

VERIFICATION REPORT

for land at

PLOTS 29-35 & 47-55

**HAMBLEWOOD, HEATH HOUSE LANE,
HEDGE END, HAMPSHIRE, SO30 0LE**

on behalf of

BARGATE HOMES

Report:	VERIFICATION REPORT
Site:	PLOTS 29-35 & 47-55, HAMBLEWOOD, HEATH HOUSE LANE, HEDGE END, HAMPSHIRE, SO30 0LE
Client:	BARGATE HOMES
Date:	24/04/2024
Reference:	GE20045/VR/PLOTS 29-35 & 47-55/APR24
Version:	1.0
Prepared by:	 FIONA GOODE BSc (Hons), MSc, FGS, MEnvSc, RSoBRA Senior Consultant Engineer
Reviewed by:	 LAURA LEGATE CGeol, CSci, BSc (Hons), MSc, FGS Environmental Director
Approved by:	 GAVIN ROBERTS CGeol, BEng(Hons), MSc, FGS Technical Director

Geo-Environmental Services Ltd
Unit 7, Danworth Farm, Cuckfield Road, Hurstpierpoint, West Sussex, BN6 9GL
+44(0) 1273 832972 www.gesl.net

[Environmental Consultants](#) | [Geotechnical Engineers](#) | [Site Investigations](#)

AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials	Reviewed by	Approved by
1.0	24/04/2024	First issue for Plots 29-35 & 47-55	FG	LL	GR

CONTENTS

1.0	INTRODUCTION	1
1.1	General	1
1.2	Objectives	1
1.3	Planning Permission	2
2.0	BACKGROUND	3
2.1	Proposed Site Use	3
2.2	Investigation and Assessment	3
2.3	Conceptual Site Model	4
2.4	Approach for Remediation, Monitoring and Validation	4
3.0	GROUND GAS	5
3.1	Ground Gas Assessment	5
3.2	Gas Protection Design Measures	5
3.3	Verification/ Independent Inspection	6
4.0	IMPORTED SOILS	8
5.0	DISCOVERY STRATEGY	9
6.0	VERIFICATION	10

FIGURES

FIGURE 1	Site Plan
FIGURE 2	Development Layout Plan

APPENDICES

APPENDIX A	Visual Inspection Records of Gas Membrane Installations
APPENDIX B	Construction Drawing (Gas Protection)
APPENDIX C	Juta GP1 Technical Specification and BBA Certificate
APPENDIX D	Gas Membrane Installer Qualification Certificates
APPENDIX E	Floor construction detail photos and email confirmation

1.0 INTRODUCTION

1.1 General

Following a Phase I and Phase II assessment of the site undertaken by Geo-Environmental Services Limited ('Geo-Environmental'), together with subsequent development of a Remediation Strategy and Verification Plan (RSVP), detailed within reports listed below, Geo-Environmental was instructed by Bargate Homes ('the Client') to prepare a Verification Report in relation to the installation of gas protection measures within the residential development for Plots 29-35 & 47-55, Heath House Lane, Hedge End, Hampshire, SO30 0LE.

Previous Reports:

- Ground Appraisal Report – GE17760/GAR/DEC18, December 2018
- Groundwater and Ground Gas Addendum Letter Report – GE17760/FG02/190312, March 2019
- Remediation Strategy and Verification Report – GE20045/RSVPv3.0/DEC21, December 2021

This report relates specifically to the installation and validation of remedial measures in relation to gas protection measures installed within Plots 29-35 and 47-55 only. At the time of reporting gas protection measures within other Plots across the site were not ready for final validation inspections and will therefore be validated and reported within a separate verification (or updated) report in due course.

Previous phases of validation works on site have already been undertaken and reported for the site under the following reports:

- GE20045/VR/BLOCKS A & D/AUG22, which presented the validation of gas protection measures installed within Blocks A & D only.
- GE20045/VR/BLOCK B & PLOTS 22-28, 83-85, 92-94/JAN23v2, which presented the validation of gas protection measures installed within Block B & Plots 22-28, 83-85, and 92-94 only.
- GE20045/VR/BLOCK C & PLOTS 20-21, 36-39, 74, 76, 86-91/APR23, which presented the validation of gas protection measures installed within Block C & Plots 20-21, 36-39, 74, 76, 86-91 only.
- GE20045/VR/PLOTS 70-73, 75, & 77-82/JUL23, which presented the validation of gas protection measures installed within Plots 70-73, 75 and 77-82 only.
- GE20045/VR/BLOCK F & PLOTS 40-46, 56-60 & 67-69/NOV23, which presented the validation of gas protection measures installed within Block F and Plots 40-46, 56-60, & 67-69 only.

This report sets out the works undertaken to date to provide independent verification of the risk mitigation measures incorporated into the development to protect the development and end users thereof with respect to ground gases. This report provides final validation for works undertaken and independent inspection in relation to Plots 29-35 and 47-55 only.

1.2 Objectives

A desk study and ground investigation undertaken by Geo-Environmental identified the presence of potential hazards and through a risk assessment process a series of pollutant linkages were identified which require action to mitigate or otherwise reduce the risk. The Remediation Strategy and Verification Plan (RSVP) sets out the proposed remedial works to be undertaken on the subject site to support its development for a proposed residential end use.

This Verification Report (VR) presents the details and findings of inspection visits undertaken, throughout the construction period, by Geo-Environmental in respect to Plots 29-35 and 47-55 in relation to gas risk in order to



demonstrate that the gas risk mitigation measures were implemented as set out in the RSVP, within these Plots only.

1.3 Planning Permission

It is understood that planning permission has been granted for the site by Eastleigh Borough Council under Planning Reference F/19/86829. It is understood that the following pre-commencement planning conditions have been attached to the application which relate to the remediation and validation of land contamination on the site.

Condition 12 –

Prior to the commencement of groundworks on site the following shall be submitted to and approved in writing by the LPA:

- a. a Report of Preliminary Investigation comprising a Desk Study, Conceptual Site Model, and Preliminary Risk Assessment documenting previous and existing land uses of the site and adjacent land in accordance with national guidance and as set out in Contaminated Land Report Nos. 11, CLR11, and BS10175:2011 Investigation of potentially contaminated sites - Code of Practice, and, unless otherwise agreed with the LPA,*
- b. a Report of a site investigation documenting the ground conditions of the site and incorporating chemical and gas analysis identified as appropriate by the Preliminary Investigation and in accordance with BS10175:2011, and BS 8576:2013 and unless otherwise agreed with the LPA.*
- c. if required, a detailed site-specific scheme for remedial works and measures to be undertaken to avoid the risk from contaminants and/or gases when the site is developed and proposals for future maintenance and monitoring.*

Such a scheme (if required under c) shall include nomination of a competent person to oversee the implementation of the works. Reason: To prevent harm to human health

Condition 13 -

The development hereby permitted shall not be occupied / brought into use until there has been submitted to the LPA verification by the competent person approved under the provisions of condition 12(c) that any remediation scheme required and approved under the provisions of condition 12(c) has been implemented fully in accordance with the approved details (unless varied with the written permission of the LPA in advance of implementation).

Unless agreed in writing with the LPA such verification shall comply with the guidance contained in CLR11 and EA Guidance for the Safe Development of Housing on Land Affected by Contamination - R&D Publication 66: 2008. Typically, such a report would comprise:

- a. A description of the site and its background, and summary of relevant site information,*
- b. a description of the remediation objectives and remedial works carried out.*
- c. verification data, including - data (sample locations/analytical results, as built drawings of the implemented scheme, photographs of the remediation works in progress, etc.*
- d. Certificates demonstrating that imported and/or material left in situ is free from contamination, gas/vapour membranes have been installed correctly.*

Thereafter the scheme shall be monitored and maintained in accordance with the scheme approved under condition 12(c), if required.

2.0 BACKGROUND

This Verification Report has been produced in order to demonstrate that the works required and presented within the Remediation Strategy and Verification Plan (RSVP) have been carried out. The RSVP for the site was developed following several phases of investigation works for the site, including Phase I Desktop Study and Phase II intrusive investigation works undertaken and reported within the Ground Appraisal Report by Geo-Environmental (GE17760/GAR/DEC18, December 2018) and Groundwater and Ground Gas Addendum Letter Report by Geo-Environmental (GE17760/FG02/190312, March 2019). Whilst a summary of these reports is presented below, reference should be made to the full reports for further details.

2.1 Proposed Site Use

It is understood that the existing farmhouse and associated former farm buildings have been demolished, with the site then being developed with a new access onto Heath House Lane, and the erection of 123No. dwellings together with internal roads, pumping station, landscaping and drainage provision.

2.2 Investigation and Assessment

A summary of the key findings of previous investigations and reports is presented below:

- At the time of the desk study and site investigation works (November 2018), the site comprised an irregularly shaped parcel of land occupied by a residential care home within the north-western corner of the site, a group of farm buildings in the north of the site with open fields for livestock across the remainder of the site.
- The ground conditions encountered during the intrusive investigation comprised a mantle of Topsoil or Made Ground, overlying the London Clay Formation with the exception of TP1 which comprised a mantle of Topsoil overlying the Portsmouth Sand Member.
- Made Ground was encountered within TP6, WS2, WS3 and WS5 to depths of between 0.30m and 0.80m bgl and comprised orange and brown slightly sandy clay with occasional brick fragments and ceramics; brown sandy clayey fine to medium gravel with brick and flint; and brown gravelly clay with brick, flint and ceramics. WS2 was located within the farmyard area amongst the existing farm buildings and WS5 was sited on the slightly raised track which ran centrally through the site towards the southern boundary.
- The Topsoil or Made Ground were underlain by the London Clay Formation, with the exception of TP1, which was found to comprise sandy clay, sandy gravelly clay, silty clay and clay. The strength of the clay soils varied both with location and depth but typically was described as soft to firm at shallow depth, becoming firm from around 1.00-1.50m bgl and firm to stiff at depth. The Portsmouth Sand Member was found to underlie the Topsoil within TP1 and comprised fine sand which was tentatively assessed as 'dense'.
- Groundwater was encountered within WS1 and WS5 during the investigation works at depths of 1.30m bgl and 4.20m bgl respectively. In addition, minor water seepages were observed within trial pits TP1, TP5 and TP7. It is considered that this was probably the release of perched water within more granular lenses of the London Clay Formation.
- Groundwater monitoring wells were installed within boreholes, WS2, WS5, and WS6. Groundwater was encountered within all of the monitoring wells during the return monitoring visits undertaken and was found to be present between depths of 1.60m bgl and at surface.
- Due to the depths of the groundwater encountered, the variations in depth and the underlying ground conditions these waters are considered to be perched water trapped within clay layers beneath the site and therefore discontinuous.
- There were limitations to the investigation in that a buffer of at least 15m was applied to the southern boundary due to the presence of Ancient Woodland beyond the boundary and possible associated root protection zone encroaching onto the site; and long grass in the field on the western portion of the site which was understood to comprise habitat for reptiles and so required an Ecologist to be present to direct

and oversee strimming of access routes to working areas at each exploratory hole within this portion of the site.

- The exploratory holes were located to provide general coverage of the site in line with the proposed development. Samples were selected to provide a good coverage of the site and to specifically target shallow soils that are likely to come into contact with identified receptors. Analysis was undertaken on soil samples collected from these exploratory holes.
- In the first instance the results of the sample analysis were compared to the respective Tier 1 screening criteria for the proposed residential end use, with plant update. All of the results were noted to be below the respective assessment criteria, therefore further assessment was not considered necessary. In addition, no asbestos was detected in any of the samples analysed.
- Three standpipes were installed within boreholes WS2, WS5 and WS6, and ground gas monitoring was undertaken to assess the potential risk posed to end users of the proposed residential development. These locations were selected to provide general coverage of the site, and to target the identified adjacent registered former landfill. Ground gas monitoring was undertaken on six occasions.
- The spot monitoring undertaken detected methane at concentrations in the range of 0% to 0.9%, carbon dioxide at concentrations in the range of 0% to 10.1% and oxygen in the range 0% to 20.9%. VOCs were detected up to 1.5ppm and atmospheric pressure was recorded between 999mb and 1024mb during the visits undertaken. Negligible borehole flows were detected with the monitoring wells, with a maximum positive flow rate of 3.4l/hr being detected within WS05 on one monitoring occasion.
- Due to the presence of water at ground surface in each of the wells on some monitoring occasions it was not always possible to monitor for ground gas. The wells were purged of water but had fully recharged before any gas monitoring could be undertaken.
- The spot monitoring undertaken by Geo-Environmental to date has indicated the site's gassing regime, based on both hazardous gas flow and limiting concentrations, to be Characteristic Situation 2 (BS and CIRIA), Amber 1 (NHBC) for which gas protection measures would be required.

2.3 Conceptual Site Model

The conceptual site model (CSM) developed as part of the risk assessment identified particular hazards, or potential hazards which were considered to require intervention (remediation) to mitigate the risk of harm.

2.4 Approach for Remediation, Monitoring and Validation

Remediation works were proposed to break the pathways of identified sources of contamination to receptors. The aim of the remediation was not necessarily to remove all contamination from the site but to provide betterment and to reduce the identified risk to an acceptable level with respect to relevant receptors, e.g. human health, the built environment and controlled waters.



3.0 GROUND GAS

3.1 Ground Gas Assessment

A ground gas assessment was undertaken as part of the Phase II intrusive investigation and as part of the Groundwater and Ground Gas Addendum Letter Report, undertaken by Geo-Environmental (GE17760/FG02/190312, March 2019). Three ground gas monitoring standpipes (WS2, WS5 and WS6) were installed on site to depths of up to 5.0m bgl. These locations were selected to provide general coverage of the site, and to target the identified adjacent registered former landfill. Ground gas monitoring was undertaken on six occasions, in line with current best practice guidance for a residential end use, and where possible targeted periods of falling atmospheric pressure in accordance with best practice.

The spot monitoring undertaken detected methane at concentrations in the range of 0% to 0.9%, carbon dioxide at concentrations in the range of 0% to 10.1% and oxygen in the range 0% to 20.9%. VOCs were detected up to 1.5ppm and atmospheric pressure was recorded between 999mb and 1024mb during the visits undertaken. Negligible borehole flows were detected with all the monitoring wells, with a maximum positive flow rate of 3.4l/hr being detected within WS5 on one monitoring occasion.

A Tier 1 Ground Gas Risk Assessment (GGRA) incorporating the results of the desk study and ground investigation was undertaken. This risk assessment concluded that based on the low risk sources of bulk permanent gases, diffusive gas flow conditions and the frequency of the exceedances of the limiting concentrations for carbon dioxide, that the entire site is classified as NHBC Amber 1, for which gas protection measures would be required.

3.2 Gas Protection Design Measures

The following gas protection measures were considered to be required to protect the development and end users thereof:

- Suspended ground floor slabs;
- Passively ventilated sub-floor void via air bricks (minimum 150mm clear void height across the footprint) with sufficient ventilation to allow at least one complete volume change in any given 24hr period. Air bricks will need to be positioned above external ground level in the outer skin such that they have a clear and uninterrupted flow of air across them. This has a direct bearing on construction and external levels where level thresholds are required;
- Minimum penetration of the slab by services and sealing of all penetrations and joints using 'top hats' or bespoke/site formed top hat seals;
- Installation of a gas resistant membrane (suitable for protection against carbon dioxide) laid across the floor with all joints and service penetrations sealed to form a single integral membrane with taped or welded joints. All joints should comprise a minimum 150mm overlap. It is recommended that membrane installation is undertaken by a suitability competent (e.g. NVQ qualified) installer;
- Use of an appropriate gas resistant DPC across the cavity with lap on the inner skin wall to facilitate joining to the floor membrane.
- Inspection and verification of installed measures.

In accordance with NHBC policy, recycled plastics were not acceptable as part of the gas protection measures. Use of recycled plastics would result in plots being failed during validation and at CML stage.

If any of the proposed houses have an integral garage, or a detached garage which could be converted for 'non-garage' use, e.g. residential, home gym, home office or the like, the gas protection measures would also be required to be installed in the garage.



3.3 Verification/ Independent Inspection

Gas protection measures on site have been installed by Dance-Reeves Limited. Copies of the installers NVQ qualifications are presented within Appendix D. Independent verification of gas protection measures at various stages of the development with respect to Plots 29-35 & 47-55 was undertaken by Geo-Environmental on behalf of Bargate Homes, and included several inspection visits undertaken between June 2023 and April 2024, details of which are presented below:

- 20th April 2023 (Plot 55 perimeter);
- 8th June 2023 (Plots 33-35 perimeter);
- 9th August 2023 (Plots 50-51 floor construction);
- 11th September 2023 (Plots 50-51 perimeter and Plots 55-57 whole floor);
- 21st September 2023 (Plots 52-54 perimeter);
- 22nd November 2023 (Plots 31-32 perimeter, and 35 whole floor, Plots 47-49 floor construction and Plots 29-30 airbricks to subfloor);
- 29th November 2023 (Plots 29-30 and 47-49 perimeter and Plots 33-34 whole floor);
- 18th January 2024 (Plots 50-51 whole floor);
- 22nd January 2024 (Plots 52-54 whole floor);
- 4th April 2024 (Plots 31-32 whole floor);
- 11th April 2024 (Plots 29 and 47-49 whole floor area);
- 19th April 2024 (Plot 30 whole floor area);

Plots 47-49 and 52-54 comprised terraced houses, 31-32, 33-34 and 50-51 comprised semi-detached houses, and Plots 29, 30, 35 and 55 comprised detached houses. Floor construction within these houses comprised a suspended floor slab with sub floor void using 65mm x 215mm cranked sub-floor ventilators venting via air bricks positioned above external ground levels. The membrane was installed around the perimeter of the blocks so as to lap directly over external walls to ensure the cavity was sealed, laid beneath the DPC. A subsequent membrane was then installed above the void across the entire floor area, and sealed to the perimeter membrane, so as to ensure a continuous seal. Celotex Rigid insulation (or similar) was to be installed directly on top of the gas resistant membrane with floor screed above.

At the time of some of the inspection visits construction had advanced to such a stage that it was not possible for the Engineer from Geo-Environmental to inspect the sub floor voids of Plots 31-35 and 52-55. However, Geo-Environmental were able to inspect the sub floor voids of Plots 29-30, 47-49 and 50-51 during validation visits undertaken. Inspection records showing photographs of these sub floor voids are presented in Appendix E. Bargate Homes have also confirmed in writing (within an email) that all plots across the site were constructed with a suitable sub-floor void, presented within Appendix E. During the validation inspection visits undertaken it was possible for Geo-Environmental to inspect the telescopic venting and air bricks which had been installed. All inspected vents were noted to be suitably connected, above ground level and not obstructed at the time of the inspection visits.

The gas membranes were installed within Plots 29-35 & 47-55 by specialist membrane installers from Dance-Reeves Limited. The membranes utilised were black Juta GP1 gas resistant membranes. All membrane joints were heat welded with at least a 100mm overlap. Corner details and threshold details were sealed using heat welded butyl-based detailing strips. Site-formed service seals were used to seal services and were formed of butyl-based detail strip/tape cut to size. Where necessary any damage or defects were sealed using butyl-based detail strip/tape cut to size, details of which are provided below and documented in Appendix A.

The gas resistant products installed across all plots comprised:

- Black Juta GP1 gas resistant membrane;
- Pro Detailing Strip;

- Juta GP Tape (extruded butyl tape).

The gas mitigation measures were inspected by Geo-Environmental on several occasions to observe and record that the measures installed complied with the requirements as set out within the RSVP. Visual inspection record sheets in line with the verification pro forma as set out in CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gases', of the gas protection measures installed are enclosed in Appendix A. The sub-structure detail drawing, ref: 153-SB-100-1st, dated 01/12/2021 is presented in Appendix B and the technical specification and BBA certificate for the gas membrane utilised (GP1) is presented in Appendix C.

4.0 IMPORTED SOILS

It is understood, following email confirmation from Bargate Homes, that it was not necessary to import soils to site to complete areas of soft landscaping associated within Plots 29-35 & 47-55. These areas of soft landscaping will be completed with site won Topsoil and subsoil which have been previously tested as part of the Ground Appraisal Report (ref GE17760/GAR/DEC18) for the site and deemed suitable for use.

5.0 DISCOVERY STRATEGY

A discovery strategy remains in place throughout the development works on this site. Geo-Environmental has not been made aware of any discoveries having been made to date and thus the strategy, as set out in the RSVP did not require enacting (to the best of our knowledge). However, the strategy remains in place for the remainder of the development works.

6.0 VERIFICATION

In accordance with the Client's instruction, Geo-Environmental undertook routine and independent inspection during key stages of the construction process. The risk mitigation measures in relation to gas protection remedial measures for Plots 29-35 & 47-55, have been inspected and were considered to comply with the requirements of the design and Remediation Strategy and Verification Plan at the point of inspection, or defects otherwise noted and subsequently rectified. Further validation works for gas protection measures within other Plots across the site have yet to be completed at the time of writing and will therefore be reported under separate cover.

Please be aware that the independent inspection and validation of the gas protection measures installed presented within this report relates to the works undertaken up to the point of inspection and in relation to the areas inspected. Geo-Environmental accepts no responsibility or liability for any works following the inspection that may have resulted in subsequent damage to the gas protection measures and membranes installed due to any failure to protect the membrane prior to or after screeding works on site.

The report relates solely to the validation of the ground gas mitigation measures installed within Plots 29-35 & 47-55. Validation with respect to gas protection measures within other Plots across the site will be presented under separate cover (or an updated report) in due course.

This report remains the property of Geo-Environmental and the Client has no rights to, or reliance upon this document or supporting documents until such time as payment has been received in full for all invoices for works undertaken in connection with this report.



FIGURES





Project:	Hamblewood, Heath House Lane, Hedge End SO30 0LE			Title	Site Location Plan	
Client:	Bargate Homes			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		
Ref No:	GE20045	Revision:	1.0			
Drawn:	FG	Date:	10/08/2021			
Figure:	1	Scale:	Not To Scale			



1. SITE PLAN: Substantive Development with all main roads etc. No
 2. SITE PLAN: Substantive Development with all main roads etc. No
 3. SITE PLAN: Substantive Development with all main roads etc. No
 4. SITE PLAN: Substantive Development with all main roads etc. No

BARGATE **aap**
 aap is a subsidiary of Bargate Homes Ltd.
 Hedge End, Hampshire
 www.bargatehomes.co.uk
 Countryside Plan

Scale: 1:500 @ A3 Date: 10/08/2021 No: 1
 Drawn by: FG Checked by: FG
 Drawn by: FG Checked by: FG
 Drawn by: FG Checked by: FG

Geo-Environmental Services Ltd
 Unit 7 Danworth Farm, Cuckfield Road
 Hurstpierpoint, West Sussex BN6 9GL
 +44(0)1273 832972 www.gesl.net

Project:	Hamblewood, Heath House Lane, Hedge End SO30 0LE			Title	Proposed Development Plan	
Client:	Bargate Homes			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net	 Geo-Environmental	
Ref No:	GE20045	Revision:	1			
Drawn:	FG	Date:	10/08/2021			
Figure:	2	Scale:	Not To Scale			



APPENDIX A

Visual Inspection Records





Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	20/04/2023, 11:05
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Sunny, breezy, dry
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached and semi-detached houses
Plot No.	Plots 55-57 & 59-60 perimeter
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Generally good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition
Jointing tape product	Heat sealed joins and butyl detailing strip
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed, corners finished with butyl detailing strip
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	All well spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

18 records

Photograph	Photograph Title
	Plot 55 overview
	Plot 55 airbricks



Plot 55 corner



Plot 55 airbrick connection

 A close-up photograph of a gas service pipe on a roof. The pipe is orange and has a red cap. It is surrounded by a white plastic bag and a brick. The roof is made of concrete and has some black waterproofing material.	Plot 55 service
 A close-up photograph of airbricks on a roof. The airbricks are red and are placed on a concrete roof. There is a pile of dirt and some bricks in the foreground.	Plot 56 airbricks
 A wide-angle photograph of Plot 56. The plot is a large, flat area with a concrete floor. There are some trees and a fence in the background. The plot is surrounded by a brick wall.	Plot 56 overview



Plot 56 services



Plot 57 overview



Plot 57 membrane join

		Plot 57 airbricks
		Plot 59 overview
		Plot 59 corner



Plot 59-60 party wall



Plot 59



Plot 60 overview

	Plot 60 services
	Plot 60 airbricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	08/06/2023, 12:33
Site Engineer	

No users

Weather at time of inspection	Sunny, warm, still
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi detached, detached houses and coach house
Plot No.	Plots 33-35 perimeter & Plot 43 whole floor
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Generally good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	All joins heat sealed, butyl detailing strip used on corners and services
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All joins heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

17 records

Photograph	Photograph Title



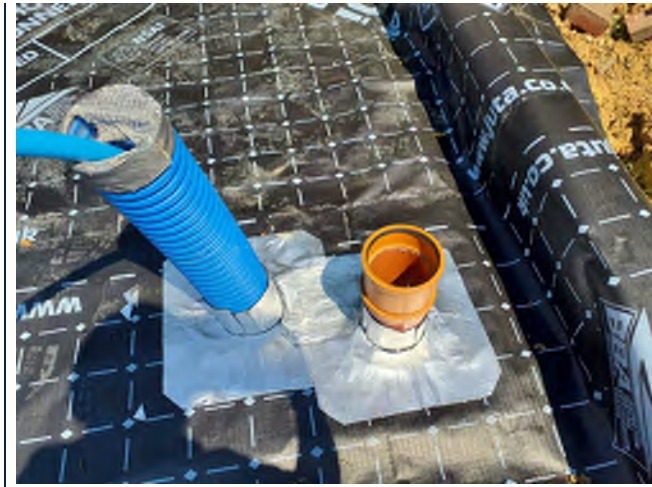
Plot 43 over view



Plot 43 corner



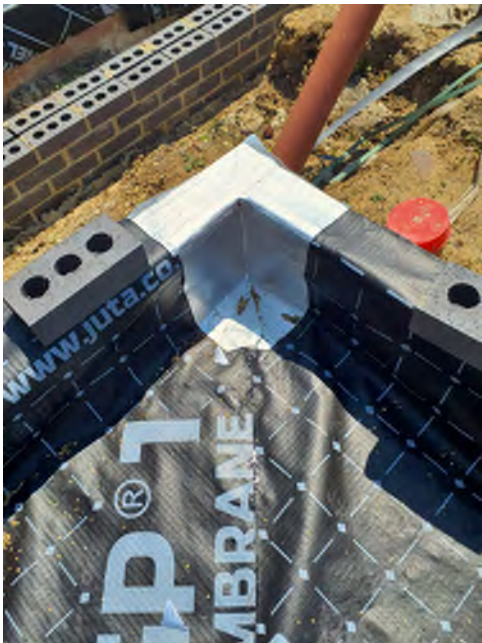
Plot 43 membrane join



Plot 43 services



Plot 33 overview



Plot 33 corner



Plot 33 services



Plot 33 & 34 party wall



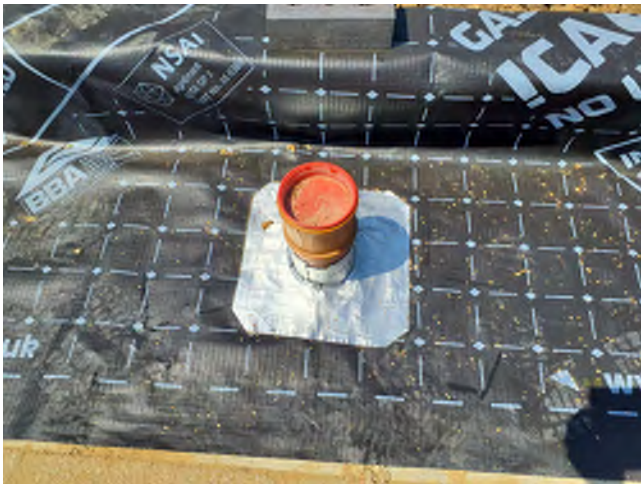
Plot 34 overview



Plot 34 airbrick



Plot 34 corners



Plot 34 service



Plot 34 airbricks



Plot 35 overview



Plot 35 airbricks

	Plot 35 corner
	Plot 35 services

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	fiona.goode@gesl.net
Date	11/09/2023, 12:34
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Dry, warm, gentle breeze
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi detached houses
Plot No.	50 - 51
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Clean. Recently installed beam and block with top skim
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Freshly laid. Very good condition.
Jointing tape product	Butyl heat activated foiled backed
1.5 Lapping design	Welded overlaps
1.6 Laps, welds and joints seals	Overlaps, welds and seals in good condition. No defects identified.
1.7 Service seals	Bespoke, site formed

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

8 records

Photograph	Photograph Title



Perimeter membrane in place



Bespoke service seals and corner detailing



Front door thresholds and party wall strip



Party Wall strip, service seals and rear thresholds

		Corner weld and wall step detailing
		BBA certification
		Weld line



Air brick and telescopic duct

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	fiona.goode@gesl.net
Date	11/09/2023, 13:12
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Warm and dry
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached house
Plot No.	55
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Freshly laid
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Very good condition
Jointing tape product	Butyl heat activated
1.5 Lapping design	Welded overlaps
1.6 Laps, welds and joints seals	Welded overlaps and heat sealed butyl strips/patches
1.7 Service seals	Bespoke

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

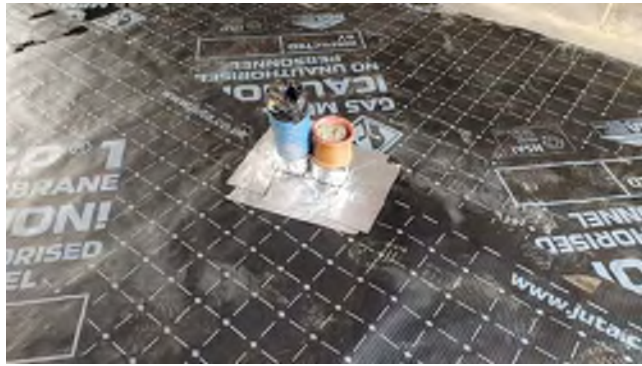
Photographs

11 records

Photograph	Photograph Title



Plot 55 Western end (kitchen?)



Plot 55 bespoke service seal



Plot 55 membrane weld



Plot 55 gas pipe seal



Plot 55 membrane welds



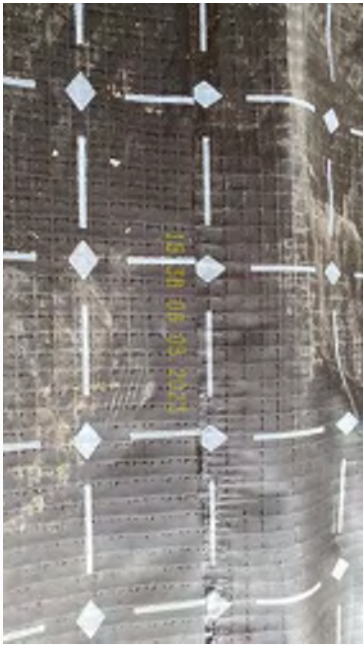
Plot 55 Eastern room



Plot 55 internal threshold



Plot 55 service seals

		Plot 55 membrane manufacture timestamp
		Plot 55 gas entry sealed to membrane
		Plot 55 membrane BBA stamp

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	21/09/2023, 14:16
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Cloudy, breezy, dry
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Terraced houses
Plot No.	Plots 52-54 perimeter
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Generally good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some mortar
Jointing tape product	Heat sealed joints and butyl detailing strip used on corners and services
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip and well sealed

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Well spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

12 records

Photograph	Photograph Title
	Plot 52 corner
	Plot 52 door threshold



Plot 52 services



Plot 52 airbricks



Plot 53 threshold



Plot 53 corner



Plot 53 airbrick



Plot 53-54 cavity



Plot 54 corner



Plot 54 services



Plot 54 airbrick



Plot 54 airbricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/11/2023, 09:39
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi detached houses
Plot No.	Plots 31-32 perimeter
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition
Jointing tape product	Heat sealed joints and butyl detailing strip used to seal services and corners
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Evenly spaced air bricks connected to telescopic vent connectors
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

9 records

Photograph	Photograph Title
 A wide-angle photograph showing the layout of Plot 32. A large rectangular area is covered with a light-colored, textured material, possibly sand or gravel, with white lines marking out sections. A stack of grey bricks sits on a pallet in the center. In the background, there are trees and a fence.	Plot 32 overview
 A close-up photograph of a corner detail on Plot 32. It shows a black, textured material (likely a gas protection membrane) with white lines. A red bucket and a blue bucket are visible, along with some white plastic sheeting and a small blue container.	Plot 32 corner detail
 A close-up photograph of a service point on Plot 32. It shows a red bucket and a blue bucket, with a white plastic sheeting covering the area. The black textured material is visible in the background.	Plot 32 service



Plot 32 air vent



Plots 31-32 party wall



Plot 31 overview

	Plot 31 corner
	Plot 31 services
	Plot 31 air vent

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	fiona.goode@gesl.net
Date	22/11/2023, 10:49
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached house
Plot No.	Plot 35
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition
Joining tape product	Heat sealed joints and butyl detailing strip used on services
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All joints heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Evenly spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

5 records

Photograph	Photograph Title
 A photograph showing an overview of the interior of a building under construction. The floor is covered with a dark, patterned gas protection membrane. A wooden plank is leaning against the wall on the left. The walls are made of light-colored concrete blocks. An opening in the wall at the end of the room shows the exterior ground.	Plot 35 overview
 A close-up photograph of the perimeter joint where the gas protection membrane meets the wall. The membrane is dark and has a grid pattern. The wall is made of light-colored concrete blocks. The joint is sealed with a yellowish material.	Plot 35 perimeter join

	Plot 35 service seals
	Plot 35 insulation on part of membrane
	Plot 35 airbricks

5. PASS/FAIL
The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	29/11/2023, 10:22
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Cloudy, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached houses
Plot No.	Plots 29-30 perimeter
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Generally good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition
Joining tape product	Heat sealed joints and butyl detailing strip used to seal services and corners
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip, all well sealed

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

7 records

Photograph	Photograph Title



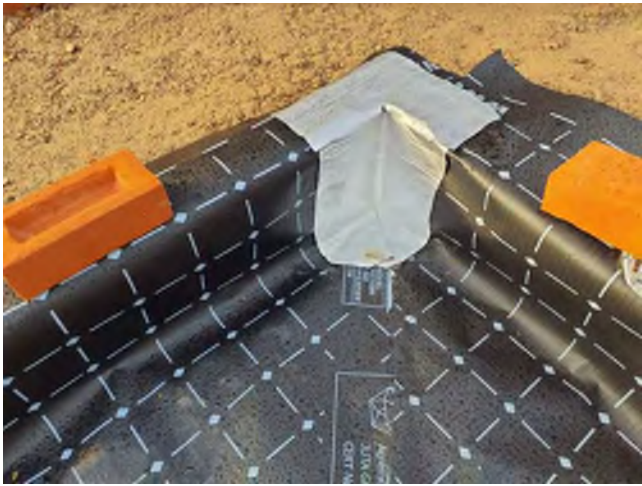
Plot 30 overview



Plot 30 corner



Plot 30 threshold

	Plot 30 service
	Plot 29 overview
	Plot 29 corner



Plot 29 service

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	29/11/2023, 10:30
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Cloudy, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi detached houses
Plot No.	Plots 33-34
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	Heat sealed joints and butyl detailing strip used to seal services and perimeter membrane
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip and well sealed

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Well spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

8 records

Photograph	Photograph Title
 A wide-angle photograph of a room under renovation. The floor is covered with a dark, patterned protective sheet. Several orange and white safety cones are placed on the floor. The walls are made of light-colored concrete blocks. A doorway is visible in the background.	Plot 34 overview
 A close-up photograph showing the perimeter seal of a room. A white, flexible sealant is applied along the base of a concrete block wall. The floor is covered with a dark, patterned protective sheet.	Plot 34 perimeter seal



Plot 34 membrane join



Plot 34 service seals



Plot 33 overview



Plot 33 perimeter join



Plot 33 gas pipe seal



Plot 33 airbricks

5. PASS/FAIL

The gas protection measures
inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	29/11/2023, 10:39
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Cloudy, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Terraced houses
Plot No.	Plots 47-49 perimeter
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Generally good condition
1.2 Gas membrane type	Juta GP1 gas resistant membrane
1.3 Gas membrane condition	Generally good condition
Joining tape product	Heat sealed joints and butyl detailing strip used to seal services and corners
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Evenly spaced, connected to telescopic connectors and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

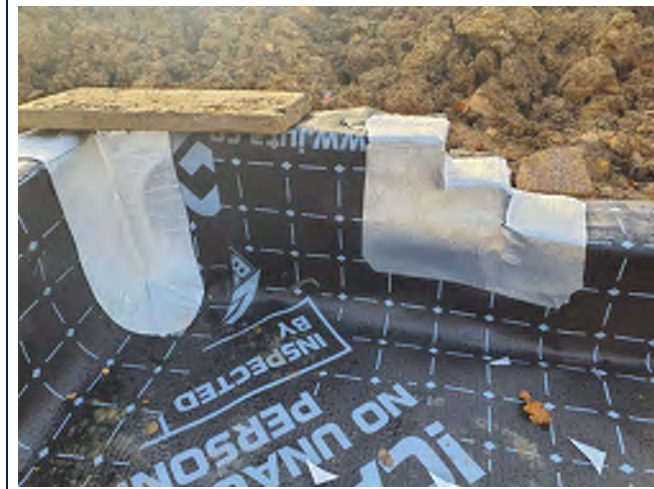
Photographs

12 records

Photograph	Photograph Title
 A wide-angle photograph showing a construction site for a new building. In the foreground, there is a large, flat, light-colored area, possibly a foundation or a prepared ground surface. To the left, there is a brick wall. In the background, there are other buildings, some with scaffolding, and a large excavator with 'VIKING' written on its side. The ground is uneven and appears to be under construction.	Plot 47 overview
 A close-up photograph of a brick wall. A red brick is being laid into a cavity, and a black plastic air brick is being inserted into the gap. The brick is partially covered by a black plastic sheet. The surrounding area is sandy and appears to be under construction.	Plot 47 air brick



Plot 47 services



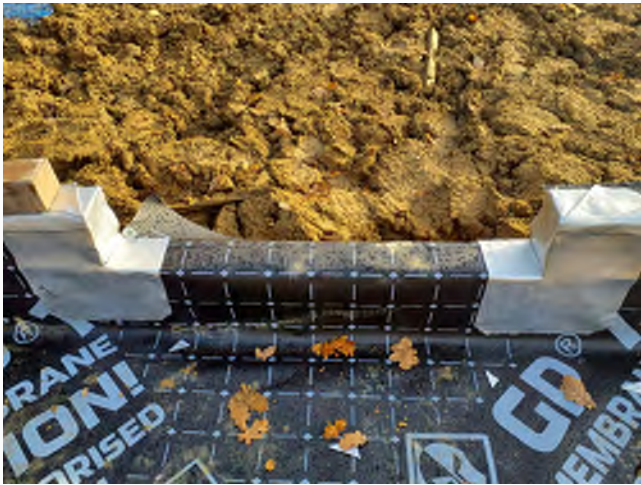
Plot 47 corner detail



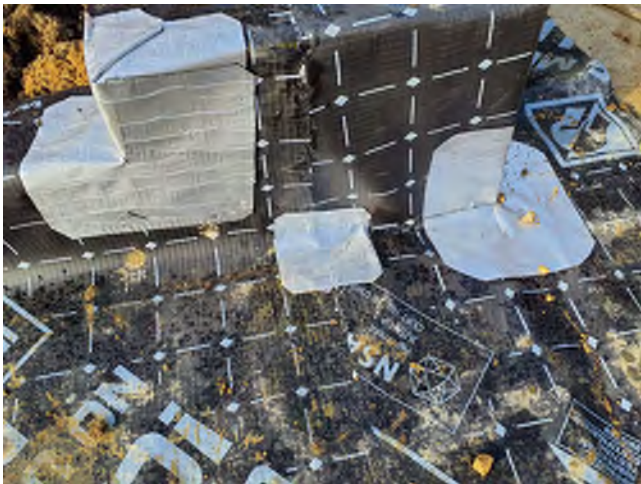
Plots 47-48 party wall



Plot 48 overview



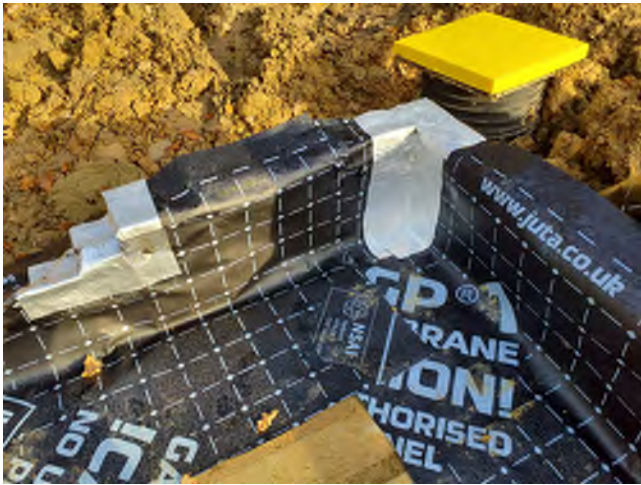
Plot 48 threshold



Plot 48 patch repair



Plot 49 overview



Plot 49 corner



Plot 49 airbricks



Plots 47-49 overview

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	18/01/2024, 12:54
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Cold, dry and sunny
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	House
Plot No.	51
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Not seen
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Good
Joining tape product	Self adhesive butyl heat activated
1.5 Lapping design	Under DPC and 100m laps
1.6 Laps, welds and joints seals	Welded
1.7 Service seals	Bespoke

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	Photograph Title



Reat threshold



Service seals



Long patch to perimeter lap

	Welded lap
	Front threshold
	Air vent

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	fiona.goode@gesl.net
Date	18/01/2024, 12:34
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Cold, dry and sunny
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Housing
Plot No.	50
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Not seen
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Good
Joining tape product	Self adhesive butyl heat activated
1.5 Lapping design	Under DPC and 100-15mm laps
1.6 Laps, welds and joints seals	All welded
1.7 Service seals	Bespoke with butyl tape

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

7 records

Photograph	Photograph Title



Plot50



Threshold



Service seals



Patch repairs

		Welded lap joint
		Front threshold
		Air vent

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/01/2024, 13:42
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Breezy (storm overnight)
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Housing
Plot No.	52
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Not seen
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Good
Joining tape product	Welded and heat sealed butyl tape
1.5 Lapping design	Welded laps
1.6 Laps, welds and joints seals	Welded and heat sealed butyl for penetrations and repairs
1.7 Service seals	Bespoke

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	Photograph Title



Front threshold



Services seals and patch repairs



Welded joint and service seal

	Air brick
	Air bricks at rea
	Side Air bricks

5. PASS/FAIL
The gas protection measures
inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/01/2024, 13:36
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Breezy (storm overnight)
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Housing
Plot No.	53
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Not seen
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Good
Joining tape product	Welded with butyl tape for bespoke seals and patching
1.5 Lapping design	Welded laps
1.6 Laps, welds and joints seals	Welded and heat sealed butyl. Good condition
1.7 Service seals	Bespoke

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	Photograph Title



Front threshold



Welded lap

	Bespoke service seals
	Service seals and patch repairs
	Rear threshold



External air brick

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/01/2024, 13:31
Site Engineer	
 Gavin Roberts	gavin.roberts@gesl.net
Weather at time of inspection	Breezy. Storm overnight.
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Housing
Plot No.	54
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☒ Membrane ☐ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Not seen
1.2 Gas membrane type	Juta GP1
1.3 Gas membrane condition	Good
Jointing tape product	Welded and heat sealed self adhesive butyl tape
1.5 Lapping design	Welded laps
1.6 Laps, welds and joints seals	Good
1.7 Service seals	Bespoke

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	Photograph Title

		Front threshold
		Perimeter joint
		Internal doorway
		Rear threshold

	Services seals
	Patch repairs

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	04/04/2024, 10:48
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry, slight breeze
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi-detached houses
Plot No.	Plots 31-32
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition, some signs of foot traffic
Jointing tape product	All joins heat sealed joins and butyl detailing strip used to seal services and membrane to existing perimeter membrane
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Evenly spaced airbricks and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

9 records

Photograph	Photograph Title
 A photograph showing an overview of a flat roof area. The roof is covered with a dark, textured membrane. There are several orange safety cones placed on the roof. In the background, there are brick walls and a doorway. The membrane has some white markings, including "CAUTION!" and "NO UNAUTHORISED PERSONNEL".	Plot 31 overview
 A close-up photograph of a membrane joint. The joint is a vertical seam where two pieces of membrane meet. The membrane is dark and has white dashed lines and the text "www.juta.co.uk" printed on it. The joint appears to be sealed with a dark material.	Plot 31 membrane join

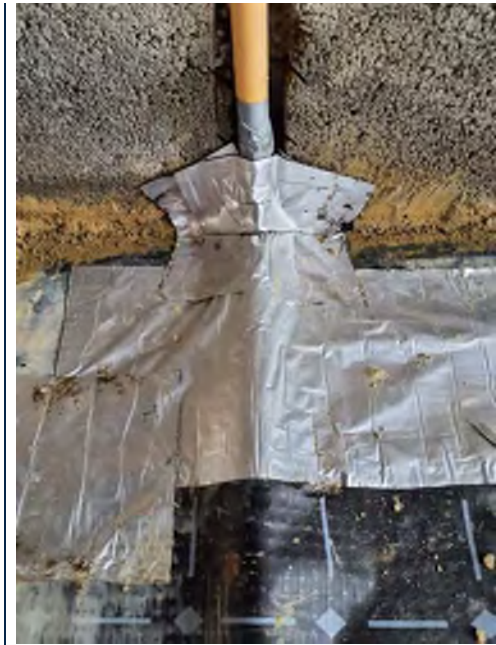
	Plot 31 service seals
	Plot 31 air bricks
	Plot 32 overview



Plot 32 edge detail



Plot 32 service



Plot 32 service



Plot 32 air bricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	11/04/2024, 14:25
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Dry, overcast
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached and terraced houses
Plot No.	Plot 29 and 47-49
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	All heat sealed joins and butyl detailing strip used to seal services and edges.
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All joins heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Airbricks are evenly spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

16 records

Photograph	Photograph Title
	Plot 29 overview
	Plot 29 overview

	Plot 29 edge detail
	Plot 29 service



Plot 29 membrane join



Plot 29 service



Plot 29 airbricks



Plot 49 overview



Plot 49 services



Plot 49 membrane join



Plot 49 airbricks



Plot 48 overview



Plot 48 edge detail and service



Plot 47 overview



Plot 47 services



Plot 47 airbricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	19/04/2024, 09:21
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry, breezy
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached house
Plot No.	Plot 30
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	Heat sealed joins and butyl detailing strip
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All joins heat sealed and well sealed
1.7 Service seals	Site made service seals with butyl detailing strip

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Airbricks evenly spaced and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

4. PHOTOGRAPHS

Photographs

6 records

Photograph	Photograph Title
	Plot 30 overview
	Plot 30 overview
	Plot 30 services



Plot 30 edge detail



Plot 30 membrane joint



Plot 30 airbricks

5. PASS/FAIL

The gas protection measures
inspected:

Details of issues

Approved by

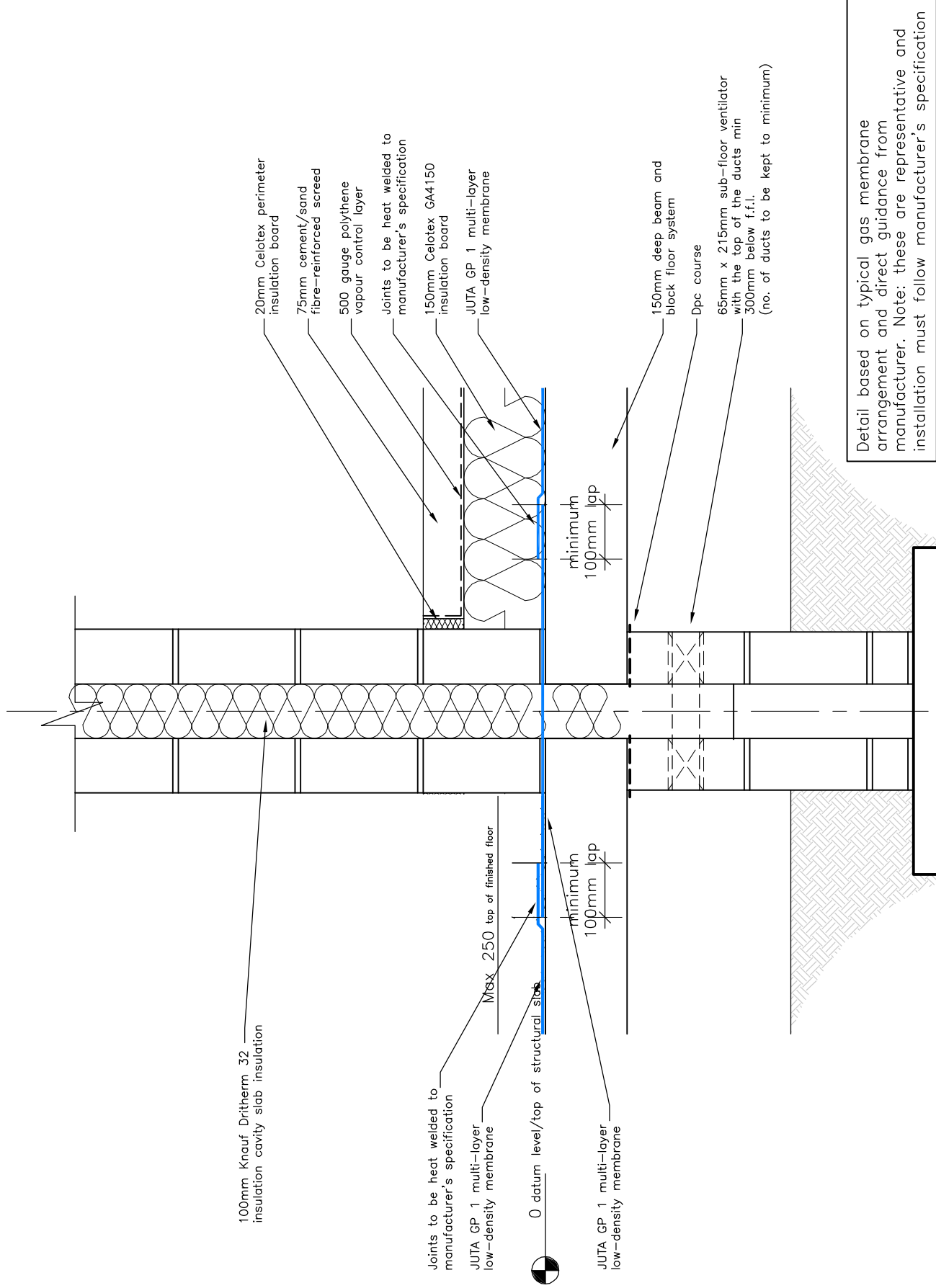
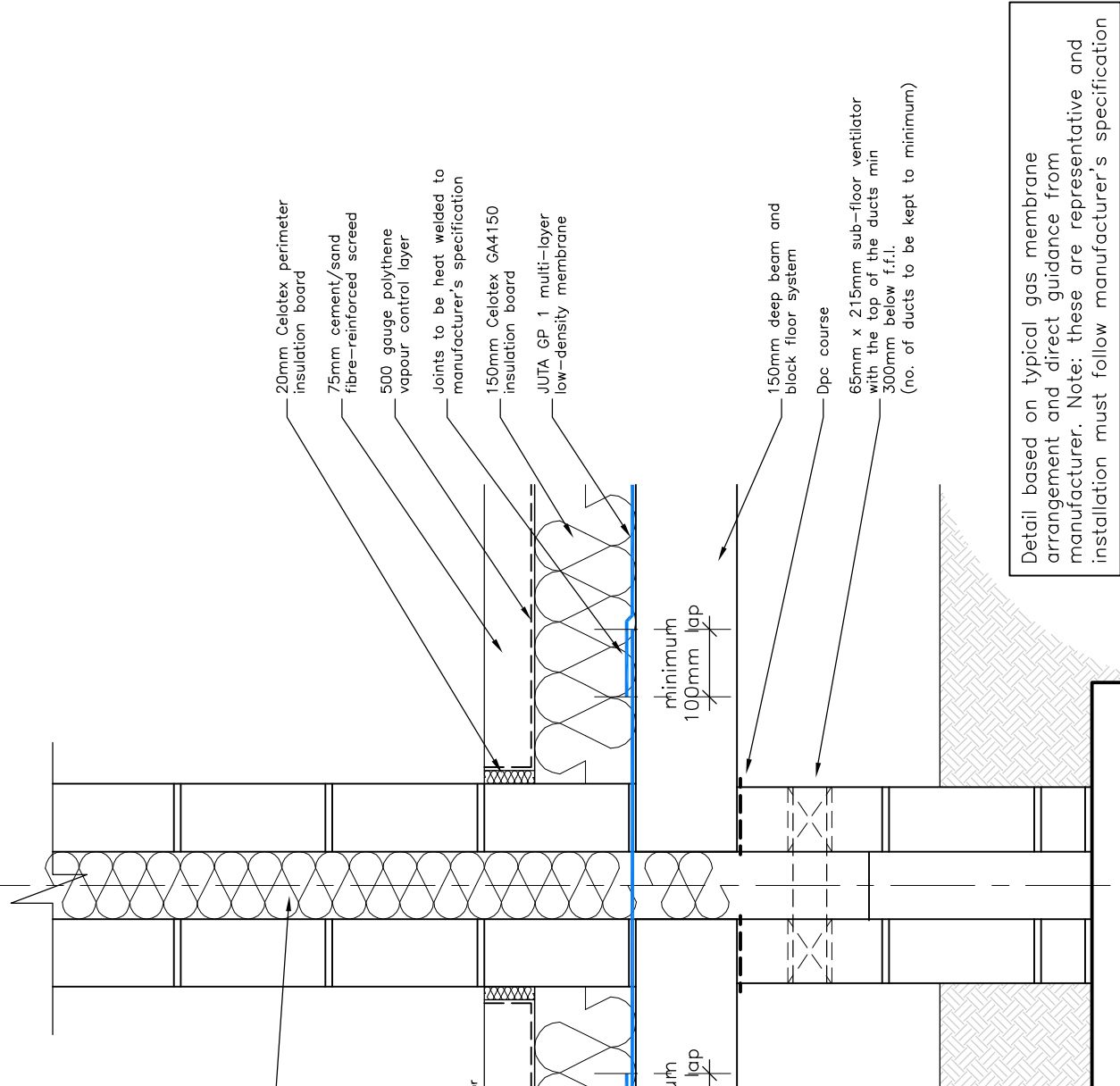
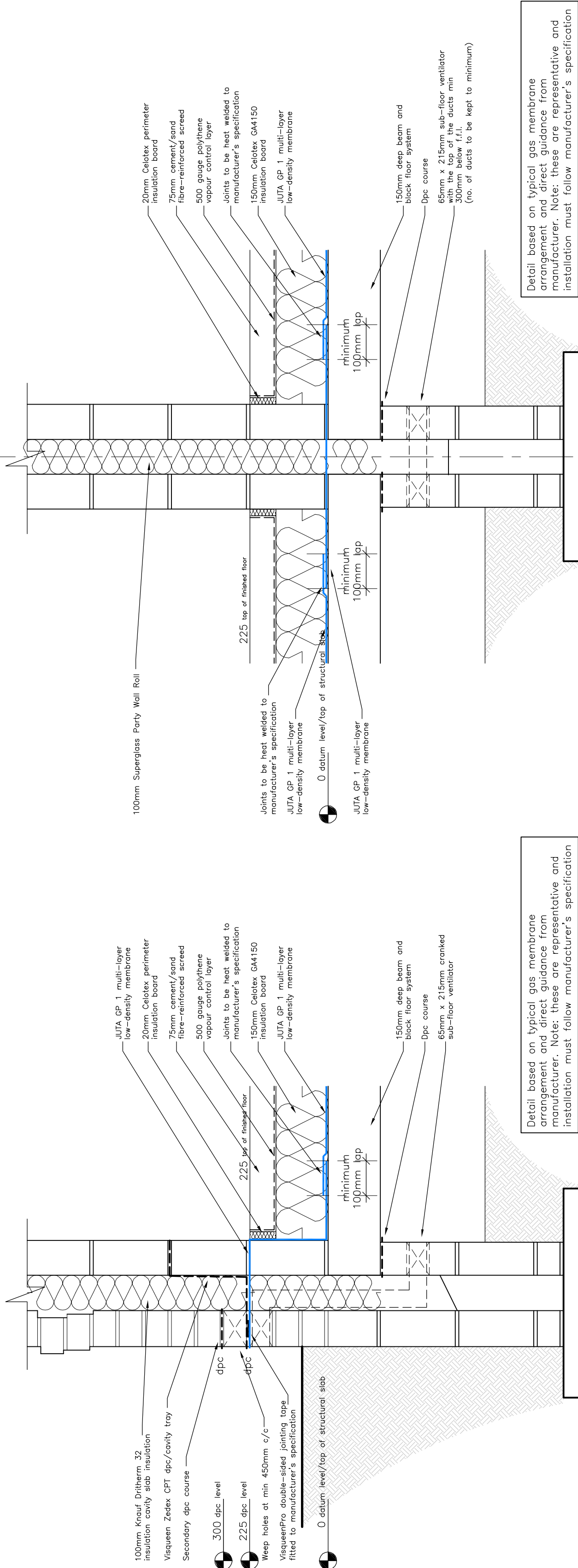
No users

Date

APPENDIX B

Construction Drawing





DETAIL GM03
Typical Attached Garage
Separating Wall Detail

SCALE 1:10
DATE 01/12/2021

DRAWING TITLE
Hamblewood - Substructure Details - Gas
Protection Measures



APPENDIX C

GP1 Technical Specification and BBA Certificate



Juta GP[®] 1 - Gas Barrier is a multi-layer, low density polyethylene membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil. GP[®] 1 is specifically designed and manufactured to perform as a Methane, Carbon Dioxide, Radon, Ground Gas, VOC /Hydrocarbon vapors, air & moisture protection system.

JUTA GP [®] 1			
Characteristics	Test Method	Unit	JUTA GP [®] 1
Physical Properties			
Thickness	EN 1849-2	mm	0.6
Thickness - Between Scrim	BS EN ISO 9863-1:2016	Mm	0.4
Width	EN 1849-2	m	Various
Length	EN 1849-2	m	Various
Weight	EN 1849-2	G/M2	370
Hydraulic Properties			
Thickness	EN 20811	-	>300
Resistance to Water Penetration	EN 13967, EN 1928	-	Pass
Water Tightness	EN 1296, EN 1367, EN 1928	-	Pass
Hydraulic Properties			
Resistance to Static Load	EN 12730-B	Kg	20
Tensile Strength (MD)	EN 12311-1	N/50mm	600
Tensile Strength (CMD)	EN 12311-1	N/50mm	480
Tensile Elongation (MD)	EN 12310-1	%	20
Tensile Elongation (CMD)	EN 12310-1	%	20
Puncture Resistance	EN 12236	kN	1.25
Resistance to Tearing (Nail Shank) MD	EN 12310-1	N	330
Resistance to Tearing (Nail Shank) CMD	EN 12310-1	N	400
Durability and Chemical Resistance			
Transmission Rate of Volatile Liquids - Diesel	ISO 6179:2010 (B)	g/m ² /h	0.246
Transmission Rate of Volatile Liquids - Xylene	ISO 6179:2010 (B)	g/m ² /h	0.571
Transmission Rate of Volatile Liquids - Toluene	ISO 6179:2010 (B)	g/m ² /h	0.583
Transmission Rate of Volatile Liquids - Petrol	ISO 6179:2010 (B)	g/m ² /h	0.135
Gas Permeability			
Methane Permeability	BS EN ISO 15105-1	ml/m ² /day/atm	<0.09
Carbon Dioxide Permeability	BS EN ISO 15105-1	ml/m ² /day/atm	<0.09
Radon Permeability	K124/02/95	m ² /s	8.0 x 10 ⁻¹⁵
Compliance and Certification			
CE Mark - EN13967:2012			
NHBC Standards Compliant			
BS 8485:2015 + A1 2019 Accordant			
BBA Certified - Certificate No. 12/4912			

Contact us to find out more information.
info@juta.co.uk | 01772 754177 | JUTA.CO.UK
Melton Grove Works, Church Road, Lytham, FY8 5PL

JUTA



riba
product
selector

Additional Information

HANDLING

Roll weights can be in excess of 20kg and hence appropriate care and equipment is required for unloading and handling.

STORAGE

Rolls of JUTA GP® 1 should be stored on stable/level ground and stacked not more than five rolls high, with no other material stacked on top. The rolls can be stored outdoors when packaged, but should be protected from exposure to UV.

INSTALLATION

JUTA GP® 1 should be installed in accordance with the product installation guidelines, and in accordance with BS 8485:2015.

JOINTING AND SEALING

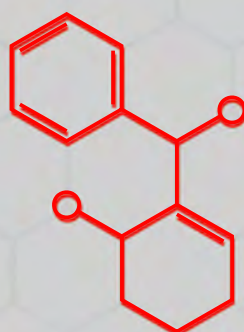
It is recommended JUTA GP® 1 be heat welded where possible, with welding carried out by competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS 8485:2015. JUTA GP® 1 should be overlapped by at least 100mm. If taping joints, only suitable tape must be used, ensuring application with a silicone roller to remove trapped air. JUTA pre-formed details, or Self Adhesive Gas Membrane are available for sealing around protuberances.

ACCESSORY PRODUCTS

-  JUTA GP® 1 Starter Band
-  JUTA GP® Tape
-  JUTA GP® Self Adhesive Membrane
-  JUTA GP® Primer
-  JUTA GP® Top Hats and Preformed Corners
-  JUTA GP® Protection Fleece
-  JUTA GP® Void Vent (25/40mm)

PLEASE CONTACT JUTA UK DIRECTLY FOR MORE INFORMATION ON JUTA GP® 1

Contact us to find out more information.
info@juta.co.uk | 01772 754177 | JUTA.CO.UK
Melton Grove Works, Church Road, Lytham, FY8 5PL

**JUTA****riba**
product
selector

JUTA GAS-RESISTANT AND DAMP PROOFING MEMBRANES

GP1 GAS BARRIER

This Agreement Certificate Product Sheet⁽¹⁾ relates to GP1 Gas Barrier, for use as a low-density polyethylene (LDPE) gas barrier and damp-proof membrane in concrete ground floors, above and below the slab not subject to hydrostatic pressure, to protect the building against moisture, radon, methane and carbon dioxide from the ground.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Resistance to water and water vapour — the membrane provides an effective barrier to the passage of liquid water and water vapour from the ground (see section 6).

Resistance to underground gases — the membrane is capable of restricting the ingress of radon, methane and carbon dioxide into the building (see section 7).

Resistance to puncture — the membrane has a high resistance to puncture and on a smooth or blinded surface will not be damaged by foot or site traffic (see section 8).

Durability — under normal service conditions, the membrane will remain effective against the ingress of water and water vapour, and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the flooring construction in which it is installed (see section 12).

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 11 March 2020

Hardy Giesler
Chief Executive Officer



The BBA is a UKAS accredited certification body – Number 113.
The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agreement Certificate by either referring to the BBA website or contacting the BBA directly.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

©2020

Regulations

In the opinion of the BBA, GP1 Gas Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C1(2)	Site preparation and resistance to contaminants
Comment:		When properly installed in a correctly designed structure, the membrane forms an effective barrier to radon, methane and carbon dioxide, enabling compliance with this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		When properly installed in a correctly designed structure, the membrane forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Requirement. See sections 6.1 and 6.2 of this Certificate.
Regulation:	7(1)	Materials and workmanship
Comment:		The membrane is an acceptable material. See section 12.1 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The membrane can contribute to a construction satisfying this Regulation. See section 12.1 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.1	Site preparation – harmful and dangerous substances
Standard:	3.2	Site preparation – protection from radon gas
Comment:		The membrane will enable a floor to satisfy the requirements of these Standards, with reference to clauses 3.1.2 ⁽¹⁾⁽²⁾ , 3.1.6 ⁽¹⁾⁽²⁾ , 3.1.7 ⁽¹⁾⁽²⁾ , 3.1.8 ⁽¹⁾⁽²⁾ , 3.2.1 ⁽²⁾ and 3.2.2 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		When properly installed in a correctly designed structure, the membrane forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Standard, with reference to clauses 3.4.2 ⁽¹⁾⁽²⁾ , 3.4.4 ⁽¹⁾⁽²⁾ and 3.4.6 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The membrane can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		Comments in relation to the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23(a)(i)	Fitness of materials and workmanship
Comment:	(iii)(b)(i)	The membrane is acceptable. See section 12.1 and the <i>Installation</i> part of this Certificate.
Regulation:	26	Site preparation and resistance to contaminants
Comment:		When properly installed in a correctly designed structure, the membrane forms an effective barrier to radon, methane and carbon dioxide enabling compliance with this Regulation. See section 7.1 of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		When properly installed in a correctly designed structure, the membrane forms an effective barrier to the movement of water within the ground floor slab, enabling compliance with this Regulation. See sections 6.1 and 6.2 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

Additional Information

NHBC Standards 2020

In the opinion of the BBA, GP1 Gas Barrier, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 4.1 *Land quality – managing ground conditions* and 5.1 *Substructure and ground bearing floors*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European Standard BS EN 13967 : 2012.

Technical Specification

1 Description

1.1 GP1 Gas Barrier is a multilayer, LDPE membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil.

1.2 The membrane has the following nominal characteristics:

Thickness (mm)	0.6 (including reinforcement scrim)
Effective thickness (mm)	0.4 (measured between the reinforcement scrim)
Roll length (m)	various
Roll width (m)	various
Mass per unit area (g·m ⁻²)	370
Tensile strength (N·50 mm ⁻¹)	
Machine direction	600
Cross direction	480
Elongation (%)	
Machine direction	20
Cross direction	20

Nail tear resistance (N)	
Machine direction	330
Cross direction	400
Watertightness	pass
Colour	
upper surface	various
lower surface	various.

1.3 Ancillary products for use with the membrane include:

- butyl or bitumen tape — for use for joints and laps
- jointing tape — for securing laps and joints.

1.4 Ancillary products for use with the membrane, but outside the scope of this Certificate, include:

- GP Top Hats — to seal around entry points to the membrane
- GP Internal Corner Cloaks — prefabricated corner details
- GP External Corner Cloaks — prefabricated corner details
- GP Primer — used to provide adhesion for application of bitumen enhanced geomembranes
- GP Void Vent 25 — cusped high-density polyethylene (HDPE) drainage core with a non-woven polypropylene geotextile separator/filter bonded to one side
- GP Void Vent 40 — cusped HDPE drainage core with a non-woven polypropylene geotextile separator/filter bonded to one side
- GP Protection Fleece — to form a protective layer to prevent damage to the membrane
- GP-SAM — gas-resistant self-adhesive membrane
- GP DPC — a gas resistant damp-proof course (dpc).

2 Manufacture

2.1 The membrane is manufactured by an extrusion/coating process.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of ČSN EN ISO 9001 : 2016 and ČSN EN ISO 14001 : 2016 by Bureau Veritas (Certificates CZ006792-1 and CZ002815-1 respectively).

3 Delivery and site handling

3.1 Rolls are wrapped in polythene film. Each roll has a leaflet enclosed describing the membrane and installation details. The BBA logo and the number of this Certificate are printed on the leaflet and pallet label.

3.2 The rolls must be stacked on a flat surface, kept under cover and protected from sunlight and mechanical damage.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on GP1 Gas Barrier.

4 Use

4.1 GP1 Gas Barrier is satisfactory for use as a gas-resistant barrier to restrict the ingress of radon, methane and carbon dioxide into buildings from landfill and naturally occurring sources.

4.2 Buildings in areas of risk should be constructed in accordance with the recommendations of BRE Report BR 211 : 2015 and following the guidance set out in BS 8485 : 2015.

4.3 The membrane is also satisfactory for use as a damp-proof membrane in accordance with CP 102 : 1973 Section 3, BS 8000-0 : 2014 and BS 8000-4 : 1989.

5 Practicability of installation

The membrane is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Resistance to water and water vapour



6.1 The membrane, including joints, provides an effective barrier to the passage of liquid moisture from the ground.

6.2 The membrane will comply with the minimum sheet thickness detailed in the documents supporting the national Building Regulations.

6.3 The membrane is impervious to water and provides a waterproof layer capable of accepting minor structural movements without damage.

7 Resistance to underground gases



7.1 The membrane will restrict the ingress of radon, methane and carbon dioxide into buildings from landfill and naturally occurring sources and satisfy the performance criteria for a gas-resistant membrane as defined in BS 8485 : 2015.

7.2 Measured gas permeability/diffusion values on unjointed membrane are given in Table 1.

Table 1 Gas permeability of GP1

Gas	Method	Result
Methane ⁽¹⁾	BS ISO 15105-1	$<0.09 \text{ ml} \cdot \text{m}^2 \cdot \text{day}^{-1} \cdot \text{atm}^{-1}$
Carbon dioxide	BS ISO 15105-1	$<0.09 \text{ ml} \cdot \text{m}^2 \cdot \text{day}^{-1} \cdot \text{atm}^{-1}$
Radon	K124/02/95	$8.0 \times 10^{-15} \text{ m}^2 \cdot \text{s}^{-1}$

(1) BS 8485 : 2015 requires that the methane transmission measured in accordance with BS ISO 15105-1 : 2007 for a gas-resistant membrane is $<40 \text{ ml} \cdot \text{m}^2 \cdot \text{d}^{-1} \cdot \text{atm}^{-1}$.

7.3 In the opinion of the BBA, the membrane satisfies the criteria for a radon gas resistant membrane of BRE Report BR 211 : 2015.

8 Resistance to puncture

8.1 The membrane can be punctured by sharp objects and care should be taken when handling building materials over the exposed surface.

8.2 Provided there are no sharp objects present on the membrane's surface prior to and during installation of the protective layer, the membrane will not be damaged by normal foot traffic.

9 Compatibility with other materials

The membrane contains an aluminium foil interlayer which may be subject to corrosion by alkaline conditions if damage to the membrane and exposure occurs. However, under normal circumstances, the polyethylene faces of the membrane are compatible with other materials and products typically used in the same areas, with the exception of those containing pitch.

10 Underfloor heating

There will be no adverse effect on the membrane from the underfloor heating under normal service conditions. In other circumstances, the Certificate holder's advice should be sought.

11 Maintenance

As the membrane is confined under concrete and has suitable durability (see section 12), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 15).

12 Durability



12.1 The membrane will, in normal circumstances, remain effective against the ingress of water and water vapour, and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the building.

12.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane.

Installation

13 General

13.1 GP1 Gas Barrier must be installed and fixed in accordance with this Certificate, the Certificate holder's instructions, the relevant clauses of BRE Report BR 211 : 2015 and the guidance given in BS 8485 : 2015.

13.2 The membrane can be installed in all normal site conditions, provided that the air temperature is not below 5°C to prevent the risk of surface condensation.

14 Procedure

14.1 The membrane must only be applied to surfaces that have a smooth finish, ie they should be free from voids, projections and mortar deposits. Surfaces should be dry and free from dust and frost.

14.2 Concrete surfaces should be dense. Vertical surfaces of brickwork and blockwork must be dry and rendered to provide an even surface. Brickwork or blockwork not rendered must be flush pointed to give a smooth surface without sudden changes in level.

14.3 The membrane is rolled out with the printed side uppermost, ensuring that it is properly aligned. All end and side overlaps should be a minimum of 100 mm where taped and prepared in accordance with the Certificate holder's instructions.

14.4 When the membrane is laid below the concrete slab, it should be loose-laid to accommodate any small movements.

14.5 All surfaces must be dried thoroughly prior to joining. Roll edges can be welded or taped. A strip of the tape is unrolled over the membrane with its nearest edge 50 mm from the membrane edge. The protective paper is removed from the butyl tape prior to rolling an adjacent run of the membrane, which must be carefully unrolled over the jointing tape, ensuring a 100 mm overlap.

14.6 All service penetrations and direction changes should be properly detailed in accordance with the Certificate holder's instructions. Service ducts should be vented to prevent the possibility of gas accumulating in confined spaces.

14.7 The continuity of the gas protection must extend over the footprint of the building, and the membrane must be sealed to a gas-resistant dpc where required.

14.8 The membrane should be covered by a screed or other protective layer, such as GP Protection Fleece, as soon as possible after installation. If blockwork protection is used, care must be taken to avoid damage to the membrane during construction.

14.9 The membrane installation should be subject to third-party independent validation, in accordance with BS 8485 : 2015.

15 Repair

Any damage to the membrane must be repaired using a patch of the membrane, and laps welded or sealed with double sided tape and secured with the butyl tape. All patched areas must extend a minimum of 100 mm from the damaged area. If required by the local authority, repair work should be confirmed by an independent validation report, as all gas membrane installations should be subject to third-party validation in accordance with BS 8485 : 2015.

Technical Investigations

16 Tests

16.1 An assessment was made of data to BS EN 13967 : 2012 in relation to:

- tensile strength and elongation
- nail tear resistance
- watertightness
- resistance to static loading.

16.2 Tests were carried out to determine:

- thickness, width, density and mass per unit area
- dimensional stability, low temperature flexibility and water vapour permeability
- tensile strength and elongation (control, heat aged , and UV exposed)
- watertightness (control and heat aged)
- nail tear strength (control and heat aged)
- resistance of joints to air pressure
- tensile strength of joints (control and heat aged)

to assess:

- membrane characteristics
- durability of the membrane and joints.

17 Investigations

17.1 An evaluation was made of the results of the test data regarding permeability of radon, methane and carbon dioxide.

17.2 A site visit was conducted to assess practicability of installation.

17.3 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BRE Report BR 211 : 2015 *Radon : Guidance on protective measures for new buildings*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8485 : 2015 + A1 : 2019 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*

BS EN 13967 : 2012 + A1 : 2017 *Flexible sheets for waterproofing — Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet — Definitions and characteristics*

ČSN EN ISO 9001 : 2016 *Quality management systems — Requirements*

ČSN EN ISO 14001 : 2016 *Environmental management systems — Requirements with guidance for use*

BS ISO 15105-1 : 2007 *Plastics. Film and sheeting — Determination of gas-transmission rate — Differential-pressure methods*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

K124/02-95 *Radon diffusion coefficient by Czech Technical University to test number 124-11 — Measurement of radon coefficient*

18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

APPENDIX D

Gas Membrane Installer Qualification Certificates



Construction Awards Alliance is an alliance
between Cskills Awards and City & Guilds

This

Cskills Awards

Level 2 NVQ Diploma

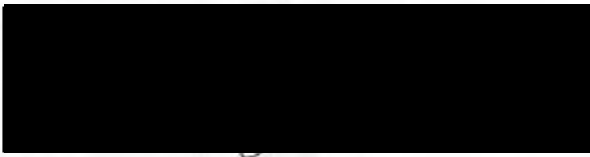
in

**Sub-structure Work Occupations (Construction) -
Installation of Gas Membranes (QCF)**

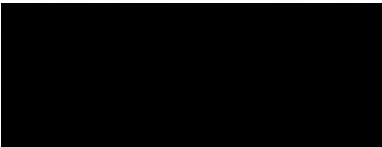
(600/3747/7)

is awarded to

Ian Kelvin Harrison



Carl Rhymer
Delivery and Customer Engagement Director



Chris Jones
Director General
The City & Guilds of London Institute

Regulated by

Ofqual
=====

For more information see <http://register.ofqual.gov.uk>

Issued Date: 10-03-2016

M9264

Registration No: 1862889
DUPLICATE

This

Cskills Awards
Level 2 NVQ Diploma

in

Sub-structure Work Occupations (Construction) - Installation of Gas Membranes (QCF)

(600/7811/X)

is awarded to

Joshua Taylor

Regulated by

Ofqual

■■■■■■■■■■

For more information see <http://register.ofqual.gov.uk>



Carl Rhymer
Delivery and Customer Engagement Director

Issued Date: 14-12-2016

2231668

Registration No: 3322937

This is to certify that

Matthew Jason Bird

has achieved the following Qualification

**NOCN_Cskills Awards Level 2 NVQ Diploma
in Sub-structure Work Occupations
(Construction) - Installation of Gas
Membranes**



Qualification Approval No: 603/1279/8
ULN: 8309829778
Award Date: 22/01/2020
Certificate No: 47196613



Graham Hasting-Evans
Group Managing Director
NOCN Group



Regulated by

Ofqual

For more information see <https://register.ofqual.gov.uk>

APPENDIX E

Floor Construction Detail and Email Confirmation





Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/11/2023, 10:56
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry and cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached houses
Plot No.	Plots 29-30
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☒ Venting ☐ Membrane ☐ Venting and Membrane ☐ Help

2. VENTING

2.1 Sub-floor void	N/A
2.2 External wall airbricks	Airbricks evenly spaced and unobstructed, connected to telescopic vents to sub floor void
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A
Engineer's Prelim Assessment (Vent)	
Pass	

4. PHOTOGRAPHS

Photographs

4 records

Photograph	Photograph Title

		Plot 30 air bricks and telescopic vents
		Plot 30 airbricks
		Plot 29 airbricks and telescopic vents



Plot 29 airbricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	22/11/2023, 10:44
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, dry, cold
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Terraced houses
Plot No.	Plots 47-49
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☒ Venting ☐ Membrane ☐ Venting and Membrane ☐ Help

2. VENTING

2.1 Sub-floor void	Clear from obstructions
2.2 External wall airbricks	N/A
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A
Engineer's Prelim Assessment (Vent)	
Pass	

4. PHOTOGRAPHS

Photographs

3 records

Photograph	Photograph Title

		Floor construction in progress
		Floor construction in progress
		Floor construction in progress

5. PASS/FAIL
The gas protection measures inspected:

Details of issues

Approved by

No users

Date



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	09/08/2023, 14:04
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Sunny, dry, slight breeze
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Semi detached houses
Plot No.	Plot 40-41 perimeter and Plots 50-51 floor construction
Foundation Type	Suspended
Gas Protection Type	Passive
What is being inspected	☐ Venting ☐ Membrane ☒ Venting and Membrane

1. MEMBRANE

1.1 Condition of sub-grade and underside of membrane	Unable to inspect as sealed
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Generally good condition some dust and mortar
Jointing tape product	Heat sealed joins and butyl detailing strip
1.5 Lapping design	At least 100mm
1.6 Laps, welds and joints seals	All joins heat sealed and well sealed. Patch repairs completed with butyl detailing strip
1.7 Service seals	Site made service seals with butyl detailing strip and well sealed

Engineer's Prelim Assessment (Mem)

Pass

2. VENTING

2.1 Sub-floor void	Plots 50-51 - void in construction
2.2 External wall airbricks	Plots 40-41 air bricks installed at regular intervals and unobstructed
2.3 Internal sleeper walls	N/A
External vent trenches/ducts	N/A

Engineer's Prelim Assessment (Vent)

Pass

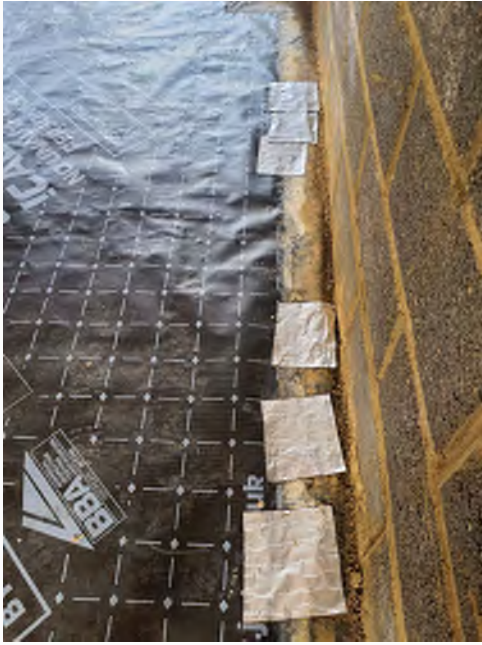
4. PHOTOGRAPHS

Photographs

10 records

Photograph	Photograph Title
	Plots 50-51 floor construction
	Plot 50 floor construction

		Plot 51 floor construction
		Plot 41 overview



Plot 41 patch repairs



Plot 41 service



Plot 40 overview



Plot 40 membrane join

	Plot 40 services
	Plot 40 airbricks

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

No users

Date

From: [Callum Safe](#)
To: [Fiona Goode](#)
Subject: RE: DC/21/91535 - Pollution comment C13 partial discharge Block B and PLOTS 22-28, 83-85 & 92-94 F/19/86829 Serenity, Heath House Lane
Date: 10 January 2023 15:40:03
Attachments: [image013.png](#)
[image017.png](#)
[image018.png](#)
[image019.png](#)
[image020.png](#)
[image021.png](#)
[image022.png](#)
[image494387.png](#)
[Site Inspection Report - PL-PG-10014938 23.06.2022.pdf](#)
[Site Inspection Report - PL-PG-10014938 18.07.2022.pdf](#)

Hi Fiona,

Thanks for looking at this.

I'm not sure I'm going to be able to find evidence for each plot, but I do have the attached photo of the ground floor beams going on block B. I also have a few of the inspection reports from our warranty provider where they have noted the presence of a well ventilated subfloor void and telescopic vents.

I can confirm that we are allowing a minimum 250mm floor void ventilated with telescopic vents to exceed 1500mm² per meter run of external wall and 500mm² per m² of floor area positioned opposite walls to allow crossflow to all ground floor slabs.

There is no intention of importing any soils for soft landscaping/garden areas.

Kind regards,

CALLUM SAFE | Technical Coordinator

t: 02380 602255

www.bargatehomes.co.uk 




BARGATE
HOMES

**NEW HOMES
FOR PEOPLE
WHO DON'T BUY
NEW HOMES...**

Address: The New Barn Vicarage Farm Business Park, Winchester Road, Fair Oak, Hampshire SO50 7HD. Company Registration Number: 05626135

This message is intended solely for the addressee and may contain private and confidential information. If you're not the intended recipient, please let us know immediately and delete this message and any attachments. Where this is the case, please do not use, share, distribute or copy this message and its attachment.