

VERIFICATION REPORT

for land at

**BLOCKS A & D, HAMBLEWOOD,
HEATH HOUSE LANE, HEDGE END,
HAMPSHIRE, SO30 0LE**

on behalf of

BARGATE HOMES

Report:	VERIFICATION REPORT
Site:	BLOCKS A & D, HAMBLEWOOD, HEATH HOUSE LANE, HEDGE END, HAMPSHIRE, SO30 0LE
Client:	BARGATE HOMES
Date:	10/08/2022
Reference:	GE20045/VR/BLOCKS A & D/AUG22
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AMENDMENT RECORD

Revision ref.	Date	Reasons for amendment	Author's initials	Reviewed by	Approved by
1.0	10/08/2022	First issue for Blocks A and D	FG	LL	SA

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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 Blocks A and D, 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 Blocks A and D 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.

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 Blocks A and D 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 Blocks A and D 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 of 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. Independent verification of gas protection measures at various stages of the development with respect to Blocks A and D was undertaken by Geo-Environmental on behalf of Bargate Homes, and included several inspection visits undertaken between March and July 2022, details of which are presented below:

- 29th March 2022 (Blocks A and D perimeter);
- 25th July 2022 (Block D whole floor area excluding stairwell);
- 26th July 2022 (Block A whole floor area and Block D stairwell);
- 28th July 2022 (Block A stairwell and separate room, and Block D stairwell - re-inspection).

Blocks A and D comprised a series of apartment flats. Floor construction within these blocks 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.

The gas membranes were installed within Blocks A and D by specialist membrane installers from Dance-Reeves Limited. The membranes utilised were black Juta GP1 gas resistant membranes and black Memtech M1 ground gas barrier. 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;
- Black Memtech M1 ground gas barrier;
- Pro Detailing Strip;
- Juta GP Tape (extruded butyl tape).

Three defects were noted during the validation inspection undertaken on 26th July 2022, within the stairwell of both blocks where temporary scaffold handrails were in contact with the floor preventing the membrane from being installed/sealed, and within a separate ground floor room in Block A where the whole floor membrane had not been fully sealed to the perimeter membrane. Advice was given to the site manager to remove the scaffold poles from the floor to allow for the membrane to be installed and to fully seal the whole floor membrane to the perimeter membrane. It was also advised not to reinstall the scaffold handrails until the gas membrane was covered and protected. These areas were re-inspected by Geo-Environmental on 28th July 2022, to confirm that the remedial works were completed, and the installed membranes were fully sealed. It was noted that the bottom portion of the scaffold hand rails had been cut off to prevent them from causing any subsequent damage.

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 RSV. 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 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.

5.0 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 Blocks A and D, 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 and Plots re-inspected. 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. 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 Blocks A and D. 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  Geo-Environmental		
Ref No:	GE20045	Revision:	1.0			
Drawn:	FG	Date:	10/08/2021			
Figure:	1	Scale:	Not To Scale			



APPENDIX A

Visual Inspection Records



Project Name	Hamblewood
Project No.	GE20045
Client	Bargate
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	29/03/2022, 15:28
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Drizzle, still, overcast
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Block A and D 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 where able to inspect
1.2 Gas membrane type	Black juta gp1 gas resistant membrane
1.3 Gas membrane condition	Generally good condition some mortar and mud but membranes have been swept
Jointing tape product	Heat sealed joints and detailing strip used
1.5 Lapping design	At least 150mm overlap
1.6 Laps, welds and joints seals	All heat sealed and well sealed
1.7 Service seals	Site made seals using detailing strip

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

15 records

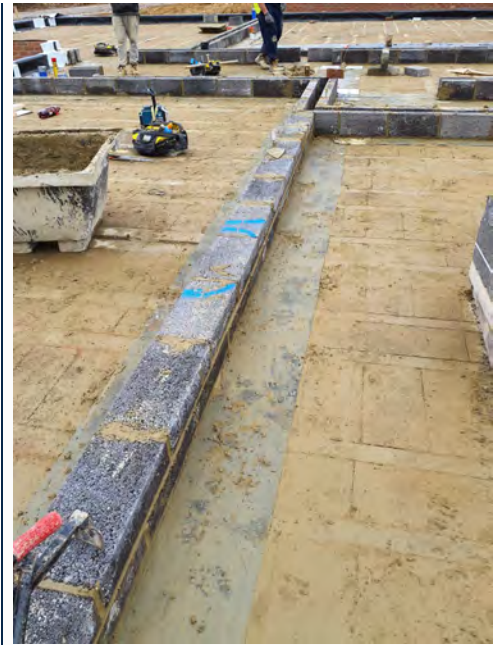
Photograph	Photograph Title



Block D perimeter



Block D service and corner



Block D internal



Block D corner and service



Block D



Block D service

	Block D
	Block D membrane for internal wall
	Block A overview



Block A



Block A internal wall



Block A corner



Block A service



Block A vents

		Block A threshold
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5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

Fiona Goode

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	25/07/2022, 15:00
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Overcast, still, warm
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Flats
Plot No.	Block D whole floor area
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 and Memtech M1 ground gas barrier black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	Butyl detailing strip, joins heat sealed
1.5 Lapping design	At least 150mm
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

4. PHOTOGRAPHS

Photographs

13 records

Photograph	Photograph Title

		Block D cycle store
		Block D binstore
		Block D service seal



Block D overview



Block D membrane seals



Block D threshold and service detail

		Block D patch repair
		Block D overview
		Membrane type



Detailing strip



Block D service seals

	Membrane
	Block D joins

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

Fiona Goode

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	26/07/2022, 15:28
Site Engineer	
 Fiona Goode	fiona.goode@gesl.net
Weather at time of inspection	Warm, slight breeze, sunny spells
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Apartments
Plot No.	Block D (stairwell) and Block A
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 and Memtech M1 ground gas barrier black
1.3 Gas membrane condition	Generally good condition some signs of foot traffic
Jointing tape product	Butyl detailing strip
1.5 Lapping design	At least 150mm
1.6 Laps, welds and joints seals	All heat sealed. In stairwell of both blocks scaffolding has prevented sealing of the floor. Scaffold needs lifting to complete
1.7 Service seals	Site made seals, all well sealed

Engineer's Prelim Assessment (Mem)

Remedial Measures Required

4. PHOTOGRAPHS

Photographs

17 records

Photograph	Photograph Title

		Block D
		Block D

 A close-up photograph showing a black gas protection membrane with white text and a grid pattern. Two vertical metal rods are positioned on the membrane, and a small white object is visible between them. The text on the membrane includes "CAUTION", "NO UNAUTHORIZED PERSONNEL", "INSPECTED BY", and "BBIA".		Block D
 A close-up photograph showing a black gas protection membrane with white text and a grid pattern. The membrane is partially covered by a concrete slab, and a small white object is visible between them. The text on the membrane includes "CAUTION", "NO UNAUTHORIZED PERSONNEL", "INSPECTED BY", and "BBIA".		Block D
 A wide-angle photograph of a room with a gas protection membrane on the floor. The membrane is black with white text and a grid pattern. The room has concrete walls and several windows. The text on the membrane includes "CAUTION", "NO UNAUTHORIZED PERSONNEL", "INSPECTED BY", and "BBIA".		Block A



Block A membrane joins



Block A services

	Block A corridor
	Block A services
	Block A overview

 A close-up photograph of a black, diamond-patterned gas membrane. The text 'GP 1 GAS MEMBRANE' is printed in large, bold letters. Below it, a yellow 'CAUTION!' tape with black text reads 'NO UNAUTHORISED PERSONNEL'. Two inspection labels are visible: one from 'BBA' (Building Barriers Association) and another from 'NSAI' (National Safety Authority) with the text 'Agreement: JURA GP 1 CERT No. 16-0388'.		Block A membrane
 A photograph showing the GP 1 Gas Membrane installed in a room corner. The membrane is laid out on the floor, with the 'CAUTION!' tape and 'GP 1 GAS MEMBRANE' text visible. The room has a brick wall and a concrete pillar.		Block A communal



Block A



Block A under stairs



Block A

	Block A store
	Block A store

5. PASS/FAIL

The gas protection measures inspected:

Details of issues

Approved by

Fiona Goode

Date

Project Name	Hamblewood
Project No.	GE20045
Client	Bargate Homes
Geo-Environmental Project Manager's Email	Fiona.goode@gesl.net
Date	28/07/2022, 14:24

Site Engineer

 Fiona Goode fiona.goode@gesl.net

Weather at time of inspection	Cloudy, warm, breezy
Gas Characteristic Situation	Characteristic Situation 2
Type of development and building/block checked	Detached houses and re-inspection of apartments
Plot No.	Block A and D, Plots 27-28 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 where able to inspect
1.2 Gas membrane type	Juta GP1 gas resistant membrane black
1.3 Gas membrane condition	Good condition some signs of foot traffic
Jointing tape product	Butyl detailing strip
1.5 Lapping design	At least 150mm
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 sealer

Engineer's Prelim Assessment (Mem)

Pass

4. PHOTOGRAPHS

Photographs

14 records

Photograph	Photograph Title



Block B Stairwell repair



Block B repair

		Block B repair 2
		Block A repair



Block A repair 2



Block A single room repair

	Plot 27 corner
	Plot 27 service detail



Plot 27 garage



Plot 28 air bricks



Plot 28 details



Plot 28 garage



Plot 28 corner



Plot 28 membrane joins

5. PASS/FAIL

The gas protection measures
inspected:

Details of issues

Approved by

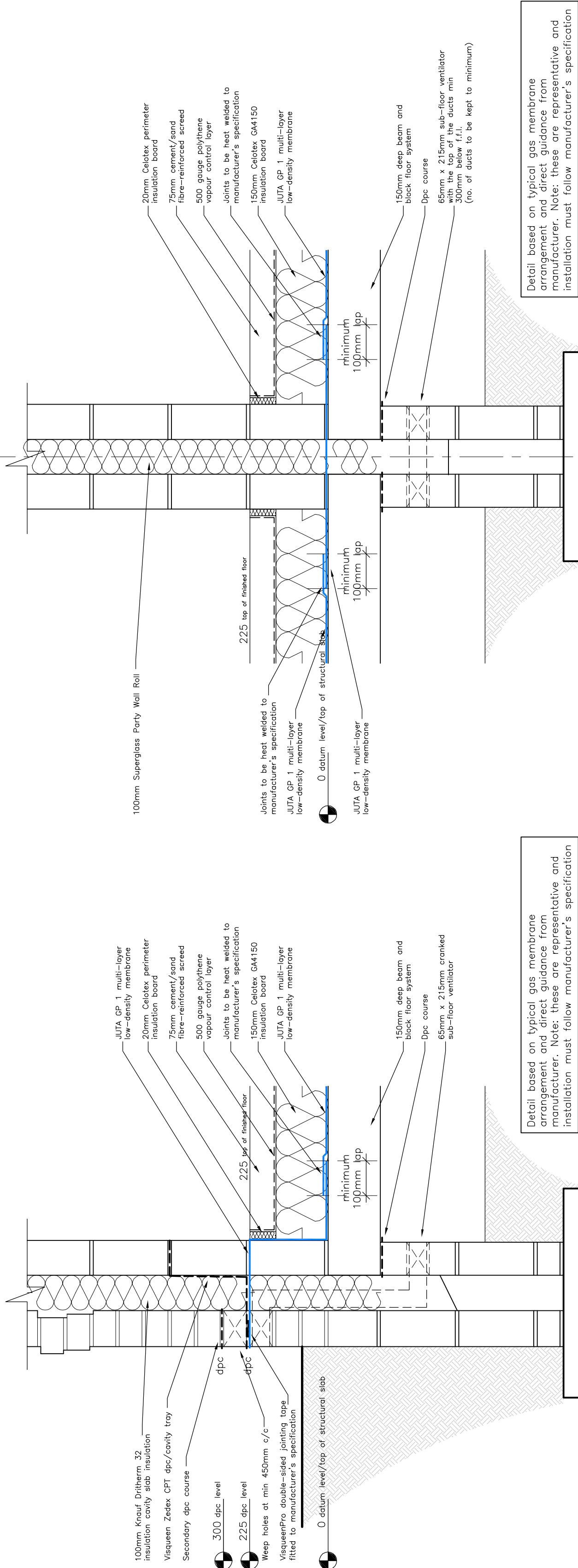
Fiona Goode

Date

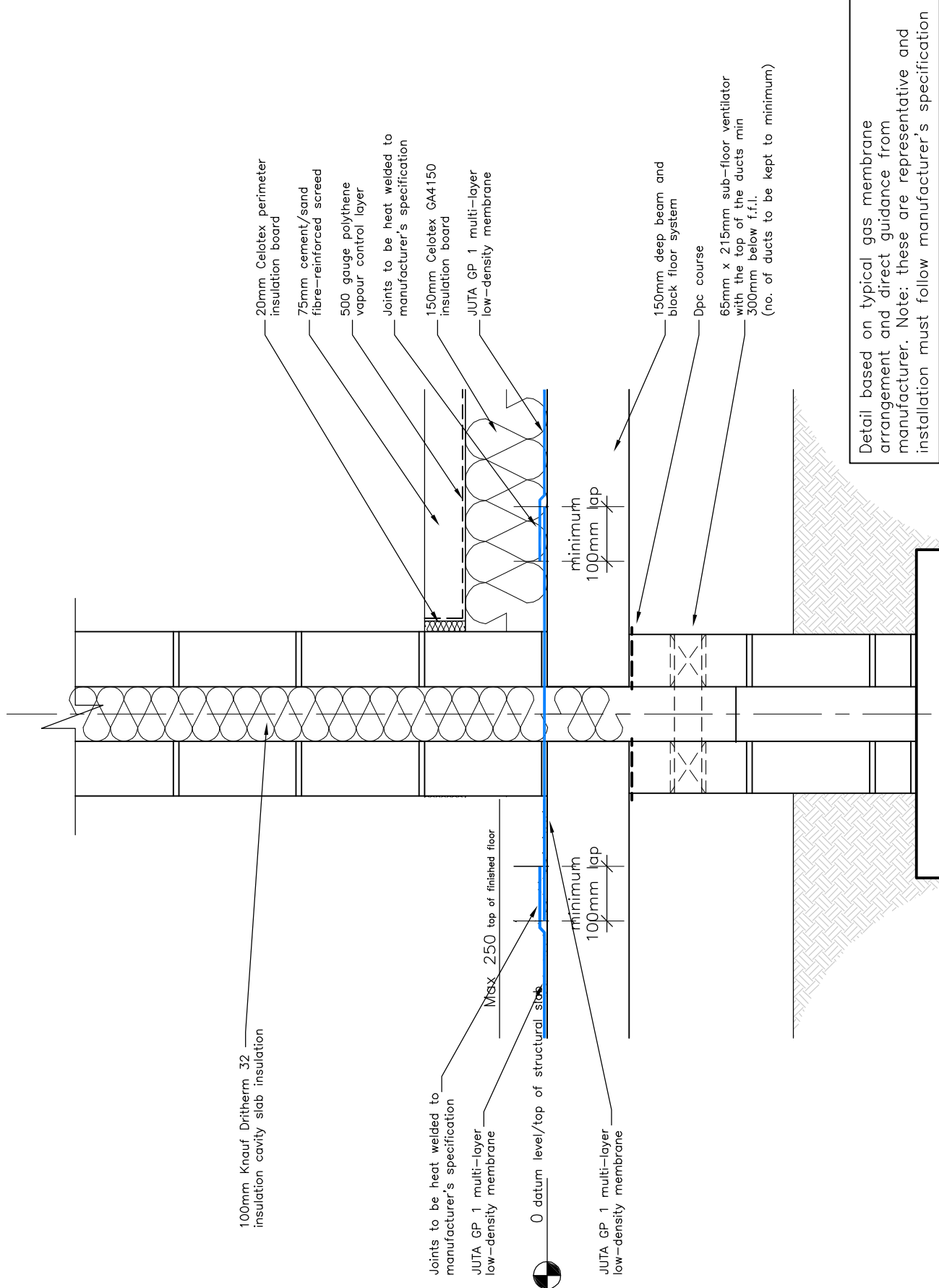
APPENDIX B

Construction Drawing

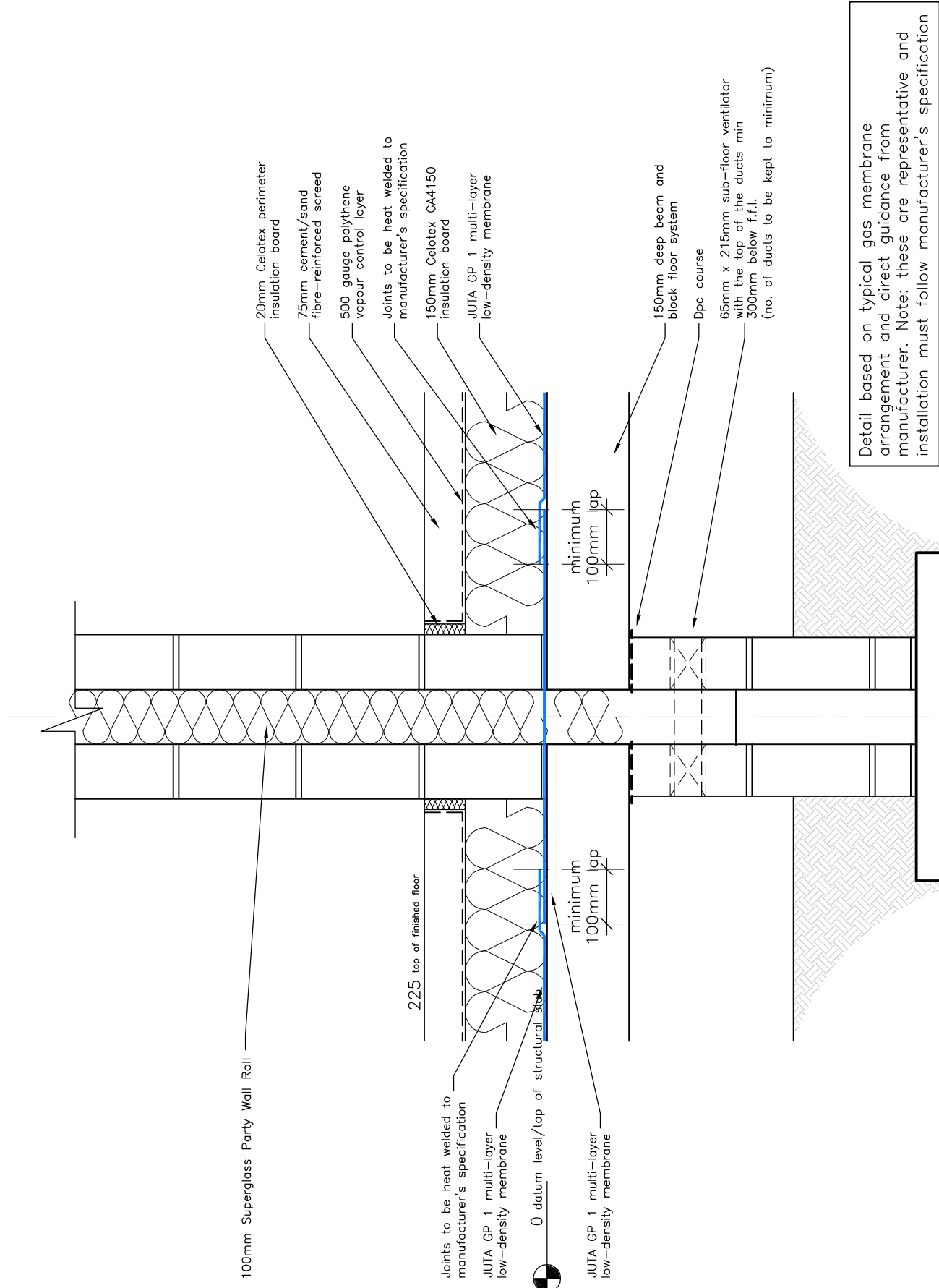




DETAIL GM01
Typical External Cavity
Wall Detail



DETAIL GM03
Typical Attached Garage
Separating Wall Detail



DETAIL GM02
Typical Party Wall
Detail

SCALE 1:10
DATE 01/12/2021

DRAWING TITLE
Hamblewood - Substructure Details - Gas
Protection Measures



153-SB-100-1st

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/m2/h	0.246
Transmission Rate of Volatile Liquids - Xylene	ISO 6179:2010 (B)	g/m2/h	0.571
Transmission Rate of Volatile Liquids - Toluene	ISO 6179:2010 (B)	g/m2/h	0.583
Transmission Rate of Volatile Liquids - Petrol	ISO 6179:2010 (B)	g/m2/h	0.135
Gas Permeability			
Methane Permeability	BS EN ISO 15105-1	ml/m2/day/atm	<0.09
Carbon Dioxide Permeability	BS EN ISO 15105-1	ml/m2/day/atm	<0.09
Radon Permeability	K124/02/95	m2/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			

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

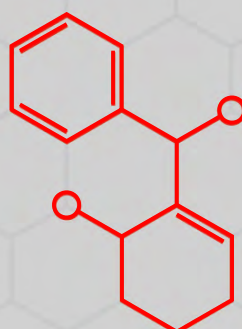
It is recommended JUTA GP® 1 be heat welded where possible, with welding carried out by competent personnel with suitable qualifications in accordance with best practice, and guidance contained within BS 8485:2015. JUTA GP® 1 should be overlapped by at least 100mm. If taping joints, only suitable tape 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

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Agrément Certificate

20/5728

Product Sheet 1

JUTA GAS-RESISTANT AND DAMP PROOFING MEMBRANES

GP1 GAS BARRIER

This Agrément 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 Agrément 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.

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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.