



**Castledine
Environmental**

LAND CONTAMINATION SURVEYS

**Phase 3 Remediation Strategy
and Verification Plan
for
Proposed Demolition of Existing
Dwelling and Outbuildings and
Erection of a Replacement
Dwelling and Detached Garage
on the site of
Little Moat, Newbold Road,
Kirkby Mallory, Leicester
LE9 7QG**

Date: November 2023

Status:

Final Report

Reference:

3628D P3 Hall – Kirkby Mallory

Date:

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Tel: 01509 880399 Email: info@castledineenvironmental.co.uk

4 Wymeswold Road, Hoton, Loughborough, Leicestershire, LE12 5SN

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1.0 QUALITY ASSURANCE

Castledine Environmental confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine Environmental would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine Environmental.

Kevin Castledine

(Proprietor)

2.0 LIMITATIONS

The conclusions and recommendations made in this report are limited to those based on the findings of the investigation. Where comments are made based on information obtained from third parties, Castledine Environmental assumes that all third-party information is true and correct. No independent action has been undertaken to validate the findings of third parties. The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at the time.

This survey has not included asbestos within existing structures, invasive plant species, geotechnical considerations or any elements unconnected with potential ground contamination at the site. If required, such surveys should be undertaken by suitably accredited organisations.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

3.0 INTRODUCTION

Castledine Environmental have been appointed by Mr. T. J. Hall to undertake a Phase 3 remediation Strategy and Verification Plan on a site at Little Moat (No.12 Newbold Road), Newbold Road, Kirkby Mallory, Leicestershire LE9 7QG.

The following reports previous reports on the site are:

- Phase 1 Land Contamination Risk Assessment for site at Newbold Road, Kirkby Mallory, Leicestershire. Produced by Castledine Environmental in August of 2022 and referenced: 3338D
- Phase 2 Land Contamination Risk Assessment for site at Newbold Road, Kirkby Mallory, Leicestershire. Produced by Castledine Environmental in October of 2023 and referenced: 3424D

4.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of Mr. T. J. Hall and his appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework 2021
- part C1 of the building regulations.
- Condition No.5 of the Hinckley and Bosworth planning approval reference 18/00914/FUL

5. No development shall commence on the foundations of the dwelling hereby approved until a scheme for the investigation of any potential land contamination on the site has first been submitted to and agreed in writing by the local planning authority which shall include details of how any contamination shall be dealt with and a period of implementation. The approved scheme shall be implemented in accordance with the agreed details and any remediation works so approved shall be carried out in accordance with the agreed implementation period prior to any works commencing on the foundations.

Reason: To ensure that risks from land contamination to future users of the site are minimised thus ensuring that the land is fit for purpose and to accord with Policy DM7 of the SADMP.

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine Environmental.

The report consists of a Remediation Strategy and Verification Plan in accordance with

- LCRM “Land Contamination Risk Management”.
- BS10175:2011+A2:2017, Investigation of potentially contaminated sites. Code of practice
- CLR11 “Model Procedures for the Management of Land Contamination”.

The objectives of the report are:-

- Report the existing information relating to the soil contamination and the ground gas regime within the area of the site.
- Set out the remediation measures and validation processes to be followed on site to ensure the site development does not pose a risk to human health.

5.0 SITE DESCRIPTION

The site is located in Kirkby Mallory, Leicestershire at National Grid Reference: 445349,301639 and is approximately 0.51ha in area.

The site is rectangular in shape and is orientated north east to south west and connected to Newbold Road to the west via a connecting access spur. The site is located in a predominantly rural area and is directly bounded by a small, fielded area with an associated dwelling and grounds beyond to the north, field beyond a hedgerow to the east, further field south and west with Newbold Road to the west and a small lake beyond this.

The site interior comprises an open plot of largely unoccupied land, save for a single, centrally located former stables. A tarmac and gravel access track leads east off Newbold Road to the main site area, terminating an expanse of gravels. Also noted here was a large heap of timber and cut vegetation. Stables were seen to be located centrally on site and orientated slightly north east to south west and constructed of timber with tiled roofing and concrete flooring. The stables possessed a central unit which appeared to be a former refrigeration unit, with traditional stabling to either side of this. To the north east of the stables lies a concrete base, likely associated with equestrian purposes; and east of the main site area a large, vegetated mound was noted. The remainder of site is occupied by grassed and gravelled areas, with a sandy area located in the north west of site and extending west offsite, which resembled a former ménage. The remaining ground conditions comprised mixed natural and anthropogenic gravels in low lying vegetation.

The evident areas of demolition on site and areas of road chippings as gravel-access routes or parking are considered potential sources of contamination. Topographically, the site is level.

Photographs of the site can be found as Appendix D of the previous report for the site.

6.0 OVERVIEW OF FINDINGS AND RECOMMENDATIONS FROM PREVIOUS REPORTS

The following previous reports have been referred to and should be read in conjunction with this report:

- Phase 1 Land Contamination Risk Assessment for site at Newbold Road, Kirkby Mallory, Leicestershire. Produced by Castledine Environmental in August of 2022 and referenced: 3338D
- Phase 2 Land Contamination Risk Assessment for site at Newbold Road, Kirkby Mallory, Leicestershire. Produced by Castledine Environmental in October of 2023 and referenced: 3424D

The most pertinent information is summarised in the following sections.

6.1 SUMMARY OF SOIL CONTAMINATION

The initial Phase 1 Report for the site found that, historically, the site remained unoccupied from circa.1885 through until circa.1958 when a dwelling was located in the north western extent of site. Following this, the site is developed with outbuildings and a barn by circa.1959 to 2003, after which the site buildings were demolished, leaving only the stables. The various developments and demolitions of buildings on site, along with the noted ground conditions and onsite and nearby heaps are considered potential sources of soil contamination. Accordingly, a Phase 2 Intrusive Site Investigation was planned and carried out, combining soil sampling with ground gas monitoring (which classified the site as Characteristic Situation 1 (CS1) and as such, no ground gas protection measures were considered necessary). The initial round of sampling identified an exceedance of the Lead GAC of 200mg/kg by a reading of 263mg/kg at the location of WS04 (ménage area) at 0.10m depth. As such, further delineation sampling was carried out on the ménage area, the results of which identified further exceedances of lead within the surface-level ménage material and further, significant exceedances of PAH's within the underlying ash subbase to the ménage. As such, it was recommended that this area be remediated.

7.0 REMEDIATION OF THE MÉNAGE AREA

Due to the identified exceedances of lead within the surface-level ménage material and the significant exceedances of PAH's in the underlying ash subbase, it is recommended that the entirety of the ménage area be remediated. It should be noted that the ménage area itself extends outside the redline plan of the site, however, this additional area appears to remain within client-owned land. As such, the remedial actions should also be extended to cover both this area, and approximately 1m outside the boundary of the ménage itself.

As such, the area should be excavated sufficiently to remove all surface-level ménage material, along with the ash subbase itself. The excavation should be of sufficient depth to allow the emplacement of a minimum of

600mm of certified clean, imported material. The imported material should be laid atop a high-visibility woven geotextile membrane, to provide separation between residual site soils and fresh, imported material along with acting a warning and 'no-dig barrier' to future end-users of the site.

If arisings from the foundation trenches are to be utilised then they must be tested. It is suggested that the arisings be placed in one heap, this may be in the menage area, to be tested before being spread. Testing will be at the frequency stated for soil from a single source.

Guidance found in Section A.3 of BS3882:2015: '*Specification for Topsoil*' states that the minimum rooting depth for grass, shrubs and trees should be at least 450mm, 600mm or 900mm, respectively; however, it is recommended that a *minimum* of 600mm imported capping is achieved. Prior to the spreading of the imported material, the receiving area should be decompacted to increase the underlying permeability, to further plant growth and sustainability.

Prior to the placement of imported material it should be tested. Material can be sourced from other developments and commercial companies. Dependent on the source of the material it can be classified as either from a 'Greenfield/Manufactured' or 'Brownfield/Screened' source.

Broadly speaking material can be classified as follows:

- Greenfield - if it can be demonstrated that it has not been developed and that no past contaminative uses have occurred at the site.
- Manufactured – from a commercial company who manufacture material by mixing or blending mineral soils (subsoil or sand) with an organic amendment (compost).
- Brownfield – material from a donor site that has previously been developed
- Screened – material from a company who deal with skip/demolition waste which is screened for unsuitable material i.e. bricks, wood, plastic etc.

Brownfield and screened material are more likely to be of a lesser quality and will require more robust testing to prove their suitability therefore Greenfield or Manufactured material will be used. Imported soil must not contain materials such as plastics, metals, asbestos, glass, tarmac, demolition rubble etc.

Any supplied testing results from a commercial company must be from the actual material to be imported and be no more than two months old. This should be provided to the relevant Local Authority prior to importation.

If certificates are not supplied then testing should be done before being brought to site, the testing should be carried out by a UKAS accredited laboratory and there should be either:

- one sample per 250 m³ with a minimum of three tests

For soil from a single source, a minimum of:

- 1 No. samples for every 150m³ (for smaller quantities, a minimum of 3 No. tests will be required)

Each test must include as a minimum:

- Standard metals/metalloids (should include as a minimum As,Cd,Cr,CrVI,Cu,Hg,Ni,Pb,Se,Zn)
- PAH (16 USEPA speciation)
- Asbestos
- Total TPH
- pH
- Pesticide suite (from agricultural sources)

Environmental samples of imported materials will be tested in line with current CLEA Soil Guideline Values and relevant Generic Acceptance Criteria (GAC) and SGV's.

Imported material should preferably not be stockpiled on site but placed in the intended area straight away so as to not cause cross contamination.

Test results for the intended imported material must be submitted to the local authority and approved before being brought onto site.

All transfer notes and/or receipts for the soil should be retained.

The thickness of the soil placed will require evidence either via photographs during its placement or by digging of post placement verification trial holes.

8.0 VERIFICATION PLAN

8.1 CAPPING MATERIAL

8.1.1 VERIFICATION OF CORRECT DEPTH OF COVER LAYER

There are two main ways to confirm the depth of cap.

- **TOPOGRAPHICAL SURVEYS**

This method requires an accurate survey of the base, following removal of any material as required, and final formation layer height to establish the depth of cover.

- **DEPTH TESTING IN SITU**

Small trial pit excavated to allow measurement of its depth by tape measure or measuring staff. This would normally be one pit per garden area. Photograph each test pit showing depth of cap.

8.1.2 PHOTOGRAPHIC EVIDENCE FOR VALIDATING THE DEPTH OF COVER

The following is guidance on photographs as additional evidence to support either of the above methods.

- Proof that the depth of inert cover has been installed
- Proof there is a geotextile separator and visual warning membranes (if used) between the made ground and suitable for use soils.
- Proof of the method of placement and different layers if appropriate
- Proof of the completed project
- Inclusion of geographic background features which will aid locating the photograph

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9.0 WATCHING BRIEF

It remains possible that previously unexpected soil conditions may be encountered during the construction process. Examples may include oily pockets within the soil, potential for asbestos containing materials, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former demolition materials.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

1. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Client or their appointed agent who will in turn contact Castledine Environmental to request an engineer to visit the site to assess the extent of the 'contamination'.
2. Castledine Environmental shall make records of their inspection, and pass details of these to the Local Authority.
3. Where the conditions revealed differ from those previously anticipated, Castledine Environmental shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.
4. Depending on the results of the testing either:
 - a. no further work will be required;
 - b. a further detailed risk assessment will be required; and/or
 - c. Localised specific remedial measures will be necessary.
Appraisal criteria will vary depending on the nature of the assessment.
5. The results of any such testing will be sent to the Local Authority Pollution Control Section, Local Authority development control section, and the appointed building inspector. If remediation is required, the LA/Building inspector will be informed of the date and time of the proposed works.
6. Remediation will be undertaken in accordance with a method statement submitted for approval. The works shall be supervised

where necessary by Castledine Environmental who shall provide a Verification Report for the Local Authorities.

7. A copy of the discovery strategy (Appendix C) should be lodged on site and provisions made to ensure that all workers are made aware of their responsibility to observe, report and act on any potentially suspicious or contaminated materials they may encounter.

10.0 REPORTING

10.1 CAPPING MATERIAL

When the Capping layer has been completed and verified, a report should be produced for submission to the Local Authority. This should confirm that the works have been done and confirm that the site is now suitable for its intended use.

The report should contain

- A summary of the remediation strategy and work undertaken.
- Copies of waste transfer note(s) and / or invoice(s) showing how much material has left site and its destination.
- A copy of the laboratory analysis results for imported material
- Copies of the transfer note(s) and / or invoice(s) for imported material showing the amount imported.
- Good quality photographs as indicated in section 8.1.2

11.0 REFERENCES**11.1 LEGISLATION AND REGULATIONS****11.1.1 ACTS**

- [1] Environmental Protection Act 1990, Part IIA: inserted by Environment Act 1995, Section 57. See Environment Act 1995 for text of Part IIA.

11.1.2 PLANNING REGULATIONS

- [2] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI1999/No.293
- [3] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 SI2000/No.2867

11.1.3 CONTAMINATED LAND REGULATIONS

- [4] The Contaminated Land (England) Regulations 2000. SI2000/No.227
- [5] The Contaminated Land (England) (Amendment) Regulations 2001 SI2001/No.663
- [6] The Contaminated Land (England) Regulations 2006 SI2006/No.1380

11.2 STATUTORY GUIDANCE

- [7] Department of Environment, Food and Rural Affairs. 2012. *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance*. Department of Environment, Food and Rural Affairs
- [8] Communities and local Government, 2012: National Planning Policy Framework.

11.3 BRITISH STANDARDS

- [9] BS 5930:2015 Code of practice for site investigations
- [10] BS 10175:2011+A2:2017 Investigation of potentially contaminated sites - Code of practice
- [11] BS 8485:2015 +A1:2019 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- [12] BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

11.4 NON STATUTORY TECHNICAL GUIDANCE**11.4.1 ENVIRONMENT AGENCY**

- [13] Cassella Stranger, 2002. Model Procedures for the Management of Contaminated Land, Contaminated Land Report (CLR) 11, Department for Environment, Food, and Rural Affairs.

11.4.2 CIRIA PUBLICATIONS

- [14] Wilson, S., Oliver, S., Mallett, H., Hutchings, H., and Card, G.. 2007, *C 665 Assessing risks posed by hazardous ground gases to buildings* London: Construction Industry Research and Information Association
- [15] Mallett, H., Cox, L., Wilson, S. and ,Corban M... 2014, *C 735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases* London: Construction Industry Research and Information Association

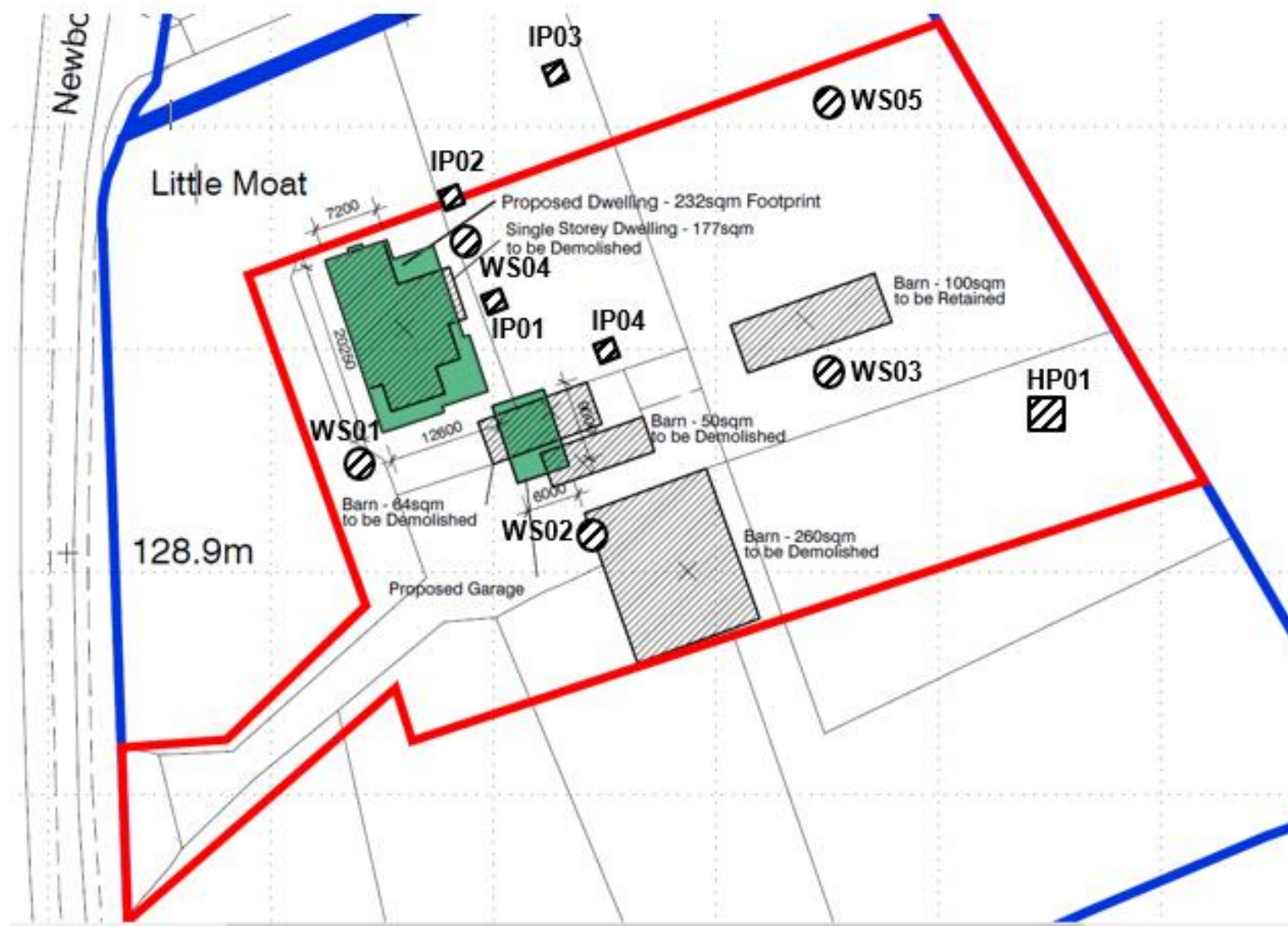
11.4.3 CL:AIRE

- [16] Card G, Wilson S, Mortimer S. 2012. *A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17.* CL:AIRE, London, UK. ISSN 2047- 6450 (Online)

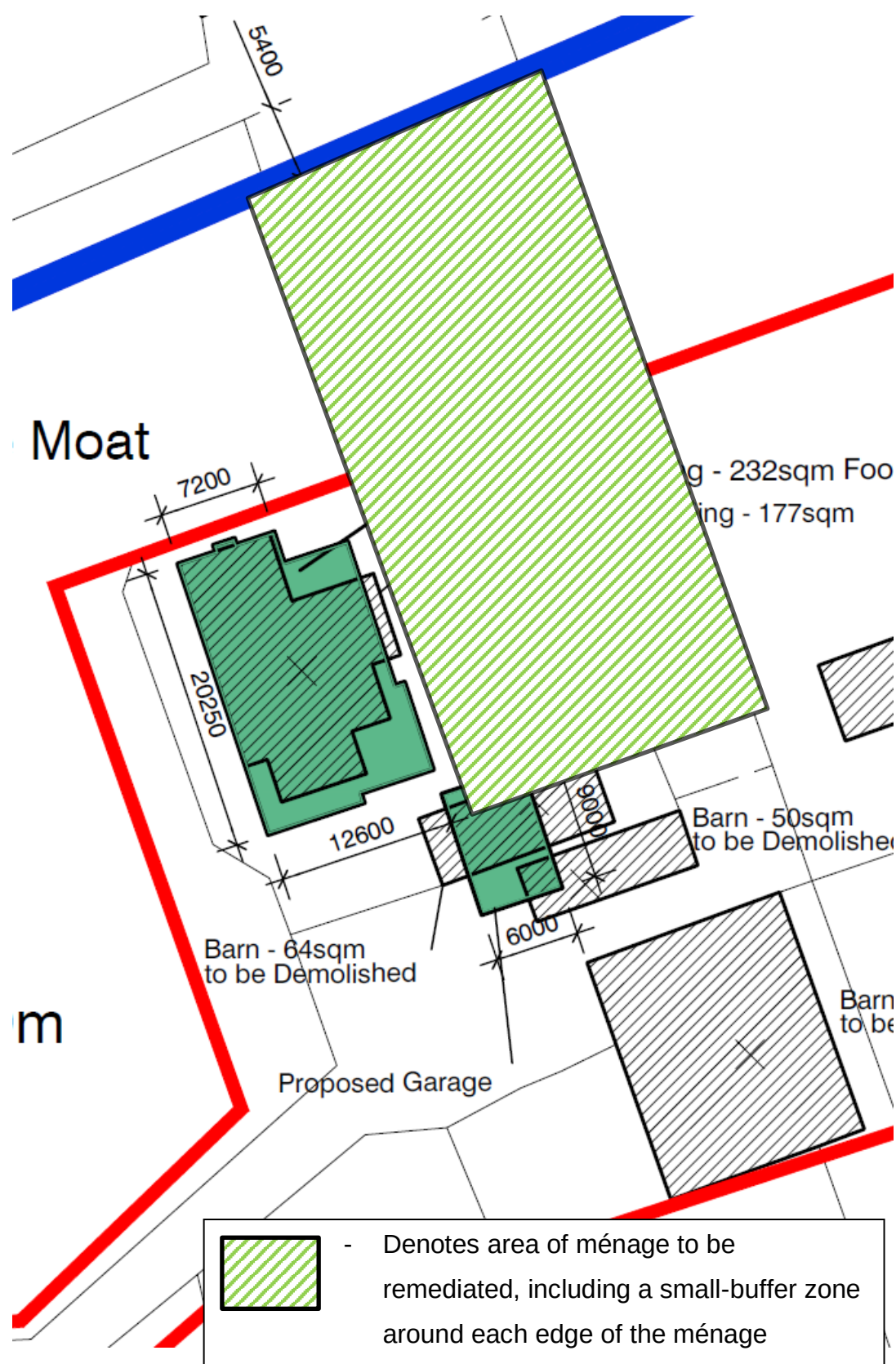
12.0 APPENDICES

APPENDIX A

PHASE 2 SAMPLE LOCATION PLAN



APPENDIX B SITE REMEDIATION PLAN



APPENDIX C

DISCOVERY STRATEGY

