ERGO

ENVIRONMENTAL LTD

GROUND GAS PROTECTION MEASURES VALIDATION REPORT

Land to the rear of Suncroft, Warkworth, Northumberland

Prepared for:

Mr and Mrs Walton

Report Ref: 22-1214-GVAL1
Date Issued: February 2023

ERGO LIMITED

Hoults Yard,
Walker Road,
Newcastle upon Tyne,
NE6 2HL

Tel : + 00 (0) 191 389 6200
http:\\www.ergoenvironmental.com

Registered in England
No.: 11162116

QUALITY ASSURANCE

REMARKS	Final
DATE	February 2023
PREPARED BY	P Craigie
QUALIFICATIONS	Beng
SIGNATURE	[redacted]
CHECKED BY	J Malley
QUALIFICATIONS	MSc, BSc, MCIWEM, C.WEM
SIGNATURE	[redacted]
AUTHORISED BY	J Nairn
QUALIFICATIONS	MSc, BSc, MIENvSc, CEnv, FGS
SIGNATURE	[redacted]
PROJECT NUMBER	22-1214

QR007-1

Table of Contents

1. INTRODUCTION 3
1.1 Introduction 3
1.2 Site Setting 3
1.3 Proposed Development 3
1.4 Objectives 3
1.5 Sources of Information 4
1.6 Limitations 4
1.7 Confidentiality 4
2. SUMMARY OF PREVIOUS ASSESSMENTS 5
3. VALIDATION SPECIFICATION 6
3.1 Site Works 6
3.2 Membrane Specification 6
3.3 Filoseal Specification 6
3.4 Verifiers 6
4. GENERAL CONDITION OF MEMBRANE 7
5. VERIFICATION OF JOINTS & CORNER UNITS 9
6. VERIFICATION OF SUBFLOOR VOIDS AND VENTILATION 11
7. VERIFICATION OF SERVICE ENTRIES 13
8. CONCLUSIONS 15

APPENDICES

Appendix I Limitations
Appendix II Glossary
Appendix III Drawings
ERGO Drawing No 22-1214-001 - Site Location Plan
ERGO Drawing No 22-1214-002 - Proposed Site Layout Plan
Heddon Structures Ltd Drawing No 0458-DR-S-004 – Foundation Sections
Appendix IV Gas Membrane and Filoseal Data Sheets
Appendix V Gas Validation Record Sheet

1. INTRODUCTION

1.1 Introduction

ERGO have been appointed by Mr & Mrs Walton to validate the adequate installation of required ground gas mitigation items within proposed plots at the site.

This report includes validation of the specific details of gas protection measures installed within the properties, to fully protect the future site residents as outlined within the ERGO Gas Verification Strategy Report.

1.2 Site Setting

Site Address	Land to the Rear of Suncroft, Station Road, Warkworth, NE65 0XP.
National Grid Reference	E424780, N606370.

1.3 Proposed Development

ERGO understands that Mr and Mrs Walton intend to develop the site with 2no. residential dwellings and garages with associated infrastructure and access road.

A proposed development plan is indicated within ERGO Drawing 22-1214-002 within Appendix III. A snapshot of the proposed development is presented within Figure 1.1 below.

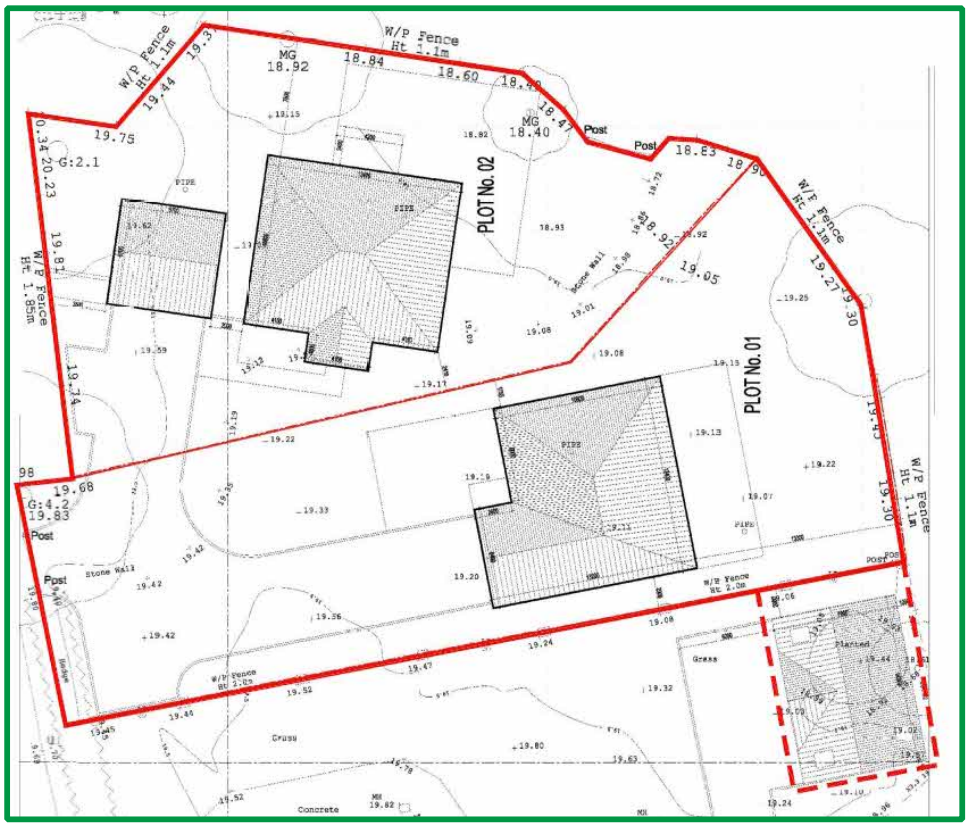


Figure 1.1 Snapshot of Proposed Development

1.4 Objectives

The objectives of the Verification Reporting are to:

- Document, validate and verify the installation of appropriate ground gas mitigation measures within the constructed properties to mitigate potential risks in accordance with the agreed Ground Gas Verification Strategy.

1.5 Sources of Information

The following reports have been reviewed to complete this Validation Report:

Intersoil – *Environmental Study* Ref: 12023/amd2, dated June 2013.

Intersoil – *Environmental Soils Investigation Report*. Ref: 20003, dated January 2020.

ARC Environmental – *Preliminary Data Sheet* Ref: Report No.20-610, dated May 2021.

ERGO – Ground Gas Verification Strategy Ref: 22-1214-R01, dated May 2022.

The following guidance documents have been reviewed to complete this Verification Strategy:

- BS 8485:2015 (+A1 2019), 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings';
- CIRIA C735 (2014), 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gases';
- YALPAG Technical Guidance for Developers, Landowners and Consultants, 'Verification Requirements for Gas Protection Systems';
- ASTM D4437/D4437M (2018), 'Standard Practice for Non-destructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheer Geomembranes'.

1.6 Limitations

For the avoidance of doubt, works associated with the installation of Filoseal around service penetrations was beyond the scope of agreed works with confirmation available from the Developer.

1.7 Confidentiality

ERGO has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from ERGO; a charge may be levied against such approval.

2. SUMMARY OF PREVIOUS ASSESSMENTS

The previous investigation by ARC Environmental suggested the site be classified as Gas Characteristic Situation 2/Amber 1 following a review of the completed ground gas monitoring data identifying elevated carbon dioxide levels (>5%) and depleted oxygen levels (19%).

This assessment is understood to have been accepted by Northumberland County Council.

ERGO subsequently produced a Ground Gas Verification Strategy Report (Ref: 22-1214-r01, dated May 2022) to mitigate potential risks. This strategy has been accepted by Northumberland County Council.

3. VALIDATION SPECIFICATION

3.1 Site Works

ERGO Ltd have attended the site on 4no. separate occasions between 10th June 2022 and 24th February 2023 to verify the condition of the membrane installed within Plots 1-2 and the associated garage in accordance with the ERGO Gas Verification Strategy ref: 22-1214-r01, dated May 2022.

Works were undertaken in accordance with the outlined detailed design specification for foundations as indicated within Hedley Structures Drawing 0458-DR-S-004-Rev4, enclosed within Appendix III.

The visits were undertaken to coincide with the completion of each set of plots and immediately prior to the laying of insultation and pouring of the concrete screed.

3.2 Membrane Specification

In accordance with the outlined specification, ERGO can confirm that the Visqueen Gas Barrier Gas Membrane, complaint with BS 8485:2015 + A1:2019, was used within the plots.

A product data sheet is available within Appendix IV.

3.3 Filoseal Specification

In accordance with the outlined specification, ERGO can confirm that Filoseal was used within the plots.

A product data sheet is available within Appendix IV.

3.4 Verifiers

3no. trained ERGO Verifiers attended site to inspect the works undertaken. Details pertaining the verifiers, their experience and qualifications are detailed below:

- Jonathan Malley BSc, MSc, MCIWEM C.WEM – Associate Director

Jonathan has 7 years of experience within the Geo-Environmental Sector. He has completed Ground Gas Risk Assessments for sites, documented appropriate mitigation items and verified the adequate installation of these measures on numerous projects.

Jonathan attended the CL:AIRE Gas Verification course in February 2019.

- Kevin Flannigan BSc (Hons) – Senior Design Manager

Kevin has over 15 years of experience within the Construction Industry as an Architectural Technologist.

Kevin attended the CL:AIRE Gas Verification course in January 2023

Further details and case studies for the verifier(s) can be made available on request.

- Jess Campbell BSc (Hons) – Geo-Environmental Consultant

Jess has 4 years of experience within the Geo-Environmental Sector. She has completed Ground Gas Risk Assessments for sites, documented appropriate mitigation items and verified the adequate installation of these measures on numerous projects.

Jess attended the PA Geotechnical Gas Verification course in November 2021.

Further details and case studies for the verifier(s) can be made available on request.

4. GENERAL CONDITION OF MEMBRANE

The membrane comprised a Visqueen Gas Barrier gas membrane resistant to carbon dioxide and low levels of methane. The photographs show the general condition of the plot membranes prior to the laying insulation and pouring the concrete screed. Plot were swept prior to the laying of the gas membrane. Installation was completed by means of perimeter and infill.

Where damage was observed during the inspection, suitable repair was undertaken as necessary under supervision by ERGO to ensure the membrane was installed appropriately. ERGO can confirm there were no holes or rips in the membrane prior to the laying of insulation and pouring of the concrete.

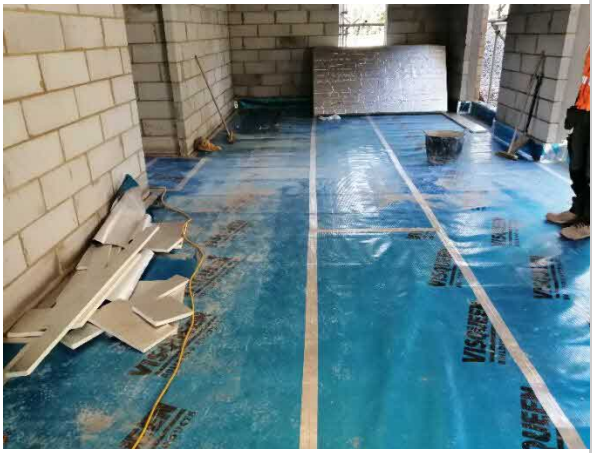
PLATE 1	PLATE 2
	
General overviews of membrane at Plot 1 following internal placement. No materials were stored on the membrane which had the potential to cause damage.	
PLATE 3	**PLATE 4**
	
General overviews of membrane at Plot 2 following internal placement. No materials were stored on the membrane which had the potential to cause damage.	

PLATE 5	PLATE 6
	
General overviews of membrane within the garden following internal placement. No materials were stored on the membrane which had the potential to cause damage.	

5. VERIFICATION OF JOINTS & CORNER UNITS

All external joints were inspected and ERGO can confirm that the membrane was overlapped and taped appropriately. Where evidence of incorrectly sealed gas membrane joints was encountered, contractors were supervised whilst adequate repairs were undertaken. Photos detailing examples of the quality of works under are displayed below.

PLATE 7	PLATE 8
	
General condition of membrane of corner units and joints within Plots 1-2.	

PLATE 9	PLATE 10
	
General condition of membrane of corner units and joints within Plots 1-2. Note protection placed during works within Plate 9.	

PLATE 11	PLATE 12
	
General condition of membrane of corner units and joints within the garage plot.	

6. VERIFICATION OF SUBFLOOR VOIDS AND VENTILATION

Plots were installed with an adequate number of ventilation blocks and can confirm that they appear to be clear of debris and unimpeded. Photos detailing examples of the quality of works are displayed below.

PLATE 13	PLATE 14
	
Periscopic ventilation bricks shown to be free of obstructions in Plots 1-2.	

PLATE 15	PLATE 16
	
Periscopic ventilation bricks shown to be free of obstructions in Plot 1.	

PLATE 17	PLATE 18
	
Showing the sub-floor areas to be clear of waste and/or obstruction. ERGO can confirm a 225mm void was apparent within each substructure.	

7. VERIFICATION OF SERVICE ENTRIES

Service entries were present within the footprint of all plots, adjacent to periphery walls. ERGO inspected each one and can confirm that the service entries have been adequately sealed against the membrane.

PLATE 19	PLATE 20
	
Membrane sealed around service entries within Plot 1. ERGO can confirm these service entries were adequately sealed.	
PLATE 21	**PLATE 22**
	
Membrane sealed around service entries within Plot 2. ERGO can confirm these service entries were adequately sealed.	

PLATE 23	
	
Membrane sealed around service entries within the garage plot. ERGO can confirm these service entries were adequately sealed.	

Following conversation with the Developer, ERGO understand the service penetrations to have been adequately installed with Filoseal products. Details of the installation are available from the developer.

8. CONCLUSIONS

ERGO can confirm that all plots have been installed with gas protection measures in line with Characteristic Situation 2/Amber 1 and in accordance with the approved ERGO Gas Verification Strategy, ref 22-1214-r01.

Based on the information provided within this report, the site inspections and photographic evidence, ERGO can confirm that the structures covered by the report were installed with gas protection measures in accordance with Characteristic Situation 2/Amber 1 to an acceptable level of workmanship.

ERGO confirm that they visited site immediately prior to the pouring of the concrete and confirm that there were no holes or rips in the membrane prior to the pouring of the concrete.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between ERGO and the Client as indicated in Section 1.2.

2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

9. ERGO cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by ERGO is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by ERGO in this connection without their explicit written agreement there to by ERGO.

10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II
GLOSSARY

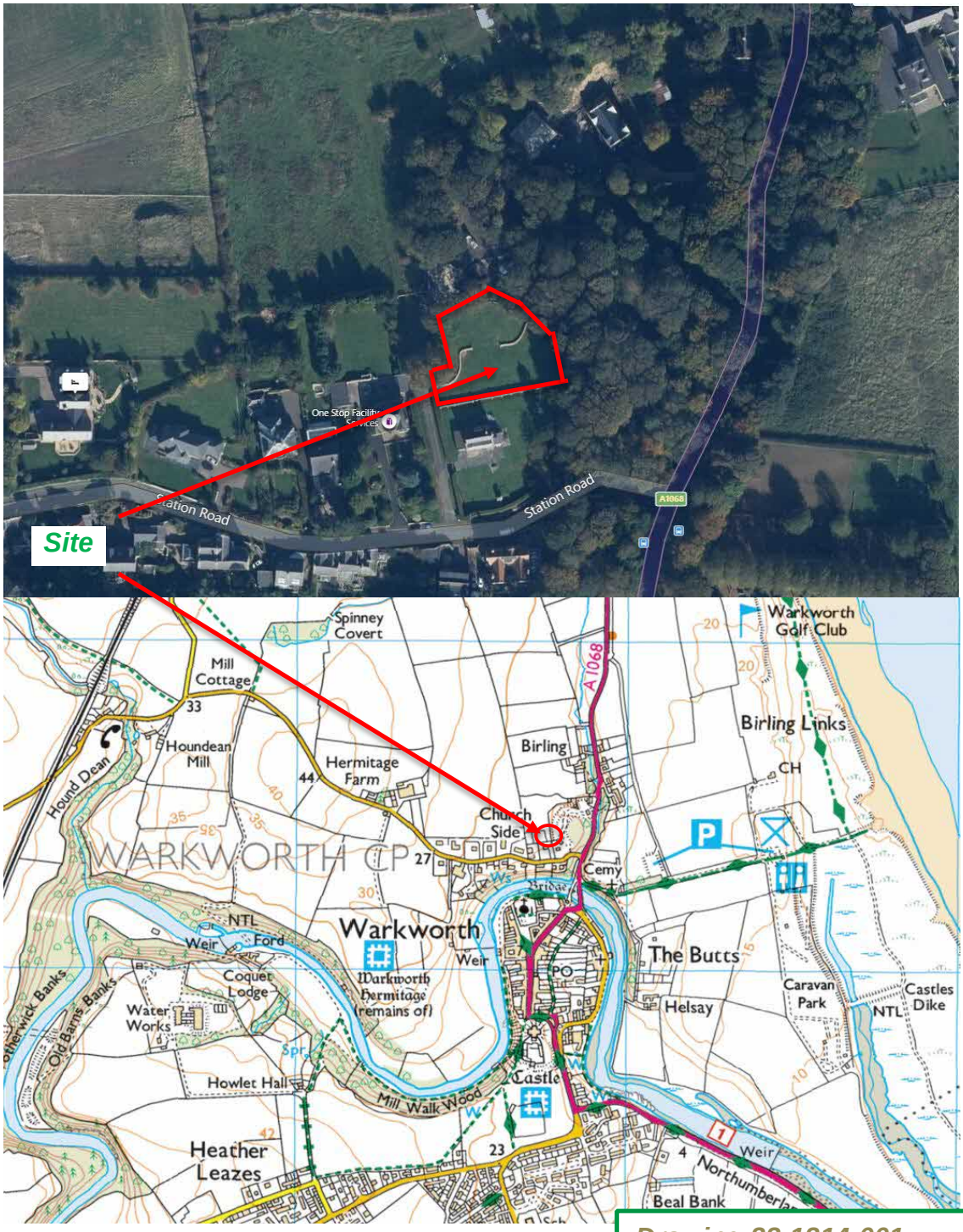
TERMS

AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

UNITS

m	Metres
km	Kilometres
%	Percent
%v/v	Percent volume in air
mb	Milli Bars (atmospheric pressure)
l/hr	Litres per hour
µg/l	Micrograms per Litre (parts per billion)
ppb	Parts Per Billion
mg/kg	Milligrams per kilogram (parts per million)
ppm	Parts Per Million
mg/m^3	Milligram per metre cubed
m bgl	Metres Below Ground Level
m bcl	Metre Below Cover Level
mAOD	Metres Above Ordnance Datum (sea level)
kN/m^2	Kilo Newtons per metre squared
µm	Micro metre

APPENDIX III
DRAWINGS



Drawing 22-1214-001
Site Location Plan

ERGO

Key:

Notes:

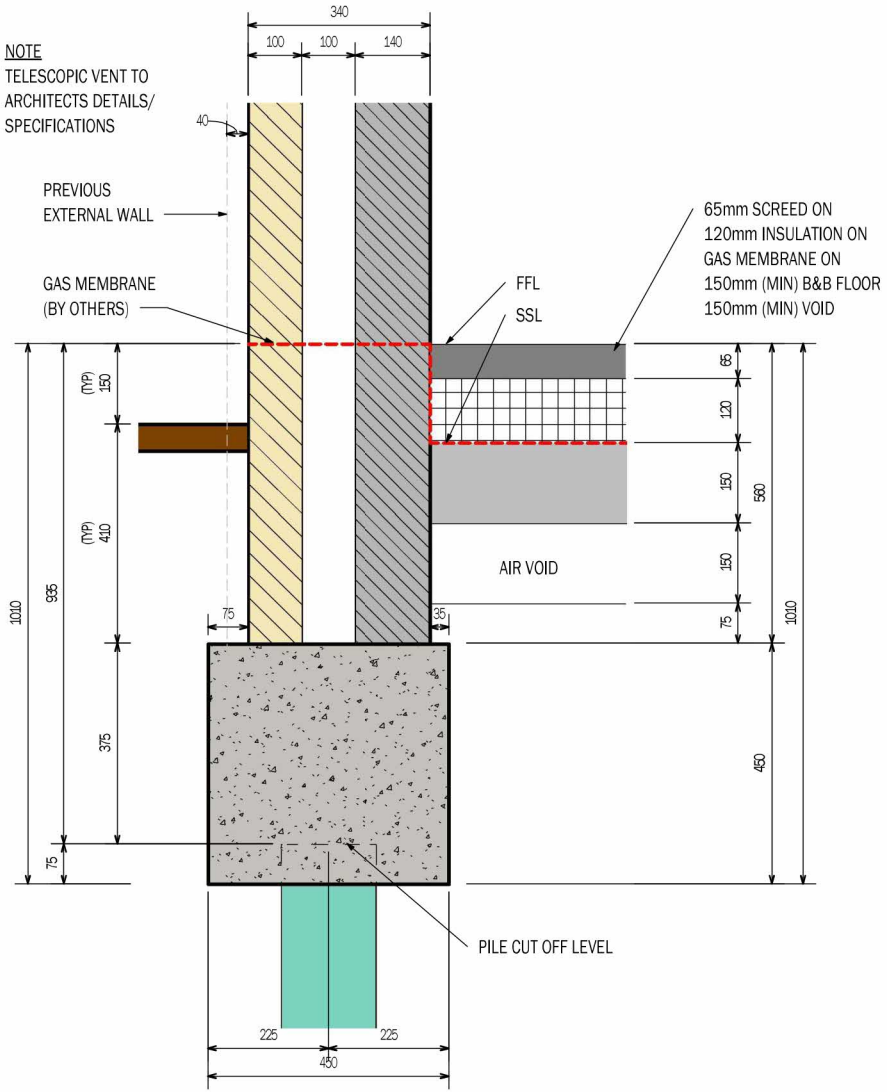
P1	-	05.06.2022	DRAFT	RB	JN
Phase	Revision	Date	Issue	Drawn	Authorised

Client:	Job No:	Date:
Andy Laurie, ALCC Limited	22-1214	05.06.2022
	Drawing No: 002	Scale: NTS
Job Title: Suncroft, Warkworth	Drawing Title: Proposed Development Plan	

ERGO
Ergo Environmental Ltd
Tel: 0191 389 6200
Website: www.ergoenvironmental.com
Email: info@ergoenvironmental.com

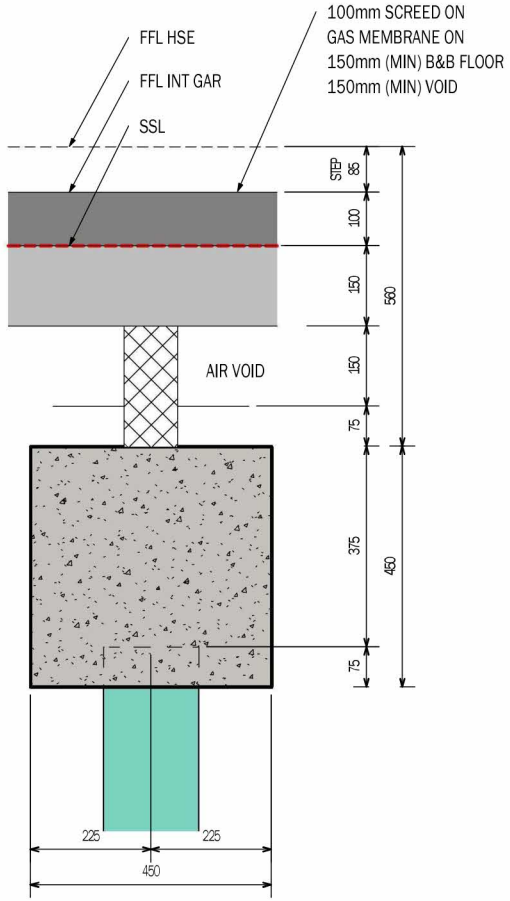
DWG STATUS CONSTRUCTION ISSUE

REV 4 - CONSTRUCTION ISSUE 04-04-22. GROUND BEAM LEVEL RAISED 40mm. GARAGE SCREED DEPTH INCREASED TO 100mm.



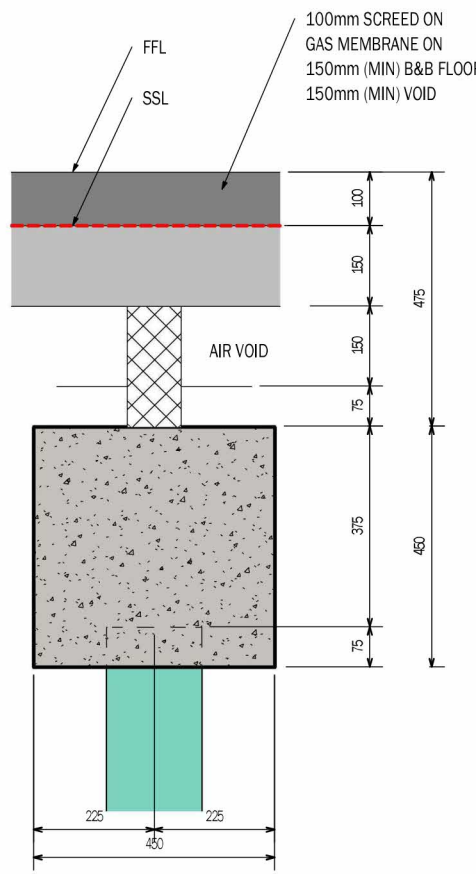
1 PERIMETER DETAIL HSE 1

1 : 10



2 INTERNAL SECTION INTEGRAL GARAGE

1 : 10



3 INTERNAL SECTION DETATCHED GARAGE

1 : 10

Heddon Structures Ltd

CLIENT: ALCC

PROJECT: SUNCROFT WARKWORTH

TITLE: FOUNDATION SECTIONS

SCALE @ A3:	DRAWN	CHECKED	DATE	JOB NO	DWG NO	REV
1 : 10	MH	SC	25/02/22	0458	0458-DR-S-004	4

APPENDIX IV
DATA SHEETS

Technical support: +44 (0) 333 202 6800

Date Published: 11/09/2020

Visqueen Gas Barrier

Features and benefits

- BBA certified - third party accreditation
- Complies with BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Flexible - easy to detail and install on site
- Multi functional - also acts as a radon and damp proof membrane
- Dual jointing methods - lap joints can be taped or heat welded

Product description

Visqueen Gas Barrier is a multi-layer reinforced polyethylene gas barrier with a 20 micron aluminium foil. The barrier is coloured blue on the upper surface and silver on the reverse. The product is supplied in single wound rolls (not folded), 2m x 50m.

Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Suitable for all Characteristic Gas Situation (CS) ground gas regimes
- Conforms to the specification requirements of NHBC Amber 1 and Amber 2 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Barrier is suitable for use in all types of buildings to prevent the ingress of harmful levels of ground gases e.g.methane, carbon dioxide and radon.

The barrier can be positioned above or below a solid concrete ground floor slab or above a precast suspended segmental ground floor system, e.g. beam and block floor.

The barrier can also be used as a high performance radon membrane and/or damp proof membrane.

The product is not intended for use where there is a risk of hydrostatic pressure.

System components

- VisqueenPro Double Sided Jointing Tape, 50mm x 10m
- Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m
- Visqueen Ultimate GR Lap Tape, 150mm x 10m
- Visqueen Ultimate Top Hat Units
- Visqueen Preformed Units
- VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m
- Visqueen TreadGUARD 300, 2m x 75m
- Visqueen TreadGUARD 1500, 1m x 2m

Find your local stockist

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

Technical support: +44 (0) 333 202 6800

Date Published: 11/09/2020

Visqueen Gas Barrier

Storage and handling

Visqueen Gas Barrier should be stored horizontally, under cover in its original packaging.

Care should be taken when handling the product in line with current manual handling regulations.

Preparation

Visqueen Gas Barrier should be installed on a smooth continuous surface e.g. grouted beam and block floor, a compacted blinding layer e.g. 50mm thick sand blinding, or smooth concrete blinding. The substrate should be free from irregularities such as voids or protrusions.

The barrier can be cut with a sharp retractable safety knife or robust scissors.

Installation

Visqueen Gas Barrier should be loose laid on the substrate with the blue side up so as to avoid sunlight glare.

The barrier should be clean and dry at the time of jointing. It should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Foil Lap Tape. In demanding site conditions seal lap joints with Visqueen Ultimate GR Lap Tape.

Alternatively lap joints can be heat welded to achieve an effective seal. Welded lap joints can be less than 150mm provided the joint integrity is not compromised.

Airtight seals should be formed around all service entry points. Visqueen Preformed Top Hat Units should be used for sealing service entry pipes. The base of the top hat and the upstand should be bonded using Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Foil Lap Tape. The upstand should be secured with the supplied jubilee clip.

Forming an effective barrier to gases may give rise to complex three-dimensional detailing where, it is recommended Visqueen Preformed Units are used e.g. corners. Alternatively Visqueen Pro Detailing Strip can be used to seal awkward junctions.

If the barrier is punctured or perforated a patch of the same material should be lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Foil Lap Tape. Alternatively a patch can be formed using Visqueen Pro Detailing Strip and lapped at least 150mm beyond the extents of the puncture.

The barrier should be covered by a protective layer as soon as possible after installation to prevent damage e.g. from following trades. 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 puncturing the barrier. Where there is a high risk of potential damage, the barrier should be covered with Visqueen TreadGuard protection, screed, or other approved protection material before positioning the reinforcement.

Usable temperature range

It is recommended that Visqueen Gas Barrier and all associated system components should not be installed below 5°C.

Additional information

When used in accordance BS8485:2015 + A1:2019 a subfloor ventilation system or pressure relief maybe required
Where hydrocarbon or VOC contamination is present use Visqueen Ultimate VOC or HC Blok gas protection systems
To assist build sequencing, Visqueen GR DPC is available for gas protection through the wall constructions
For suspended beam and block floor detailing see GB-01
Visqueen Preformed Top Hat Units should be used at service pipe penetrations see GB-51
For internal and external corners Visqueen Ultimate Preformed Units should be used see PFU-553
To seal around steel columns use Visqueen Pro Detailing Strip see GB-52
For additional detailing information, contact Visqueen Technical Services +44 (0) 333 202 6800

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

Technical support: +44 (0) 333 202 6800

Date Published: 11/09/2020

Visqueen Gas Barrier

Property	Test method	Units	Compliance criteria	Result
Dimensions	EN 1848-2	m		2 x 50
Overall thickness including scrim mesh	EN 1849-2	mm		0.66
Effective thickness in between scrim mesh	EN 9863-1	mm		0.4
Mass	EN 1849-2	g/m²	-0%/+5%	400
Tensile strength - MD	EN 12311	N	MLV	350
Tensile strength - CD	EN 12311	N	MLV	350
Tensile elongation - MD	EN 12311	%	MLV	20
Tensile elongation - CD	EN 12311	%	MLV	21
Joint strength	EN 12317-2	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	℃	MDV	-40
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	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	7000
Water vapour transmission - permeability	EN 1931	g/m²/d	MDV	0.03
Visible defects	EN 1850 -2	-	Pass/Fail	Pass
Reaction to fire	EN 13501-1	Class	MDV	F
BS 8485:2015 + A1:2019 testing requirements				
Mass	EN 1849-2	g/m²	Average >370	400
Methane permeability	ISO 15105-1	mls/m²/d/atm	Pass/Fail	<0.15
Puncture CBR	BS EN ISO 12236	N	MDV	1114
Impact resistance	EN 12691	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
Resistance to static loading	EN 12730	kg	>MLV	20
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

Health and safety information

Refer to the Visqueen Gas Barrier material safety datasheet (MSDS).

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

Technical support: +44 (0) 333 202 6800

Date Published: 11/09/2020

Visqueen Gas Barrier

About Visqueen

The Visqueen name has long been recognised as one of the leading manufacturers of high quality advanced membrane technologies and design based solutions by specifiers, distributors, builders merchants and contractors throughout the UK and Europe.

For further guidance on the Visqueen services shown below, please refer to the relevant section of the Visqueen website (www.visqueen.com) or contact Visqueen Technical Services on +44 (0) 333 202 6800 or enquiries@visqueen.com

Complete Range, Complete Solution

Visqueen Technical Support

Visqueen combine an extensive product portfolio with industry leading levels of service and support which includes guidance over the phone, bespoke CAD drawings to help with complex detailing, electronic NBS specifications and access to a dedicated team of highly knowledgeable and experienced field based Technical Support Managers.

Visqueen Technical Support is available to all our customers including architects, specifiers, distributors, builders merchants, contractors and end users. All of our technical team have been awarded the industry recognised qualification Certificated Surveyor in Structural Waterproofing (CSSW).

Visqueen CPD Seminars

The Visqueen Continuing Professional Development (CPD) Seminars provide up-to-date information on changes within Building Regulations/Building Standards and nationally recognised industry guidance affecting damp proofing, water vapour control, hazardous ground gas protection and below ground structural waterproofing.

The one hour seminars have been produced for design specialists within the construction sector and are delivered by our team of Technical Support Managers.

Visqueen PI designs and special projects

From initial design to the completed project, Visqueen are with you every step of the way. Whether it be hazardous ground gas protection and/or below ground waterproofing protection employing barrier, structurally integral or drained systems, Visqueen can offer professional indemnity (PI) insurance for bespoke Visqueen design solutions.

Visqueen Technical Support Managers work with all stakeholders to provide cost effective Visqueen solutions offering complete peace of mind throughout the construction phase and beyond.

Visqueen Training Academy

Based at our manufacturing facility in Derbyshire, the Visqueen Training Academy is available to support Visqueen customers throughout the UK by providing a wide range of both theory and practical skills related training.

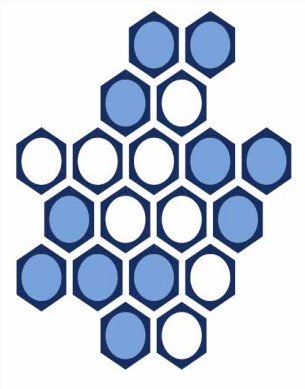
Courses include one day product awareness training for our distributors and builders merchants to help them in their day-to-day jobs, through to intensive three day courses giving detailed hands-on training in the practical skills required for safe and robust product installation.

Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
+44 (0) 333 202 6800 I enquiries@visqueen.com I www.visqueen.com

FiloSeal+HD Duct Seal

Duct sealing system FiloSeal+HD is an eginnered universal solution for sealing larger heavy cables and pipes in ducts, boreholes or transit frames.

Up to 2 bar Pressure Resistance
100Kg pulling Force on the cables when sealed
10xd at 45º, with 1 bar pressure bending test



Features

- Flexible, one component, adhesive and sealing compound in a cartridge - (310ml)
- Kits are complete with backing and mastic to fill an empty duct of the quoted kit size
- High levels of Gas and Water tightness
- Excellent adhesion, applicable to all common building materials
- Shows Fire resistance properties
- Resistant against Water, Alkaline, Chemical agents
- Resistant to termites (Mastotermes Darwiniensis) Northern Australian termites
- Resistant to Rats
- Resistant to Hydrogen Sulphide / Methane and many other Gases (NedLab)
- Non-corrosive
- Solvent-free
- Shock absorbing
- Non-toxic, neutral and almost odourless
- Also suitable for limiting the EX-zones during transitions (observe chemical resistance)
- Complies with 2011 NEC Articles 225.27, 230.8, 300.5(G), 300.7 (A) on Raceway Seals, and 501.15 (B)(2)
- Suitable for any shaped duct/borehole/opening
- WIMES Compliant (3.02 2013 6.4.3.2 b)
- Quick and easy installation
- A complete kit
- Seals all know materials, PVC & PE sheathed cables, PILC, (HD) PE pipes
- Engineering duct sealing solution
- Suitable for renovations, can be installed retrospectively
- Over 25 years of operational experience

More info

Download: FiloSeal+ disclaimer

View this product at: https://www.filoform.co.uk/filoseal-hd-re-enterable-duct-sealing

FiloSeal+HD Duct Seal

Products

Art.nr.	Product Name	Duct diameter min.-max. (mm)	Order unit
280010	FiloSeal+HD - 75mm > 110mm	Ø 110 max.	per piece
280020	FiloSeal+HD - 125mm > 160mm	Ø 160 max.	per piece
280030	FiloSeal+HD - 180mm	Ø 180 max.	per piece
280040	FiloSeal+HD - 200mm	Ø 200 max.	per piece
280050	FiloSeal+HD - 225mm	Ø 225 max.	per piece
280060	FiloSeal+HD - 250mm	Ø 250 max.	per piece

APPENDIX V
GAS VERIFICATION SHEET

ERGO 22-1214 SUNCROFT, WARKWORTH Gas Protection Validation Site Record

One record sheet to be completed per plot. To be completed by the ERGO Professional Inspecting

Site:	SUNCROFT	**Plot no:**	PLOT 2 GARAGE	**Inspection date/time:**	24/02/23
Inspection by:	K. FLANNIGAN	**Installers:**	DP BUILDERS LTD	**Photographed:**	✓/×

	Membrane Type	**Laps and joins**	**Membrane Condition (inc. underside)**	**Extent of coverage**
Complete ✓/×	VISQUEEN MEMBRANE	ADEQUATE	ADEQUATE	GOOD
Remarks inc. any repairs	MINOR REPAIRS, RECTIFIED.	**Please select:** [Taped] Hand welded Auto welded Other (please state)		

	Service Entries	**Damp Proof Course**	**Test Type**
Complete ✓/×	ADEQUATE	N/A	
Remarks inc. any repairs	**Pre-formed**: y /(n)		[Pick Test] / Air Lance

This Plot has [PASSED] / FAILED* inspection. (Any proposed remedial works will be noted in the "Remarks" column on this form).

An additional inspection visit IS / [IS NOT]* required for this Plot.

Inspection by: K. FLANNIGAN ..... Signe [redacted] .....

Gas Protection Validation Site Record

Plot No: 2

Inspection date/time:	10/10/22	Inspected by:	JM	Photographed:	✓/x Yes

	✓/x	Notes/recommendations
Membrane Type Correct	✓	Visqueen as required
Extent of Coverage Correct	✓	Full coverage and bridging of cavity
Underside of Membrane	✓	Swept clear no penetrating items
Slab / membrane condition	✓	Adequate no evidence of penetrations
Laps and joints	✓	Adequate. Photographed
Damp-proof course	✓	Adequate and tied in
Service entries	✓	Adequately sealed
Folded Membrane Joint Taped & inspected	✓	Joint correctly sealed and bnp tape present adequate lap

This Plot has **PASSED/FAILED*** inspection. (Any proposed remedial works will be noted in the "Remarks" column on this form).

An additional inspection visit IS/IS NOT* required for this Plot.

Inspection by: S Malby Signed: [redacted]

One record sheet to be completed for each plot – To be completed by ERGO Professional Inspecting.

Gas Protection Validation Site Record

One record sheet to be completed per plot. To be completed by the ERGO Professional Inspecting

Site:	Suncroft	**Plot no:**	Plot 1	**Inspection date/time:**	9/11/22
Inspection by:	JM	**Installers:**	DP	**Photographed:**	✓/x

	Membrane Type	Laps and joins	Membrane Condition (inc. underside)	Extent of coverage
Complete ✓/x	Correct	Adequate and sealed	Swept prior to laying	Full, Adequate
Remarks inc. any repairs	Minor pinpricks identified and completed under supervision	**Please select:** Taped / ~~Hand welded~~ / Auto welded / Other (please state)		

	Service Entries	Damp Proof Course	Test Type
Complete ✓/x	Adequately sealed	Correct	
Remarks inc. any repairs	**Pre-formed**: y / n		Pick Test /Air Lance

This Plot has **PASSED/FAILED*** inspection. (Any proposed remedial works will be noted in the "Remarks" column on this form).

An additional inspection visit IS/IS NOT* required for this Plot.

Inspection by: J Malley ..... Signed: [redacted] .....

Ergo Environmental Limited
Registered in England No: **11162116** Registered Office: 172-174 Albert Road, Jarrow, Tyne and Wear, Jarrow NE32 5JA

Gas Protection Validation Site Record

One record sheet to be completed per plot. To be completed by the ERGO Professional Inspecting

Site:	SUNCROFT WARKWORTH	**Plot no:**	1 & 2	**Inspection date/time:**	10/6/22 2:30
Inspection by:	JC	**Installers:**	DP Builders	**Photographed:**	✓/×

	Membrane Type	**Laps and joins**	**Membrane Condition (inc. underside)**	**Extent of coverage**
Complete ✓/×	VISQUEEN GAS	As required	✓	✓
Remarks inc. any repairs	externals only - preformed corner units	**Please select:** (Taped) Hand welded Auto welded Other (please state)	good	As required at this stage.

	Service Entries	**Damp Proof Course**	**Test Type**
Complete ✓/×	✓	X	✓
Remarks inc. any repairs	**Pre-formed:** (y) / n those complete at this stage are good	not yet complete externals only	(Pick Test) /Air Lance

This Plot has (PASSED)/FAILED* inspection. (Any proposed remedial works will be noted in the "Remarks" column on this form).

An additional inspection visit (IS)/IS NOT* required for this Plot.

Inspection by: J. CAMPBELL Signed: [redacted]

No further visit required following installation of internal areas.