy. 394.06.21.RS Revision 1.
- IGE October 2022. Geotechnical Site Investigation Report. Report Reference 3261-01.

This IGE Geotechnical Site Investigation report should be read in conjunction with this report to understand the foundation solution and ground conditions for piling.

1.4. Proposed Development

The proposed development comprises the construction of 47No. houses with associated gardens, driveways and access roads as shown on the Masterplan Drawing included in Appendix A (see Buttress 8764-BA-ZZ-00-DR-A(04)201-V) and below.



Figure 2 – Proposed Site Layout.

2. Piling Risk Assessment

2.1. Introduction

The Environment Agency has expressed concern about a piling or a penetrative ground improvement method at the site. This is due to the potential for creating a preferential pathway through low permeability strata into the underlying aquifer, permitting the potential migration of contamination. The following piling risk assessment will identify the severity of the risk for this site.

2.2. Receptor

The underlying strata comprises Glacial Till classified as a Secondary Undifferentiated aquifer with the Coal Measures (Secondary A) at depth.

There is concern regarding the protection of groundwater as the site is located in a Zone II Source Protection Zone (SPZ) with the Zone I located immediately beyond the site boundary to the NW centred around a former coal shaft. Communication with the EA indicates that the former shaft represents a short circuit for groundwater to enter the aquifer and impact on the potable water abstraction. The shaft is reported to be 71m deep and is understood to still be present. The nearest potable groundwater abstraction is the Butterworth Hall abstraction located 1.2km to the SE owned and operated by United Utilities (UU).

The Secondary A aquifer is therefore considered to be of moderate sensitivity in this location.

2.3. Source

The desk study identified that the site was formerly used as an equestrian facility and then more recently as a sports centre with various indoor and outdoor football pitches. The desk study also indicated that certain parts of the site may have been the infilled with a 'waste' and were mapped as 'landfill'. This was found to represent a low risk of contamination, with subsequent site investigations by BEK confirming the absence of significant sources of contamination. However, concern was raised by the Environment Agency regarding the presence of elevated ammonia in the perched water. This was addressed by DBR via controlled waters risk assessment (Report Ref DBR-MN-EA001 dated 7th May 2021). The elevated ammonia in the perched was likely to be originating from a combination of sources, mostly likely associated with the rural nature of the site and therefore no action was required.

Between April 2022 and July 2022, DBR undertook demolition and localised regarding. During these works there was no evidence of 'waste' within the footprint of the development. The recent investigations by IGE in July 2022 also confirmed no evidence of landfill type waste within these areas.

In conclusion, although the desk study and previous reports identified the potential for landfill/waste, none have been encountered and the ground conditions are considered to be predominantly natural.

2.4. Proposed Foundation Method

Due to the variable depth to bedrock the foundation solution incorporates plots which will have either shallow strip, mass trench, raft or a piled solution. The IGE foundation zoning plan is included in Appendix A which shows the proposed solution.

Towards the centre of the site, a piled foundation solution is necessary to transfer loads through the weak strata and down to the underlying rock strata.

Where piling is proposed this will be precast concrete piles driven and end bearing into the underlying bedrock. A typical pile length is around 3-6m, however where deeper piles are proposed this is due to the presence of deeper Made Ground and/or the presence of soft peat deposits and piles up to 11m. are required. These longer piles will not penetrate any further into the bedrock.

Driven piles are preferred as they have the potential capability to deal with the soft/ unstable shallow ground conditions and penetrate sufficiently into the underlying bedrock, whilst also quickly and effectively sealing the penetration and negating any future permanent pathways for contaminant migration.

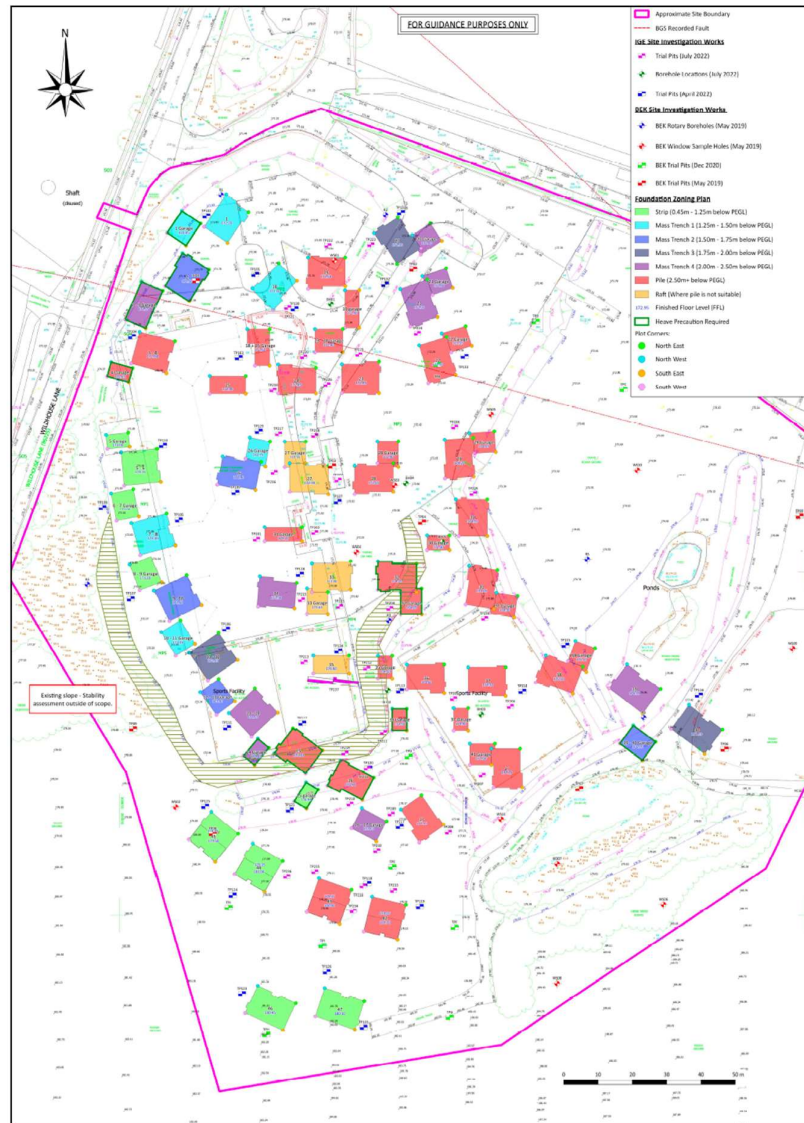


Figure 3 - Proposed Foundation Zoning Plan

2.5. Site Specific Assessment of Pollution Scenarios

The potential pollution scenarios of concern at the site are described in the following table:

Table 1 – Piling Risk Assessment

Pollution Scenario	Comment/Assessment	Resulting Risk Level
Creation of preferential pathways allowing potential contamination of the aquifer	No sources have been identified. Due to the driven method, the piles are in intimate contact with the surrounding soil and therefore will not allow the migration of contaminants around the outside of the pile.	Low
Creation of preferential pathways to allow migration/ground gases/vapours to surface.	Mitigation measures (gas protection measures) to address existing pathways are proposed. Site is classified as Characteristic Situation 2. Gas protection measures include gas resistant membranes and ventilated sub floor void with suspended slab. The piles form a seal with the surrounding ground and therefore there is minimal migration pathway. Upward migration of gases unlikely via either diffusive or advective flow due to density of contaminants.	Low
Direct contact of pile with contaminated soils or leachate causing degradation of materials	Concrete design to take account of identified chemical conditions in the Made Ground – DS-1/AC-1 design requirements for the majority of the site as specified by IGE in Report 3261-01 October 2022, with localised area of DS4-AC4 and DS1-AC2.	Low

2.6. QA/QC Methods or Measures

Appropriate quality control measures to be put in place by the piling contractor to include Health and Safety documentation, protocol for dealing with arisings and pile testing programme to ensure competency of workmanship. Relevant H&S documents should be prepared in advance to ensure safe working practices. Toolbox talks and site briefings will be required.

2.7. Conclusion

Whilst the aquifer is considered to be of moderate sensitivity, no sources of contamination have been identified and therefore the use of a piled foundation method represents a low risk activity. The chosen piling method is a pre-cast driven method which does not penetrate into the bedrock and therefore will not disturb the aquifer. The chosen piling method therefore represents a low risk.

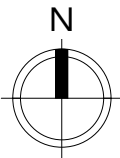
APPENDIX A – DRAWINGS



Note:
Do not scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

10 0 10 20 30 40 50 m

SCALE 1:1250



KEY

Site Boundary

Rev	Date	Intls	Details
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Project Title	Wildhouse Lane Housing
Client	Lancet Homes
Location	Milnrow

Drawing Title	Location Plan
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Date	7/22/2020 10:01:36 AM	Scale	As indicated
Checked	MK	Orig Paper Size	A3

Status

Job No:	Origin:	Zone:	Level:	Type:	Disc:	Number:	Rev:
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8764 -BA-ZZ-00-DR-A- (01)001-



Note:
Do Not Scale from this drawing.
Dimensions are to be checked on site.
If in doubt please ask.

N

5 0 5 10 15 20 25 m

SCALE 1:500

- Key
- HT01 - 5 Bed 191.1m² - 12 units
- HT02 - 4 Bed 159.6m² - 5 units
- HT03 - 4 Bed 143.8m² - 7 units
- HT04 - 4 Bed 159.6m² - 1 units
- HT05 - 2 Bed Bungalow 88.9m² - 4 units
- HT06 - 3 Bed Bungalow 111.3m² - 4 units
- HT07 - 3 Bed Semi - 111.6m² - 12 units
- HT08 - 3 Bed Detached 84.4m² - 2 units

Total Units: 47

For landscape refer to TEP drawings

V	04/11/20	CNS	Planning Submission
U	05/08/20	CNS	Updated to layout
T	16/07/20	CNS	Updated to layout
S	13/07/20	CNS	Updated to layout
R	13/07/20	CNS	Updated to layout
Q	16/06/20	CNS	Updated to layout
P	16/06/20	CNS	Updated to layout
N	06/02/20	CNS	Updated to layout
M	29/05/20	CNS	Updated to layout
L	27/04/20	CNS	Updated to layout
K	05/04/20	CNS	Updated to layout
J	25/03/20	CNS	Updated to layout
H	23/03/20	CNS	Updated to layout
G	13/03/20	CNS	Updated to layout
F	27/01/20	CNS	Updated to layout
E	04/12/20	CNS	Updated to layout
D	31/10/19	CNS	Updated to layout
C	23/10/19	CNS	Updated to layout
B	04/10/19	CNS	Updated to layout
A	26/02/19	CNS	Updated to layout
-	12/08/19	CNS	Site Layout
Rev	Date	Intis	Details

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Project Title	Wildhouse Lane
Client	Lancet Homes
Location	Milnrow
Drawing ref	Site Plan

Date	11/4/2020 6:06:38 PM	Scale	As indicated
Checker	MK	Orig Paper Size	A1

Job No:	8764	Status	Planning
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Project: Origin: Zone: Level: Type: Disc: Number: Rev:

8764-BA-ZZ-00-DR-A- (04) 210- V