



**Castledine
Environmental**

LAND CONTAMINATION SURVEYS

Phase 3 Remediation Strategy and Verification Plan

for

**The Conversion of an Existing
Agricultural Building into a
Dwellinghouse**

on the site of

**Ratcliffe House Farm,
Ratcliffe House Lane,
Ratcliffe Culey, Atherstone,
Leicestershire CD9 3LZ**

Date: November 2024

Status:

Final Report

Reference:

3833D P3 Garland - Atherstone

Date:

06/11/2024

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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.

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 Ms. Garland to undertake a Phase 3 Remediation Strategy and Verification Plan on a site at Ratcliffe House Farm, Ratcliffe House Lane, Ratcliffe, Culey, Atherstone, Leicestershire CV9 3LZ.

4.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of Ms. Garland and his appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework (NPPF) 2023.
- Part C1 of the building regulations.
- Support of Planning Application No. 23/01207/P3CQ.

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:

- BS10175:2011+A2:2017, Investigation of potentially contaminated sites. Code of practice;
- BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings;
- LCRM "Land Contamination Risk Management"; and
- CIRIA C795 "Retrofitting Hazardous Ground Gas Protection Measures in Existing or Refurbished Buildings".

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; and

- 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.

This report has been produced in order to discharge any relevant planning conditions outlined by the Local Authority and Environment Agency; however, further requirements may be imposed after the findings of this report that may need to be addressed at a later date.

5.0 SITE DESCRIPTION

The site is located in Atherstone, Leicestershire at National Grid Reference: 433677,298839 and is approximately 0.1ha in area.

The site is rectangular in shape and is orientated slightly north east to south west. The site is located within a wider, associated farmyard and is directly bounded by a wooded area to the north, a parking and turning area associated with the adjacent dwelling to the east, a concreted yard area directly south and west with 2 No. large barns located directly west and north west of site.

The site interior comprises a large, relatively modern and well-maintained Dutch-barn, with the southern face of the structure being open and very limited exterior areas. Access to site was provided via a private access route of approximately 0.37km length and leading southwards off Ratcliffe House Lane, to the north of site.

The barn was seen to be constructed of concrete flooring and walling, timber cladding and steel structuring with corrugated roofing materials (which post-date asbestos regulations). The southern half of the roofing was seen to be occupied by solar panelling. The interior of the structure was seen to be in use for the storage of various large tractors and their associated trailers and agricultural attachments.

Some minor staining, including a small oil stain was noted atop the concrete within the barn, however, the concrete was seen to be intact and in a good condition.

The eastern face of the structure is then occupied by storage units, which are outside the site boundary, however are adjoined to the barn itself. These units were seen to be constructed of brick with concrete flooring (again, noted to be in a good condition). The units were seen to contain a quad bike and chemical / pesticide tank and sprayer attachment and associated agricultural items.

The remaining areas on site then comprise a thin strip of soft-landscaping to the rear (north) of the barn, where some made ground gravels were noted underfoot, beneath the vegetation; and the concreted yard / vehicle movement area directly south of the barn. Just offsite and directly north west of site a propane tank was noted.

The storage and usage of heavy machinery, the minor staining noted beneath the machinery and the potentially asbestos containing, corrugated roofing materials are considered potential sources of contamination noted on the site walkover. Topographically, the site is level.

Photos of the site can be found as Appendix D of the previous Phase I Report for the site.

6.0 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 Ratcliffe House Farm, Atherstone, Leicestershire – Produced by Castledine Environmental in May of 2024 and referenced: 3730D
- Phase 2 Land Contamination Risk Assessment for site at Ratcliffe House Farm, Atherstone, Leicestershire – Produced by Castledine Environmental in October of 2024 and referenced: 3779D

The most pertinent information is summarised in the following sections.

6.1 SUMMARY OF SOIL CONTAMINATION

The previous report for the site found that the site is currently occupied by a Dutch-barn – in use for the storage of heavy farm machinery and adjoined storage units – and limited exterior areas comprising both concrete and a thin strip of soft-landscaping, which have been present on site since at least circa.2006.

Accordingly, a Phase 2 Site Investigation has been carried out on site, comprising trial pitting and environmental sampling. The results of the investigation showed that hydrocarbon impacted made ground deposits exist on site (and likely beneath the subbase to the existing barn).

Environmental sampling results identified:

- Benzo(b)fluoranthene GAC of 2.6mg/kg by readings of 7.25mg/kg and 11.19mg/kg at the locations of TP01 at 0.30m depth and TP02 at 0.20m depth, respectively;
- Benzo(a)pyrene GAC of 2.2mg/kg by readings of 7.83mg/kg and 10.47mg/kg at the locations of TP01 at 0.30m depth and TP02 at 0.20m depth, respectively;
- Dibenzo(a,h,)anthracene GAC of 0.24mg/kg by readings of 1.42mg/kg and 1.72mg/kg at the locations of TP01 at 0.30m depth and TP02 at 0.20m depth.
- Aromatic C21-C35 (1282mg/kg) exceeds the TAC of 1100mg/kg at the location of TP02 at 0.20m depth.

6.2 SUMMARY OF GROUND GAS REGIME

The previous report for the site identified no significant potential sources of ground gas generation, with ponds in the local area remaining persistent until the present-day (allowing for vertical release of any ground gases) and an unspecified pit located approximately 354m east of site (infilled by circa.1965-1966) has been discounted as a potential hazards to site, as no credible pathways are present (no superficial geological deposits present and bedrock geology – Gunthorpe Member – is predominantly low in permeability) nor has any clear pressure gradient been identified nor topographical difference noted.

6.3 SUMMARY OF HAZARDOUS VAPOURS (REASSESSMENT)

The previous report considered the storage of plant / farm machinery on site along with noted, very small-scale staining of hydrocarbons atop the concrete within the barn and the general agricultural usage of the site to be potential sources of hazardous vapours which should be investigated further. Accordingly, hydrocarbon sampling was carried out on site, which identified:

- Aromatic C21-C35 (1282mg/kg) exceeds the TAC of 1100mg/kg at the location of TP02 at 0.20m depth.

More volatile hydrocarbon fractions (VPH) are all below LOD, with heavier end (above EC10-12) not considered particularly volatile. Additionally, the made ground has been seen to be 0.35-0.50m in depth, and therefore not considered to be a significant source of vapours at this thickness, with the overlying concrete base seen to be in a very good, intact condition and as such, will act to protect the overlying development. Additionally, any remaining hydrocarbons would be considered a diminishing source, and further degradation will occur over time, and no evidence of hydrocarbon contamination has been identified within the underlying natural strata.

7.0 CAPPING OF SOFT LANDSCAPING AREAS

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, in this case, it is recommended that a *minimum* of 600mm of pre-certified, clean materials are imported to site and laid in areas of proposed soft-landscaping. As a matter of prudence and to avoid remixing of residual site soils and imported, fresh soils, it is recommended that all areas of soft-landscaping are emplaced atop a high-visibility, woven geotextile.

Prior to the spreading of the imported material, the receiving area should be decomposed 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. 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. Castledine Environmental can carry this out, should certification not be provided to the relevant Local Authority. 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:

- 3 No. samples for every 15m³ (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; and
- Pesticide suite (from agricultural sources).

Environmental samples of imported materials will be tested inline with current CLEA Soil Guideline Values and relevant Generic Acceptance Criteria (GAC) and SGVs.

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 POTABLE SUPPLY PIPING

Due to the identified hydrocarbon impacted made ground and subbase on site (PAHs and TPH CWG), it is recommended that the local water supplier be contacted regarding barrier piping specification – once service proposals are known OR that any new potable piping is laid in a fresh, clean excavation and is suspended in an inert pea-gravel matrix, to prevent contact with residual site soils.

9.0 GAS PROTECTION MEASURES DESIGN

As discussed in Section 6.3, ground gas and VOC hazards have been discounted as such, the need for ground gas and VOC protection is not considered a requirement.

10.0 VERIFICATION PLAN**10.1 CAPPING MATERIAL****10.1.1 VERIFICATION OF CORRECT DEPTH OF COVER LAYER**

- **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.

10.1.2 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; and
- Inclusion of geographic background features which will aid locating the photograph.

11.0 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 B) 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.

12.0 REPORTING

12.1 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; and
- Good quality photographs as indicated in section 10.1.2.

12.2 GAS PROTECTION

Reporting of the verification activities will be completed following a site visit and verification of the installed gas protection measures. The verification report will summarise the extent to which the remedial methods have been achieved and supporting documentation to include site plans and membrane photographs.

13.0 REFERENCES

13.1 LEGISLATION AND REGULATIONS

13.1.1 ACTS

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

13.1.2 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
- [4] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2017 SI2017/No.571

13.1.3 CONTAMINATED LAND REGULATIONS

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

13.2 STATUTORY GUIDANCE

- [8] 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
- [9] Communities and local Government, 2023: National Planning Policy
Framework.

13.3 BRITISH STANDARDS

- [10] BS 5930:2015+A1:2020 Code of practice for site investigations
- [11] BS 10175:2011+A2:2017 Investigation of potentially contaminated
sites - Code of practice
- [12] BS 8485:2015+A1:2019 Code of practice for the design of protective
measures for methane and carbon dioxide ground gases for new
buildings
- [13] BS 8576:2013 Guidance on investigations for ground gas.
Permanent gases and Volatile Organic Compounds (VOCs)
- [14] BS 10176:2020 Taking Soil Sample for Determination of Volatile
Organic Compounds (VOCs)

13.4 NON-STATUTORY TECHNICAL GUIDANCE**13.4.1 ENVIRONMENT AGENCY**

- [15] Land Contamination Risk Management (LCRM) 2020, updated 2023

13.4.2 CIRIA PUBLICATIONS

- [16] 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
- [17] 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

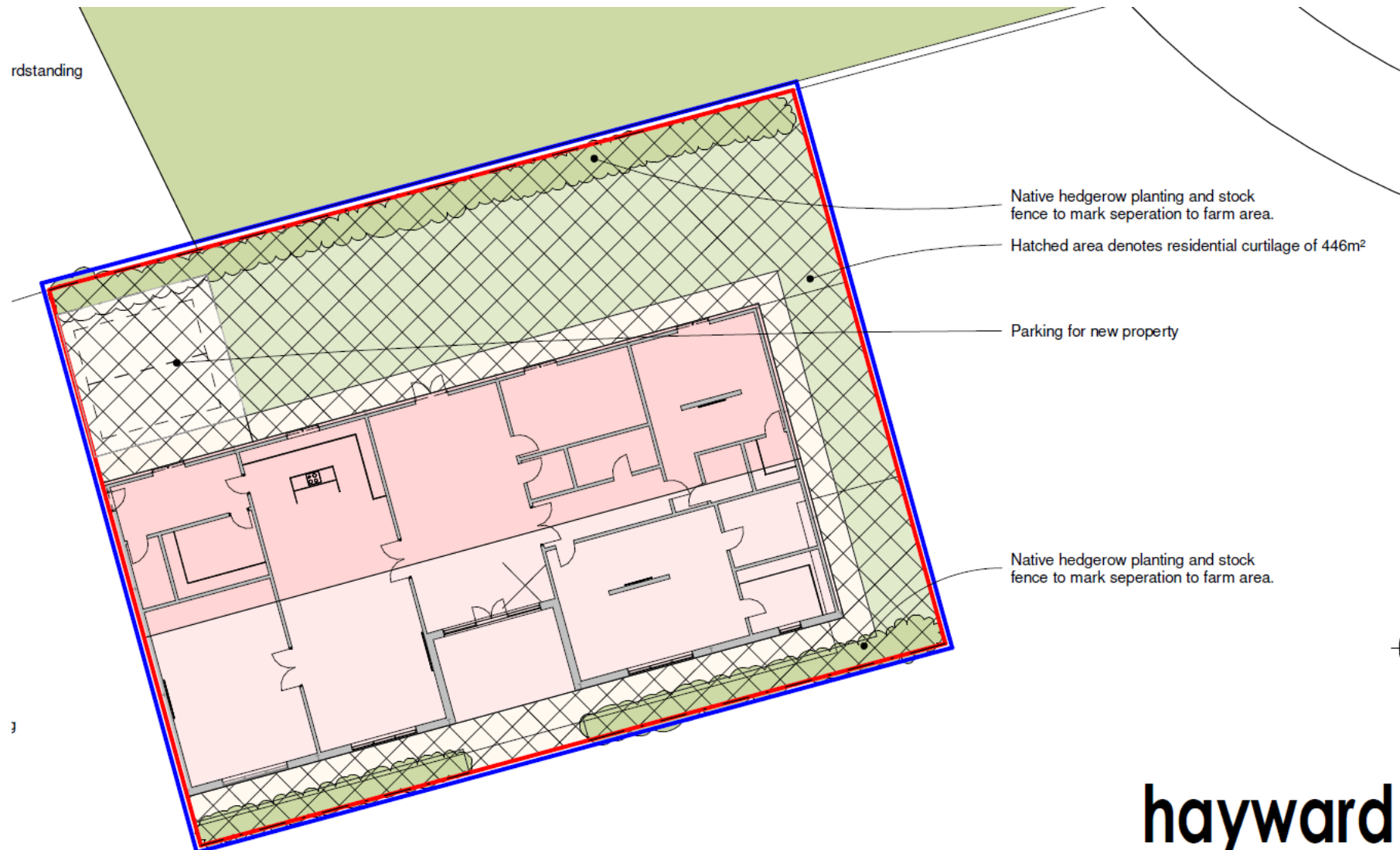
13.4.3 CL:AIRE

- [18] 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)

14.0 APPENDICES

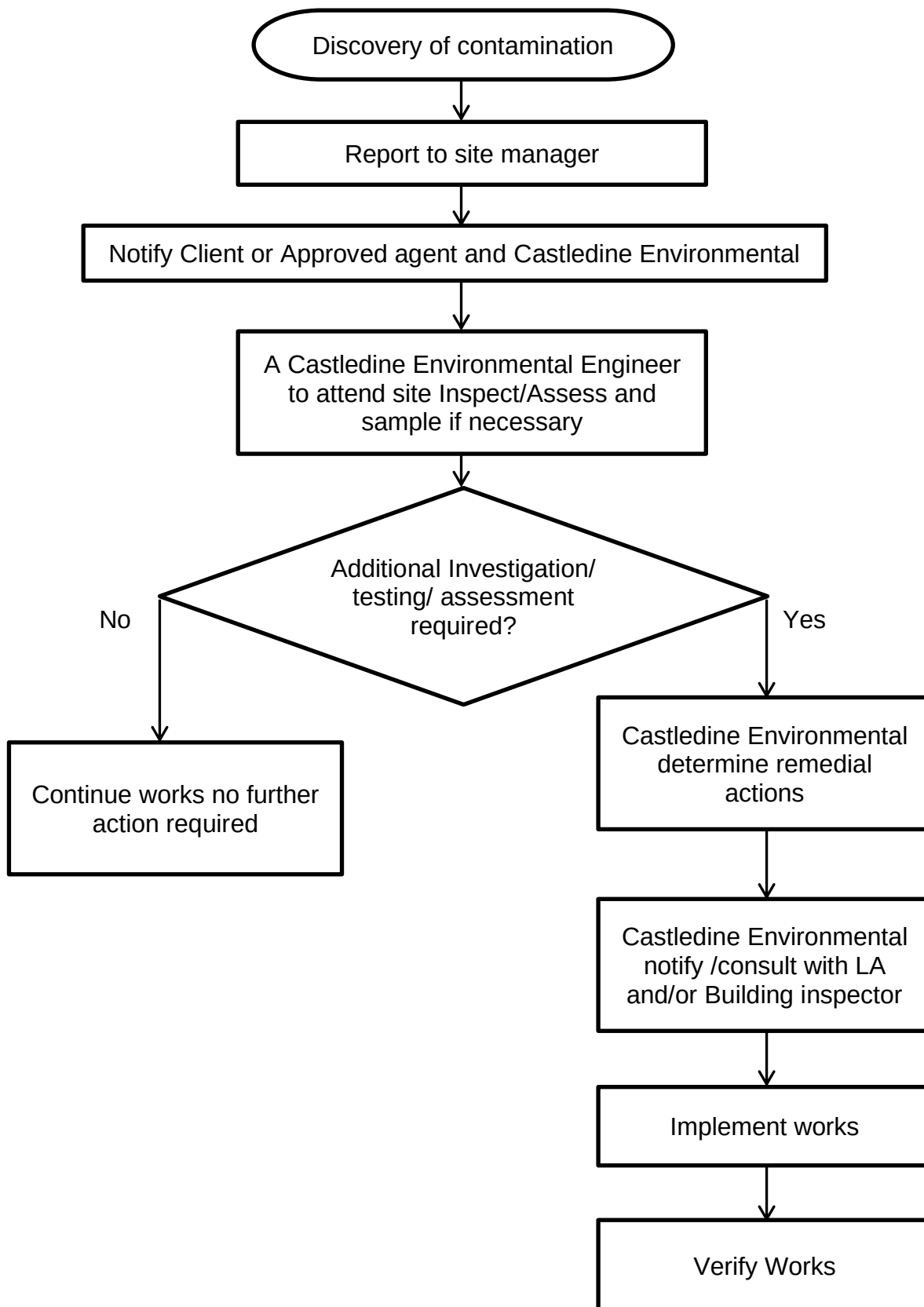
APPENDIX A

PROPOSED SITE PLANS



APPENDIX B

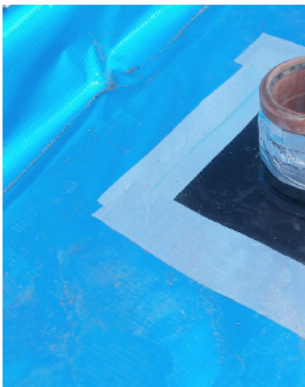
DISCOVERY STRATEGY



APPENDIX C

VISQUEEN GAS BARRIER SPECIFICATIONS SHEET

DATASHEET	Technical Support: 0333 202 6800 LAST UPDATED: 06.11.2019	 Gas Barrier CE Mark to EN 13967
	Page 1	



- BBA approved, fully complies with BS8485:2015
- Low permeability to methane, radon and carbon dioxide
- Approved for use in NHBC Amber 2 applications
- Multi-layer reinforced LDPE membrane with aluminium core
- High puncture and tear resistance

Description

Visqueen Gas Barrier is a 400 gsm multi-layer reinforced polyethylene membrane with an integral 20 micron aluminium foil that is approved for use in BS8485:2015 and NHBC Amber 2 applications. For ease of identification on site Visqueen Gas Barrier is coloured blue on one side and silver on the reverse. The barrier combines strength and performance with flexibility and easy installation. Visqueen Gas Barrier also acts as a damp proof membrane.

BS8485:2015

When risk assessing under BS8485:2015 for sites which are effected by methane and carbon dioxide then the Visqueen Gas Barrier is an ideal solution.

The membrane has been modified to be 400 gsm with the multi layer structure greatly enhanced to improve its puncture and impact performance.

Visqueen utilise a 20 microns foil to avoid issues associated with thinner (12microns) foils.

Application

The Building Regulations require that proper precautions be taken to prevent danger to health and safety when building on contaminated land. Visqueen Gas Barrier offers a safe solution for the protection of buildings against methane, radon, stythe (a gas commonly found from disused mines, also known as blackdamp), and carbon dioxide, when installed in accordance with the relevant codes of practice such as BRE, CIRIA and the Chartered Institute of Environmental Health Ground Gas Handbook

Typically these are sites previously used as coalfields, landfill or are contaminated industrial sites.

The membrane should be installed blue side up

System components

- Visqueen Double Sided Jointing Tape
- Visqueen Gas Resistant (GR) Foil Tape
- Visqueen Top Hat Units
- Visqueen TreadGUARD1500
- Visqueen Detailing Strip

Installation Guidelines

Visqueen Gas Barrier and ancillary components must be installed in accordance with the recommendations of Building Research Establishment BRE 414 "Protective measures for housing on gas contaminated land" and CIRIA C665 "Assessing risks posed by hazardous ground gases to buildings", NHB C guidelines, and the Chartered Institute of Environmental Health Ground Gas Handbook. The product is not intended for use where there is a risk of hydrostatic pressure. **The membrane should be installed blue side up**

The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish. In areas where high levels of unsupported membrane occur it is recommended that Visqueen Pre Applied Membrane is used. To avoid slip or shear planes and high compressive loadings it is not recommended




to take the membrane through the wall. In order to provide a continuous barrier across the cavity Visqueen Gas Resistant DPC should be taken through the blockwork and incorporated below the damp proof course cavity tray in the outer leaf.

Laps can be joined together by either using the Visqueen Gas Barrier jointing system or welded by our specialist on-site contractors.

Jointing and Sealing

Visqueen Gas Barrier should be overlapped by at least 150mm (Welded membranes can be by less than 150mm as long as the joint integrity is not compromised) and bonded with Visqueen Double Sided Tape. The joint should be secured with Visqueen Foil Backed Girth Jointing Tape. Ensure that the membrane is clean and dry at the time of jointing

Airtight seals should be formed around all service entry points. Visqueen Pre-formed Top Hat Units must be used for sealing service entry pipes. The base of the top hat should be sealed using Visqueen Double Sided Tape and Visqueen Foil Backed Girth Jointing Tape is used to secured the joint

Punctures

If the membrane is punctured or perforated, then a patch of material with identical thickness should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Double Sided Jointing Tape and seal with Visqueen Foil Backed Jointing Tape. Alternatively a patch can be formed using Visqueen Detailing Strip and lapped at least 150mm beyond the limits of the puncture. External and Internal corners should be round and reinforced with Visqueen Detailing Strip. Where this is not possible and the 3 dimensional shapes are complex it is recommended a pre-formed unit is used.

NB. In demanding site conditions use Visqueen GR Lap Tape as a high performance alternative to Visqueen Foil Jointing Tape.

Ventilation

When medium to high levels of ground gases are present or when the generation of gases still occurs, then an open void beneath the ground floor should be constructed, as ventilation beneath the ground floor will dilute and disperse the gases to atmosphere. Open voids are normally restricted to beam and block floors or other precast concrete floor systems, an alternative for providing ventilation to in situ concrete floor slabs is to install a Visqueen Ventilation System.

Covering

Visqueen Gas Barrier should be covered by a protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from contacting the barrier.

It is recommended that the barrier is covered with Visqueen Protection Boards or screed before positioning the reinforcement. When underfloor heating is being installed, it is recommended that the barrier is positioned between the blinded hardcore and insulation. This will protect the insulation from moisture and avoid any risk of overheating the membrane.

Storage and Handling

Visqueen Gas Barrier is classified as non-hazardous when used in accordance with the relevant Code of Practice (CP 1021973). The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils. The material is not recommended for uses where it will be exposed to long periods of outdoor weathering as exposure to ultraviolet light will embrittle the product. Weathering will not occur when the membrane is installed in accordance with CP102 1973. Care should be taken to avoid accidental damage when handling the membrane on site. When the weather is cold, Visqueen Double Sided Jointing Tape and Visqueen Foil Backed Girth Jointing Tape should be kept in a warm, dry place until needed. Installation is not recommended below 5°C.

Technical Data and CE Mark



Technical Support: 0333 202 6800
LAST UPDATED: 06.11.2019



Gas Barrier
CE Mark to EN 13967

Page 3

Visqueen Gas Barrier complies with the requirements and clauses of EN 13967 - Flexible sheets for waterproofing - Plastic and rubber damp proof sheets including plastic rubber basement tanking sheet - Definitions and characteristics.

British Board of Agreement performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control, and issued the certificate of constancy of conformity of the factory production control 0836-CPR-13/F060 applies.



DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 06.11.2019



Gas Barrier
CE Mark to EN 13967

Product Data

Product Data

heading	Characteristic	Test method	Units	Compliance criteria	Value or Statement
	Visible defects	EN 1850 -2	-	Pass/Fail	Pass
	Length	EN 1848-2	m	-0%/+10%	25 or 50
	Width	EN 1848-2	m	-0%/+10%	2
	Overall thickness including grid	EN 1849-2	mm		0.66
	Effective thickness in between scrim	EN 9863-1	mm		0.4
	Mass	EN 1849-2	g/m2	-0%/+5%	400
	Tensile Strength - MD	EN EN12311	N	MDV	391
	Tensile Strength - CD	EN EN12311	N/mm2	MDV	588
	Tensile Elongation - MD	EN EN12311	%	MDV	20
	Tensile Elongation - CD	EN EN12311	%	MDV	21
	Joint Strength	EN12317-2	N	>MLV	332
	Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
	Resistance to impact	EN 12691	mm	>MLV	200
	Dart Impact	BS 2782	g	MDV	731
	Low temperature flexibility	EN 495-5	oC	-40	Pass
	Durability against ageing	EN 1296 and EN 1928	-	Pass/Fail	Pass
	Durability Chemical Resistance	EN 1847	-	Pass/Fail	Pass
	Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	358
	Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	368
	Resistance to static loading	EN 12730	Kg	>MLV	Pass 20
	Water vapour transmission - resistance	EN 1931	MNs/g	MDV	7000
	Water vapour transmission - permeability	EN 1931	g/m2/d	MDV	0.03
	Reaction to Fire	EN 13501-1	Class	MDV	F
	BS8485:2015 testing requirements				
	Mass	EN 1849-2	g/m2	Average >370	400
	Methane Permeability	ISO15105-1	mls/m2/d/atm	Pass/Fail	<40 Pass
	Puncture CBR	BS EN ISO 12236	N	MDV	1114
	Impact resistance	EN12691	mm	MDV	1000
	Tensiles Yield strength MD	ASTM D4885-01	kN/m	MDV	12.5
	Tensiles Yield strength CD	ASTM D4885-02	kN/m	MDV	7.3
	Yield elongation MD	ASTM D4885-03	%	MDV	18
	Yield elongation CD	ASTM D4885-04	%	MDV	19
	Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	48.2
	Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	44.8
	Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	53.5
	Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	60.6



Technical Support: 0333 202 6800
LAST UPDATED: 06.11.2019



Gas Barrier
CE Mark to EN 13967

Appendix A

About Visqueen

Visqueen is the market leader in the manufacture and supply of structural waterproofing and gas protection systems. Visqueen offers the complete package – a proven, reliable range backed by a technical support service that goes unmatched in the market - everything you would expect from a reputable and ethical company.

Complete Range, Complete Solution

- Structural Waterproofing
- Damp Proof Course
- Damp Proof Membranes
- Gas Protection and Gas Venting
- Vapour Control Layers
- Stormwater Protection

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- Technical Datasheet
- Standard Details
- Technical Service
- Visqueen Gas Protection Brochure
- NBS Clauses
- BBA Certificates
- Material Safety Datasheets
- Specification Guide

Find your local stockist

Search our directory of Visqueen specification [Specialist Centres](#) to locate your nearest Visqueen Partner.

Technical support throughout your project

We are specialists in our field and can help you specify the correct solutions with the necessary performance levels, in accordance with building regulations.

- Nationwide site support team
- Specification advice
- Installation guidance & project sign off
- System design including CAD details

CPD Seminars and Training Academy



Gas Protection CPD

The specification, technical design, and installation of gas protection systems, enabling the sustainable regeneration of brownfield sites.



Structural Waterproofing CPD

The specification, technical design, and installation of structural waterproofing systems for protection against water and damp ingress in both above and below ground projects.



Visqueen Training Academy

We are now able to offer exclusive in depth training opportunities on a wide variety of Visqueen products at our Training Academy.



Visqueen Special Projects

We provide high-level expertise, comprehensive support and experience in all types of waterproofing and gas protection.



Part of RPC Ltd group

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