Geotechnical & Environmental Consultants

Plots 1 to 3
Phase 2 Balmoral Way
Holbeach

Ground Gas Verification Plan For Ashwood Homes

Project No: D41012		**Date: 21st November 2022**	
Issue/revision	Prepared by	Checked By	Approved By
	Clare Houghton BSc (Hons) MSc FGS Senior Geo-Environmental Engineer	**Richard Spencer BSc (Hons) MEng MSc** Director	**Richard Spencer BSc (Hons) MEng MSc** Director
Comments			

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This Ground Gas Verification Plan (GGVP) is intended to act as a stand-alone document which draws together the information relating to the ground gas risk assessment and gas protection system design proposals for the development. This GGVP has been prepared in general accordance with CIRIA C735 '*Good practice on the testing and verification of protection systems for buildings against hazardous ground gases*' (2014) and sets out our proposals to inspect the installed gas protection system and BS8485:2015 +A1:2019 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*'. These guidance documents are hereinafter referred to as C735 and BS8485.

We would note that the responsibility for the design of the ground gas protection system rests with others. This GGVP prepared by GeoDyne Ltd serves to summarise the ground gas protection system designed by others and provides a methodology for the verification of installed ground gas protection measures.

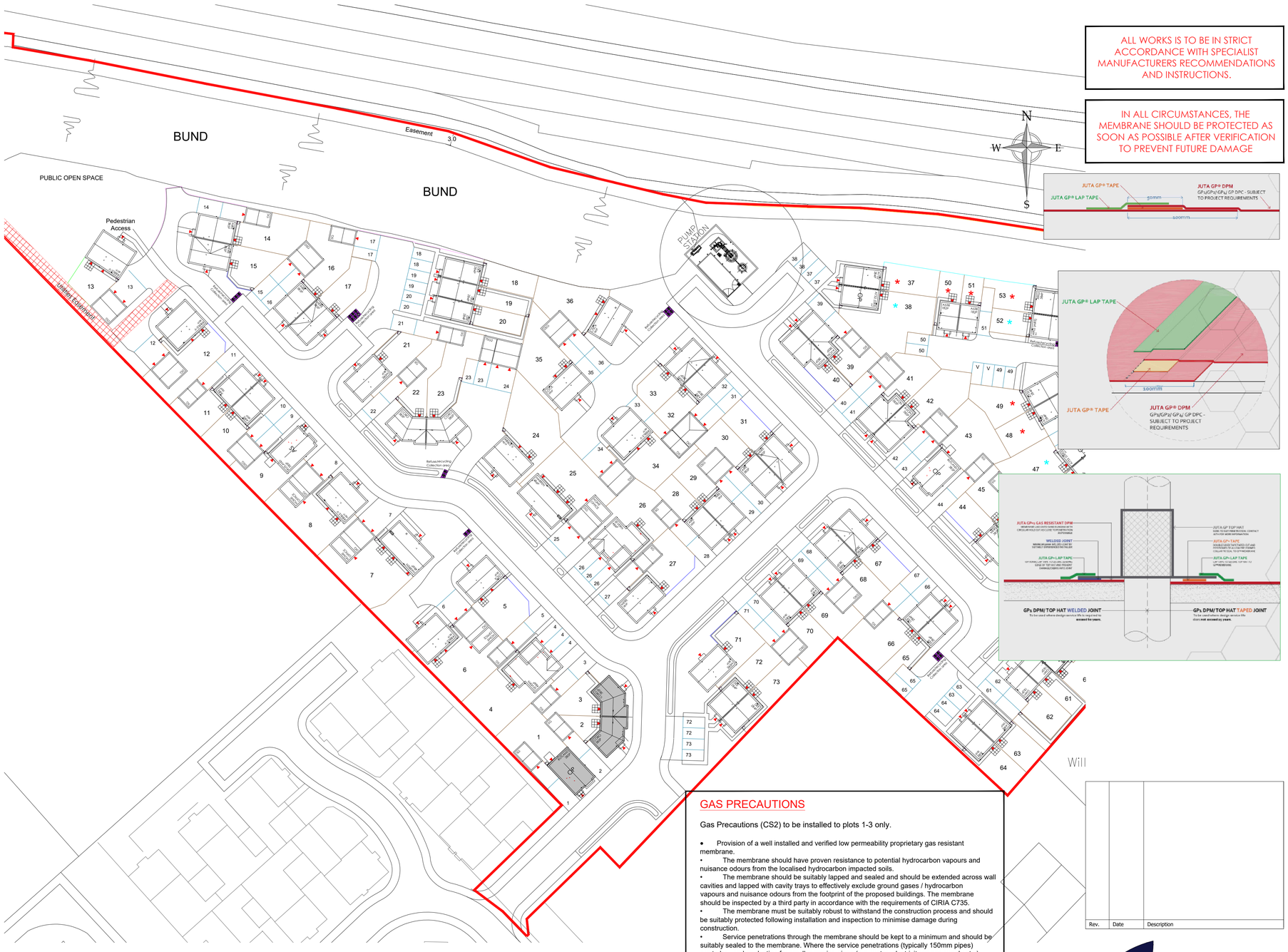
Client	Ashwood Homes
Site Name	Plots 1 to 3, Phase 2 Balmoral Way, Holbeach
Development Proposals	Three residential dwellings (Plots 1 to 3) which are associated with a wider residential development. Specific ground gas / vapour protection measures are not required for all remaining plots within the wider development.
Previous Reports	The following reports have previously been prepared in relation to the site: • GeoDyne Limited report *'Phase 2 Balmoral Way, Holbeach – Combined Phase I Desk Study and Phase II Exploratory Investigation'*, produced for Ashwood Homes, reference D41012, dated 28th April 2021. • GeoDyne Limited letter report *'Phase 2 Balmoral Way, Holbeach – Further Soil Sampling & Hotspot Delineation Works'*, produced for Ashwood Homes, reference D41012, dated 22nd April 2022. • GeoDyne Limited report '*Phase 2 Balmoral Way, Holbeach – Remediation Strategy & Verification Plan*', produced for Ashwood Homes, reference D41012, dated 13th July 2022, revision A. • GeoDyne Limited letter report '*Phase 2 Balmoral Way, Holbeach – Former Tanks Hotspot Remediation Validation Report*', produced for Ashwood Homes, reference D41012/V1, dated 6th October 2022. The Exploratory works detailed within the Combined Report identified the presence of a hotspot of hydrocarbon contamination within two exploratory hole locations in the vicinity of on-site Above ground Storage Tanks (ASTs). The report concluded '*It is considered that gas protection measures may ultimately be required to be installed within dwellings constructed in the area of the hydrocarbon impacted ground to mitigate against the potential ingress of hydrocarbon vapours and nuisance odours, subject to the proposed layout and the outcome of further investigation / delineation works and any source removal works*'. Further investigation and delineation works were carried out in the area of the hydrocarbon impacted soils; these works were reported in our letter dated 22nd April 2022 and confirmed the presence of hydrocarbon impacted soils. The report made recommendations for the removal of the affected soils, followed by validation of the excavation sides and base to confirm that all unacceptably contaminated soils had been removed. Our Remediation Strategy dated 13th July detailed the necessary remediation works needed at the site, these works included the removal and validation of the hydrocarbon impacted soils and the precautionary provision of suitable ground gas / vapour protection measures in the area of the hydrocarbon contaminated soils (Plots 1 to 3), following removal and validation of the impacted soils. These protective measures were recommended to mitigate against the ingress any residual hydrocarbon vapours into these three dwellings. Whilst elevated concentrations of methane and carbon dioxide have not been reported at the site, it is understood that ground gas precautions have designed (by others) to be consistent with CS2 requirements and achieve 3.5 points in accordance with BS8485 are proposed, to serve as a method of mitigating the risk of potential hydrocarbon vapour ingress.

Client	Ashwood Homes	
Site Name	Plots 1 to 3, Phase 2 Balmoral Way, Holbeach	
Ground Gas Protection Score	As proposed, to be consistent with CS2 conditions within BS8485.	3.5 points
Ground Gas Protection System Will Comprise:	Structural barrier - cast in-situ monolithic raft with minimal penetrations	1.5 points
	Ventilation measures - none	0 points
	Gas resistant membrane – Juta GP-5 membrane (when validated by an independent third party). It is noted that the Ashwood Homes drawing 'Gas Membrane Details' refers to Juta GP-1 membrane although the installers have specified Juta GP-5 within their Method Statement for the site.	2 points
	Total points achieved by proposed system	3.5 points
Membrane Installers & Qualifications	Omega Lining Solutions (Specialist Membrane Installers) – lead installers hold NVQ Level 2 Sub-Structure Work Occupations (construction – installation of gas membranes), as a minimum.	
Membrane Installation, Jointing & Sealing	Installation Type – total line out. Joints in membrane panels – minimum overlap 100mm sealed by hand welding (hot air fusion). Corners – bespoke corners formed on site from self-adhesive gas resistant membrane (SAGRM), typical minimum overlap of 100mm with membrane. Service Penetrations – bespoke collars formed on site from SAGRM, typical minimum overlap of 100mm with membrane.	
Sub-grade Preparation	The subgrade (i.e. raft) should be swept to remove all debris prior to installation of the membrane. The subgrade should be inspected and approved by the installer prior to commencement of the membrane installation. Where a smooth surface cannot be achieved it may be necessary to provide a sand blinding or geotextile layer across the beam and block floor on top of which the membrane can be placed.	
Verification Proposals	In accordance with the requirements of CIRIA C735, we propose to carry out verification of the infill membrane by air lancing (to ASTM D4437), in conjunction with a visual inspection and mechanical pick testing of the joints, corners and service penetrations. We propose to inspect 100% of the membrane installed. The process will include the following as a minimum: • Review of the installer's relevant qualifications/training certificates. • Obtain photographic records of the membrane during the installation process. An *Inspection of Gas Protection Measures*' pro forma should be completed for each visit, to maintain records of the installed membranes. • Visual inspection of the seams in the membrane to assess the continuity of the membrane throughout the dwellings. Mechanical point stress (Pick) tests will be undertaken along the edge of the seams to identify any unbonded seams (as appropriate). • Visual inspection of the seals around the corners and service pipe penetrations, with point stress testing adopted where appropriate. • Records of all materials used for ground gas protection (inclusive of serial numbers, where possible/appropriate).	

Client	Ashwood Homes
Site Name	Plots 1 to 3, Phase 2 Balmoral Way, Holbeach
Verification Proposals (continued)	Should it become necessary for the membrane installers to deviate from the Standard Detail drawings during the membrane installation, the inspecting Engineer should be notified by the Client. Where considered appropriate by the inspecting Engineer, confirmation and approval of such changes should be sought by the Client from the inspecting Engineer and Local Authority prior to installation. Records and photographic evidence of any changes to the installation detail should be taken by the inspecting Engineer during the inspection visit.
Non-Compliances	Should any non-compliances (i.e. punctures / tears to the membrane, defective joints/seals etc.) be encountered during the inspection, corrective action in accordance with the Omega Method Statement shall be implemented. Following appropriate repair of defective areas, the repair works will be re-inspected by an Engineer from GeoDyne. A photographic record will be obtained of the defective / damaged areas of the membrane and subsequent repair works. The SAGRM to seal the damage should typically extend a minimum of 100mm beyond the area of damage, in all directions. The repair patches should be applied with pressure and ideally heat welded over the damaged section of membrane to form an effective seal over the damage. For larger areas of damage, a patch of the Juta GP-1 Membrane may be used to repair the membrane. This patch should be welded over the damaged area. Any unbonded joints / seals could be repaired by either rewelding with a heat gun or by the application of a SAGRM patch, heat sealed over the unbonded joint seal.
Service Pipe Penetrations	Should there be any instances where service pipe penetrations are to act as ducting for smaller service pipes (i.e. water supply etc.), we would anticipate that these smaller pipes would be installed at a later stage during the construction process and therefore we are unable to inspect the seals of the pipes within the ducting at the time of our inspection visits. An appropriate method of sealing the ducting should be adopted by the Client (such as closed cell expanding foam or an appropriately sealed bung) to minimise the risk of the duct acting as a conduit for ground gases to enter the building.
Post Inspection Membrane Protection	The insulation and finished floor should ideally be placed as soon as possible following validation of the membrane installation. Should any damage occur to the membrane following inspection, the Client should ensure that appropriate remedial action, in accordance with industry good practice is undertaken prior to laying the insulation or finishing the floor. Any damage incurred should be revalidated in accordance with the established methodology.
Validation Report	A single validation report will be prepared following completion of inspection of the gas protection measures (Plots 1 – 3).
General Comments • For a membrane to achieve a score 2 points, the specification and properties of the membrane must be considered based the criteria of Table 7 BS8485:2015 +A1:2019, inclusive of third-party verification in accordance with CIRIA C735 (2014). • Our findings and comments will reflect the suitability of the membrane on the days of our visits and are limited to areas completed, physically accessible and visible to the naked eye. No responsibility will be taken for any areas of membrane that could not be inspected or for any damage which occurs to the membranes after our inspections. • Responsibility for providing, installing the membrane and maintaining the integrity of the membrane in an appropriate manner rests solely with the Client.	
Attachments	Site Layout Plan Showing Gas Membrane Details Membrane Technical Data Sheet & BBA Certificate Omega Lining Solutions Method Statement Verification Proforma – Template GeoDyne Conditions and Limitations

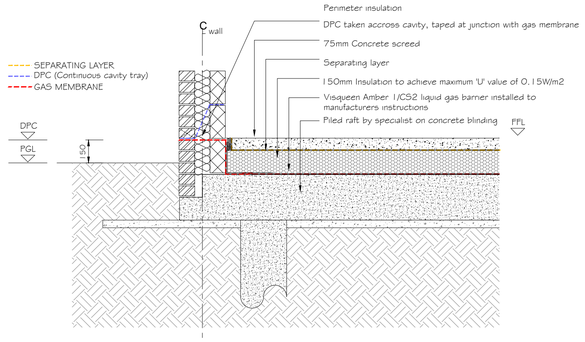
Verification approach - Visual Inspections

- Ground gas precautions to be installed and verified in accordance with Geodyne RMS
- All dwellings to have a well installed and verified low permeability proprietary gas resistant membrane validated by a third party and conforming to the requirements of Table 7 of BS8485 details of which are to be agreed with the local authority.
- Membrane to be installed in accordance with an agreed method statement prepared by the installer.
- The membrane should be suitably lapped and sealed and should be extended across wall cavities and lapped with cavity trays to effectively exclude ground gases from the footprint of the proposed buildings.
- Gas protection measures are to be installed in accordance with the requirements of CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gas' (2014).
- Gas protection measures are to be installed by a suitably qualified & experienced specialist contractor in a quality controlled/quality assured manner.
- Membrane to be suitably robust to withstand construction process and should be suitably protected following installation and inspection to minimise damage.
- Installed gas protection measures should be visually checked and verified by the installer and an appropriate third party.
- The verifier should check adherence to the agreed specification and visually inspect key areas, such as membrane integrity, seals at pipe penetrations and corner details.
- Defects must be corrected and works rechecked before final 'sign-off' reporting.
- All reports should include the materials used, visual inspection of the joints, visual inspection of the seals around penetrations, records of any deviation from the construction drawings, records of any non-compliance and corrective action taken, the verifier's signature and photographs as supporting evidence.

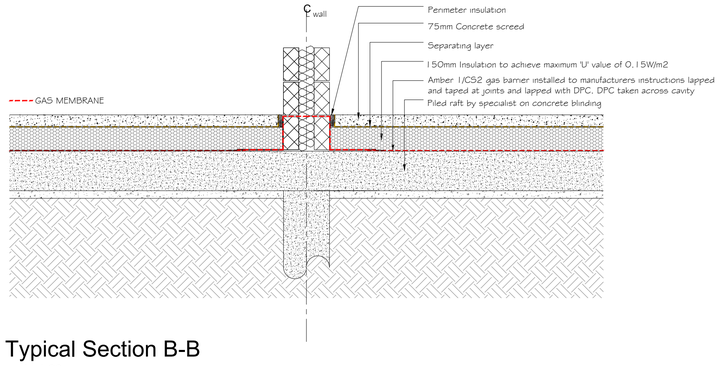


ALL WORKS IS TO BE IN STRICT ACCORDANCE WITH SPECIALIST MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS.

IN ALL CIRCUMSTANCES, THE MEMBRANE SHOULD BE PROTECTED AS SOON AS POSSIBLE AFTER VERIFICATION TO PREVENT FUTURE DAMAGE



Typical Section A-A
scale 1:20



Typical Section B-B
scale 1:20

Ground Gas Regime: Characteristic Situation CS2

- Hydrocarbons vapours and nuisance odours from localised hydrocarbon impacted soils.
- Gas protection measures required to only plots 1-3
- Minimum gas protection score for the plots is 3.5 points (Table 4 of BS 8485:2015)
- The predicted points score under Table 7 of BS 8485:2015 is
  Cast in-situ monolithic reinforced raft
  with minimal penetrations - 1.5 points
  Gas membrane on top of raft slab - 2.0 points

GAS MEMBRANE

JUTA GP1 Gas Barrier, or similar approved, to be installed in accordance with manufacturers details.

GAS PRECAUTIONS

Gas Precautions (CS2) to be installed to plots 1-3 only.

- Provision of a well installed and verified low permeability proprietary gas resistant membrane.
- The membrane should have proven resistance to potential hydrocarbon vapours and nuisance odours from the localised hydrocarbon impacted soils.
- The membrane should be suitably lapped and sealed and should be extended across wall cavities and lapped with cavity trays to effectively exclude ground gases / hydrocarbon vapours and nuisance odours from the footprint of the proposed buildings. The membrane should be inspected by a third party in accordance with the requirements of CIRIA C735.
- The membrane must be suitably robust to withstand the construction process and should be suitably protected following installation and inspection to minimise damage during construction.
- Service penetrations through the membrane should be kept to a minimum and should be suitably sealed to the membrane. Where the service penetrations (typically 150mm pipes) are to be used as ducting for smaller service pipes (e.g. water, electricity or gas supply etc.) an appropriate method of sealing the smaller pipes within the ducting should be adopted (such as closed cell expanding foam), to minimise the risk of the ducting acting as a conduit for ground gases to enter the dwellings.

Rev.	Date	Description

ASHWOOD HOMES
1 Goodison Road, Lincs Gateway Business Park, Spalding, Lincs, PE12 6FY **T: 01406 490590**

PROJECT:
Proposed Residential Development at Balmoral Way Phase 2

DRAWING:
Gas Membrane Details

SCALE: 1:500@A1 DRAWN: JE

DATE: JULY.2022 REVISION: /

DRAWING No:
075-GMD-01



GROUND GAS PROTECTION
GP®5 TECHNICAL DATA SHEET

JUTA | TITANTECH®

GP®5

GP®5 gas barrier is a multi-layer composite of virgin polyethylene (PE) giving exceptional resistance to the passage of ground gas and organic vapours. It also acts as a high performance DPM.

Thickness	0.4 mm
Width	Various m
Length	Various m
Weight	400 g/m²

TITANTECH®
For developers of brownfield and contaminated sites the TITANTECH® family of products represent a major step forward in safeguarding projects against gaseous and chemical contamination.

GP®5 is suitable for the following applications:

- Carbon dioxide and methane affected sites in accordance with BS 8485:2015 + A1:2019 & NHBC
- Radon affected sites in accordance with BRE211:2015
- Damp protection in accordance with Building Regulations Part C
- Low level VOC contaminated sites (site specific assessment required)

Handling

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

Installation

GP®5 should be installed in accordance with the product installation guidelines, and in accordance with BS 8485:2015.

BBA

CE UK CA

GROUND GAS PROTECTION
GP®5 TECHNICAL DATA SHEET

GP®5

Feature	Characteristics	Test Method	GP®5
Physical Properties	Thickness	EN 1849-2	0.4 mm
	Width	EN 1849-2	Various m
	Length	EN 1849-2	Various m
	Weight	EN 1849-2	400 g/m^2
Hydraulic Press	Resistance to Water Penetration	EN 1928 (A)	Pass
Mechanical Properties	Resistance to Static Load	EN 12730	> 20 kg
	Tensile Strength (MD)	EN 12311-2 (A)	> 300 N/50mm
	Tensile Strength (CMD)	EN 12311-2 (A)	> 300 N/50mm
	Resistance to Tearing (Nail Shank) MD	EN 12310-1	> 230 N
	Resistance to Tearing (Nail Shank) CMD	EN 12310-1	> 230 N
	Impact Resistance	EN 12691-B	500 mm
	Puncture Resistance	ASTM D 4833	> 160 N
	Puncture Resistance	EN 12236	1.60 kN
	Reaction to Fire	EN 13501-1	E
Vapour Permeability	Methane Permeability	BS EN ISO 15105-1	0.12 ml/m^2/day/atm
	Carbon Dioxide Permeability	BS EN ISO 15105-1	1.53 ml/m^2/day/atm
	Hydrogen Permeability	BS EN ISO 15105-1	68.7 ml/m^2/day/atm
	Benzene Permeability	BS EN ISO 15105-2	0.41 ml/m^2/day
	Oxygen Permeability	BS EN ISO 15105-2	<3 ml/m^2/day
	Radon Permeability	K124/02/95	1.0 x 10^{-12} m^2/s
Fuel Vapour Permeability	Petrol	BS EN ISO 15105-2	(ave.) 3.4 x 10^{-13} /mol/(m^2.s.Pa)
	Diesel	BS EN ISO 15105-2	(ave.) 3.4 x 10^{-13} /mol/(m^2.s.Pa)
Durability	Durability Watertightness After Artificial Ageing	EN 1928	Pass
	Durability Watertightness Against Chemicals	EN 1928	Pass
Compliance and Certification	CE Mark - EN 13967:2012		
	NHBC Standards Compliant		
	BS 8485:2015 + A1 2019 Accordant		

JUTA UK

Please contact JUTA UK Directly for more information on GP®5

Storage

Rolls of GP®5 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.

GROUND GAS PROTECTION
GP®5 TECHNICAL DATA SHEET

GP® 5

JUTA UK

Please contact JUTA UK Directly for more information on GP®5

Jointing and Sealing

It is recommended GP®5 can 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. GP®5 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

- GP® DPC
- GP® Tape
- GP® Self Adhesive Membrane (SAM)
- GP® Primer
- GP® Top Hats and Preformed Corners
- GP® Protection Fleece
- GP® Void Vent (24/40mm)

Juta UK Ltd
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Church Road
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Tel: 01772 754177
e-mail: info@juta.co.uk
website: www.juta.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
20/5728
Product Sheet 7

JUTA GAS-RESISTANT AND DAMP PROOFING MEMBRANES

GP5 GAS BARRIER



This Agrément Certificate Product Sheet(1) relates to the GP5(2) Gas Barrier, for use as a multilayer thermoplastic gas barrier and damp-proof membrane in concrete ground floors, above or below slabs 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'.
(2) GP is a registered trademark.

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 product, including joints, will restrict the passage of moisture into the floor structure (see section 6).

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

Resistance to damage — the product has satisfactory 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 product 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 incorporated (see section 11).

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: 26 October 2022

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.

Regulations

In the opinion of the BBA, the GP5 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:		The product can contribute to a structure satisfying the conditions of this Requirement. See sections 7.1 and 7.2 of this Certificate.
Requirement:	**C2(a)**	**Resistance to moisture**
Comment:		The product, including joints, will enable a floor to satisfy this Requirement. See section 6 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Fitness and durability of materials and workmanship**
Comment:		The use of the product satisfies the requirements of this Regulation. See section 11.1 and the *Installation* 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:		When properly installed in a correctly designed structure, the product forms an effective barrier to the movement of radon, methane and carbon dioxide within the ground-floor slab, enabling compliance with 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[(1)(2)] and 3.2.2[(1)(2)]. See sections 7.1 and 7.2 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product, including joints, will enable a floor to satisfy the requirements of this Standard, with reference to clauses 3.4.2[(1)(2)], 3.4.4[(1)(2)] and 3.4.6[(1)(2)]. See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to satisfying 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(1)(a)(i)**	**Fitness of materials and workmanship**
Comment:	**(iii)(b)(i)**	The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.

Regulation:	**26(1)(b)(2)**	**Preparation of site and resistance to dangerous and harmful substances**
Comment:		The product can contribute to a construction satisfying the requirements of this Regulation. See sections 7.1 and 7.2 of this Certificate.
Regulation:	**28**	**Resistance to moisture and weather**
Comment:		The product, including joints, will enable a floor to satisfy this Requirement. See section 6 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 sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, the GP5 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*.

UKCA and CE marking

The Certificate holder has taken the responsibility of UKCA and CE marking the product in accordance with EN 13967 : 2012.

Technical Specification

1 Description

1.1 The GP5 Gas Barrier is a multilayer polyethylene membrane (with 7 layers in total).

1.2 The product is available in dark blue/silver colour as standard and has the nominal characteristics shown in Table 1.

Table 1 GP5 Gas Barrier – nominal characteristics

Thickness (mm)	0.4
Roll length (m)	400
Roll width (m)	2 or 4
Mass per unit area ($g \cdot m^{-2}$)	400
Impact resistance (mm)	500
Tensile strength (N per 50 mm)	
MD and CD	> 300
Elongation (%)	> 550
Water vapour transmission ($g \cdot m^{-2} \cdot day^{-1}$)	0.11-0.18
Watertightness (60 kPa)	Pass
Nail tear (N)	
MD and CD	> 230
Resistance to static loading (kg)	> 20

1.3 Ancillary items for use with the product include:

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

1.4 The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- 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 — cuspated high-density polyethylene (HDPE) drainage core, with a non-woven polypropylene geotextile separator/filter bonded to one side
- GP Void Vent 40 — cuspated 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 product is manufactured by extrusion and laminating processes.

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 BS EN ISO 9001 : 2015 by TÜV Austria (Certificate 010150310/02).

3 Delivery and site handling

3.1 Rolls are wrapped in polythene film. Each roll bears a label including product name and grade, material specifications, ID number, batch number and date of manufacture.

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

3.3 The Certificate holder has taken the responsibility of classifying and labelling the product under the *CLP Regulation (EC) No 1272/2008* on the *classification, labelling and packaging of substances and mixtures.* Users must refer to the relevant Safety Data Sheet(s).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the GP5 Gas Barrier.

Design Considerations

4 Use

4.1 The GP5 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 product 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.

4.4 The product should be protected after installation in accordance with the Certificate holder's instructions.

5 Practicability of installation

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

6 Resistance to water and water vapour



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

6.2 The product complies with the minimum sheet thickness detailed in the documents supporting the national Building Regulations.

7 Resistance to underground gases



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

7.2 Measured gas permeability/diffusion values on the unjointed membrane for a range of underground gases are given in Table 2.

Table 2 Gas permeability and radon diffusion coefficient of GP5

Gas	Method	Result
Methane(1)	BS ISO 15105-1	0.12 $ml \cdot m^{-2} \cdot day^{-1} \cdot atm^{-1}$
Carbon dioxide	BS ISO 15105-1	1.53 $ml \cdot m^{-2} \cdot day^{-1} \cdot atm^{-1}$
Radon	Czech Technical University in Prague (method K124/02/95) (method C of ISO/TS 11665-13)	9.8×10^{-14} $m^2 \cdot s^{-1}$

(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 $ml \cdot m^{-2} \cdot day^{-1} \cdot atm^{-1}$.

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

8 Resistance to damage

8.1 The product 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 either below or on the product's surface prior to and during installation of the protective layer, the product will not be damaged by the normal foot traffic and other loads associated with the installation of the product.

9 Underfloor heating

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

10 Maintenance

As the product is confined under concrete and has suitable durability (see section 11), maintenance is not required. However, any damage occurring before enclosure must be repaired (see section 15).

11 Durability



11.1 The product 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 flooring construction in which it is incorporated.

11.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the product.

12 Reuse and recyclability

The product contains polyethylene, which can be recycled.

Installation

13 General

13.1 The GP5 Gas Barrier must be installed and fixed in accordance with the Certificate holder's instructions, the relevant clauses of BRE Report BR 211 : 2015 and BS 8485 : 2015, and this Certificate.

13.2 Particular care should be taken to ensure that the product is incorporated into the building as part of a complete system to prevent the ingress or build-up of contaminants; this may require the use of additional methods such as sumps and ventilation.

13.3 The product 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 product 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 All surfaces must be dried thoroughly prior to joining.

14.5 Joints can be installed using butyl tape; however, the chemical compatibility must be checked. A strip of the tape is unrolled over the membrane with its nearest edge 50 mm from the 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 Where doubt exists over the suitability of the butyl tape, the membrane can be welded using hot air or wedge-welding equipment. All laps and junctions must be overlapped by 100 mm. The weld width must be a minimum of 50 mm.

14.7 Before welding work is carried out, trials must be completed to determine the 'operating window' for the welding equipment, materials and ambient conditions. Typically, the operating window will be between 180 and 240°C at a rate of 3 m.min. In case of doubt, the Certificate holder should be consulted.

14.8 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.

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

14.10 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 product during construction.

14.11 The product's installation should be subject to third-party independent validation, in accordance with BS 8485 : 2015.

15 Repair

Any damage to the product must be repaired using a patch of the product, 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 installation should be subject to third-party validation in accordance with BS 8485 : 2015.

Technical Investigations

16 Investigations

16.1 An evaluation was made of the results of independent test data in relation to:

- visible defects
- thickness
- mass per unit area
- methane gas transmission
- carbon dioxide gas transmission
- radon gas diffusion coefficient
- watertightness (after ageing and after exposure to chemicals)
- resistance to static loading
- resistance to dynamic impact
- tensile strength and elongation
- resistance to tearing (nail shank).

16.2 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 ISO 9001 : 2008 *Quality management systems — Requirements*

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*

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*

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.

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METHOD STATEMENT

Project Information			
Project Title	Balmoral Way	Project No.	131/GM/001
Project Address	Balmoral Way	Postcode	PE12 8LY
	Holbeach		
Start Date	22/11/2022	Duration	1 Day

Client Information	
Contractor	Quinn Groundworks
Site Contact	Chris Devane / Carl Lawe
Number	07590 950302 / 07444 754851

Omega Information	
Project Contact	Ricky
Number	07817634284
Email	ricky.c@omega-ls.co.uk

1.0 Introduction

This method statement has been prepared to describe the procedures used during general contract works

This method statement must be checked against and using all the latest tender issue drawings and information available.

This document should be read and used in conjunction with the current project risk assessments. An indication of approval of this document, from the Client or client's agent (as applicable), will be required prior to commencement of the works described herein.

Prior to project start-up, Company management will decide on the best sequence of works, and any area / phasing to be incorporated into the works programme.

1.1 Sequence of Works

This project consists of the installation of gas membrane to the Balmoral Way, Holbeach project.

The project will be carried out using JUTA GP5 Gas Barrier & GR SAM self-adhesive with the use of small handheld tools, none of which require vibration surveillance or noise assessments.

This method statement has been read and understood by: -

Site Operative Name	Signature

2.0 Health & Safety considerations and precautionary measures

a. Omega Lining Solutions are always committed to the provision of a safe working environment, and to this end undertake to suitably train and advise staff and operatives as befits their role in a project. In addition, the company provides, at no cost to the operative, all such protective material and equipment as is necessary to ensure their safety whilst employed by the company.

b. It is the principal requirement of all contracts that the works and all constituent elements shall comply with the requirements of current health and safety legislation and approved method statements. The details of this statement are supplemental to the articles of current Health and Safety legislation in that they are company specific. However, should there be a conflict of either content or implication, the legislative requirements shall prevail, and site practices would be revised to reflect this. Further or revised statements may be required where such an occasion would involve the incidence of an unassessed risk.

c. This statement shall be issued to operatives and all affected parties so as to inform and advise of the perceived risks and the prescribed preventative measures to be adopted.

d. This document will be further communicated to the workforce by means of a toolbox talk and shall be signed by each operative at induction on sheet 2 as acceptance of their knowledge and understanding of the works.

e. When conducting inductions or 'tool-box' talks it is important to ensure that all relevant additional information regarding site or operational restrictions or hazards are suitably relayed to the operatives involved in the works.

f. It is imperative that all parties are aware of their personal responsibility with regard to their own and others' safety and that they conduct themselves in a manner most likely to fulfil this condition.

g. The works shall be managed and controlled in such a manner as to minimise or, where possible, eradicate the risk to operatives, interfacing trades or members of the public.

h. All supervisors, operatives, appointed persons, and plant operators shall be trained and certified in accordance with current legislation. Records of such training shall be maintained. Such records will be updated as further training courses are conducted.

i. Environmental restrictions shall be adhered to in respect of the management of controlled waste, noise, dust, and nuisance. Prior, formal, and detailed notices shall be issued where an element of work is anticipated to materially disrupt or affect normal environs.

j. All documentation regarding health and safety, i.e., risk and COSHH assessments, statements etc. are to be retained on site and be always made available for inspection.

k. Changes and unforeseen circumstances may occur throughout the project. In the event of any significant change, the statement should be reviewed and revised where necessary.

l. All plant and lifting equipment are to have been inspected prior to delivery and be accompanied by the required documentation. Items are to be confirmed as being suitable for the intended use and site checks will be performed to the manufacturer's/supplier's recommendations.

m. Open excavations shall be fenced off using suitable and sufficient barriers if to be left open whilst unattended to minimise the risk of other operatives falling into it.

n. ensure that **all** 110v equipment has an in-date PAT test. Tested every 3 months.

o. Minimum P.P.E of Hard Hat (BS EN 397), High Visibility vest, Steel capped boots (BS EN 20345) & Gloves (BS EN 388 task specific) gloves and glasses to be worn at all times.

p. All Omega Lining Solutions operatives carry a current and valid CSCS pass requirement.

q. Daily meeting for site foreman to attend when on site with daily diary & briefing to be fulfilled.

r. Scissors are the primary cutting tool and will be stored suitably when not in use. Retractable bladed Stanley blades used and stored appropriately when not in use in conjunction with the task specific BSE EN 20345 gloves.

s. Hot Works to be issued daily if required and signed off minimum of 1 hour after work completion. 2 extinguishers to be on hand and specific to materials used.

t. Nearest Hospital to be outlined in site induction for note of staff.

u. Any prior health conditions will be made aware to site staff prior to commencing on site at Induction.

v. Emergency contact details Ricky Cooper 07817634284/0115 9446949 (Company Director)

w. Generators will be used as main power source with suitable plant nappy supplied for running/refuelling.

x. The operation will take place at ground level.

3.0 Operations

This project is for the installation of a specified system to be carried out in accordance with our standard working procedures. The designer's specification and current legislation at the site.

3.1 Site set-up & planning

a. In agreement with the client, identify site/work area perimeter, and areas for dedicated offices, containers, welfare facilities, material placement and bricks to be supplied to weigh down membranes installed.
b. Confirm full issue of construction status drawings have been received.
c. Obtain, check, and agree the site setting out control data.
d. Identify service / works coincidence and investigate or isolate where necessary.
e. First Aid box in site office. Staff to sign in/out on entering and leaving site

3.2.1 Loading / unloading / logistics

Identify dedicated pedestrian routes within the works section, and where required, provide a physical barrier from works and plant, using fixed barriers. Omega Lining Solutions site hours are 8.00am to 5.00pm

3.2.2 Preparation

a. The area to which the membrane is to be installed must be clean and free from all debris and sharp objects. Stones, steps, and protrusions/edges must be of a smooth finish and levelled with the appropriate materials.

b. Where a smooth surface cannot be achieved a protective geotextile membrane can be used prior the placement of the final membrane.

c. All structural works i.e., concrete, brick/block work, cavity fill, and column encasement must be complete prior to the commencement of any placement of the membranes. Once membranes are placed and sealed, these seals cannot be broken.

d. A test weld will be completed to find the right temperature and speed for the membrane being used; this will also consider the weather conditions.

e. The test weld will then be cut up and tested by the supervisor on site to make sure the weld is sufficient.

3.2.3 Placement of membrane

a. The rolls of gas membrane weigh over 20kg and will be carried from the van to the place of work by two or more operatives. Or with mechanical assistance where required/possible.

b. We propose to use a complete line-out system on this project. As outlined below

c. All penetrations will be cut and fabricated in situ and a self-adhesive membrane used for the forming and sealing of corners or any irregular penetrations. (As per standard sealing details).

d. It must be noted that poor weather conditions prevail i.e cold and wet, then a seal will be achieved by heat and pressure.

e. The first operation will be to check preparation and sign off subbase acceptance form.

f. The second operation is to carry out the complete line-out. All corners, steels, pipe entries and perimeter etc will be sealed as required.

g. The third operation will be to lay the gas membrane and seal to perimeter membrane. Where a perimeter membrane is not present a self-adhesive retro fit system will be applied. The membrane will be placed with an overlap of 100mm to the underside of the perimeter membrane (b) and welded together using a DEM-TECH PRO WEDGE or handheld hot air LEISTER welder. A hot works permit is required for the specified equipment and signed off 1 hour after completed works.

h. Specific requirements are needed for the sealing of pipes, and these must be adhered to: Pipe entries require a straight pipe, no collars, or bends and at least 150mm of pipe protruding through from floor levels.

i. Self-adhesive membranes will be applied to previously primed area where applicable after a 2-hour curing time.

j. A space of 100mm between adjacent pipe or other obstructions must be achieved to affect a gas tight seal to all pipes. All outside diameter pipe sizes must be provided prior to the commencement of the works.

k. All joints will be lapped, and the membrane is self-adhesive and requires only rolling with a small hand roller.

l. In cold weather the membrane will be sealed as at (d)

m. In areas that membranes will be exposed for jointing at a later date, the edges should be protected to minimise damage. This is the responsibility of the Principal Contractor to ensure the protection of the membrane at all times.

3.3 Repair or damage

a. The area of damage should be clean and dry. For areas of damage of less than 150mm in diameter an adhesive patch will be cut at least 200mm larger than the damage.
b. Backing paper is peeled from the patch and placed over the damaged area with an even pressure applied to ensure a good seal and adhesion.
c. A membrane patch will be hot air welded using a LEISTER welder for double protection

3.4 Final works

a. At the end of each stage, the site supervisor will inspect works to ensure compliance with drawings, specification, etc.
b. Offer completed works for inspection as required by relevant approval bodies, engineer etc.
c. A handover certificate will be issued by Omega Lining Solutions in accordance with their standard procedures.

3.5 Additional Points

a. The site should be ready for Omega Lining Solutions to commence works at the agreed time. Any waiting time will be recorded on a day work sheet by the appointed foreman on site and agreed with the Principal Contractors Site Manager. Charges will apply.

b. On completion of the works and the issuance of the hand over certificate the protection of the membrane becomes the sole responsibility of site and Omega Lining Solutions can accept no responsibility for any failure of the membrane due to damage by 'others.

c. If you need to contact Omega Lining Solutions contact details are below.

Omega Lining Solutions Limited
Lyndhurst
1 Cranmer Street
Long Eaton
NG10 1NJ
Mob: 07817634284
Tel: 0115 944 6949
E-mail enquiry@omega-ls.co.uk

INSPECTION OF GAS PROTECTION MEASURES

Site name	Balmoral Way, Holbeach	Client	Ashwood Homes
Project number	D41012	Date	
Plot number		Visit by	

In general accordance with Appendix A5 of CIRIA C735 'Good practice on the testing and verification of protection systems for buildings against hazardous ground gas' (2014)

No.	Item	Comments (see notes)
1	Gas Membrane	
1.1	Condition of sub-grade and underside of gas membrane	
1.2	Gas membrane type	
1.3	Gas membrane condition	
1.4	Joining tape product	
1.5	Lapping design	
1.6	Laps, welds, joints and seals	
1.7	Service entries seals	

No.	Item	Comments (see notes)
2	Passive Venting	
2.1	Sub-floor void	
2.2	External wall airbricks	
2.3	Internal sleeper walls	
2.4	External vent trenches/ducts	
3	Active Venting	
3.1	System details	

Installers Name & Company:	NVQ Level 2 Qualified?		
	Yes	No	Ongoing
	Yes	No	Ongoing
	Yes	No	Ongoing

Areas Unavailable for Inspection	Material Batch Numbers
Photographic Evidence Requested from Site Manager/Installer YES/NO	

Non-Conformance/Corrective Measures Sheet Completed?	Yes	No

The gas protection measures inspected:		
	A – Are acceptable and comply with the specification	
	B – Are acceptable but attention is drawn to issues related to item No.	
	C – Are not acceptable due to the issues related to item No.	

Additional Notes -

Photographs, As A Minimum & Where Applicable (✔)								Test Weld & Material Samples	
Overall Plot / Area		Membrane Joint / Welds		Corner Details		Defects ALL		Test Weld Obtained	YES/NO
Stanchions		Air Bricks / Venting		Service Pipe Seals		Repairs ALL		Material Samples Obtained	YES/NO

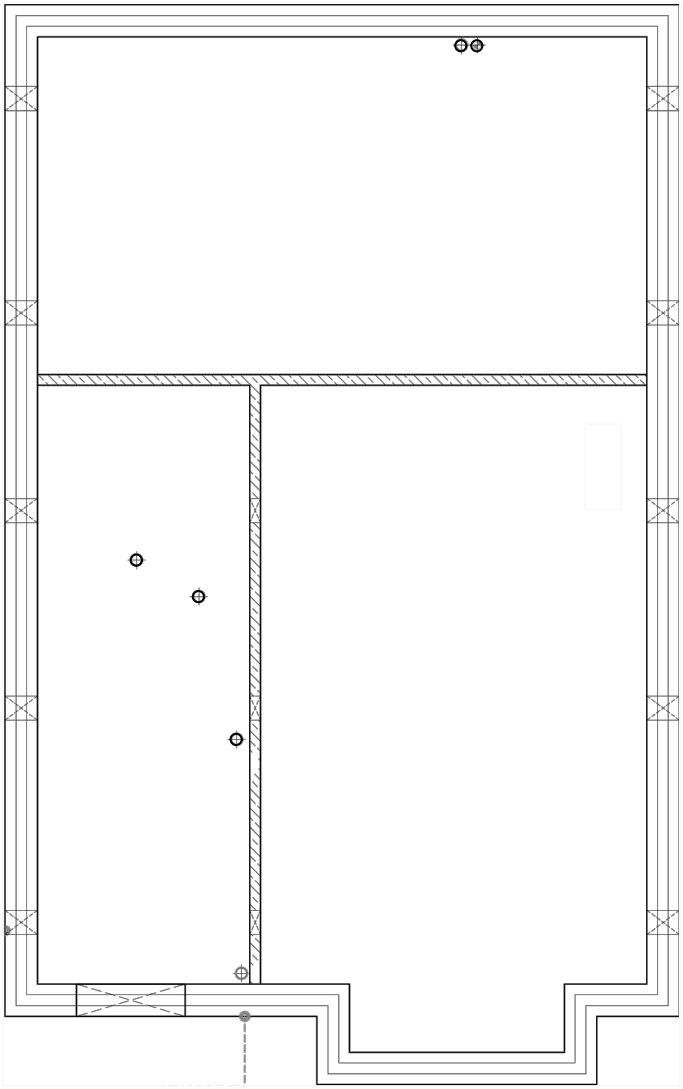
Name	Signature	Date

NON-CONFORMANCE/CORRECTIVE MEASURE SHEET

Site Name	Balmoral Way, Holbeach	Project No.	D41012	Client	Ashwood Homes

Ground Floor Layout (Identify location of Non-Compliance on Layout

Plot No 1



Ref No.	**Description**: Weld failure (**WF**) Puncture (**P**) Corner seal failure (**CSF**) Service penetration failure (**SPF**) Tear (**T**) Cut (**C**) Patch failure (**PF**) Other (**O**) - Please detail	**Repair:** Patch (**P**) Reweld (**R**) Other (**O**)	**Photo Ref.**	
			Defect	**Repair**
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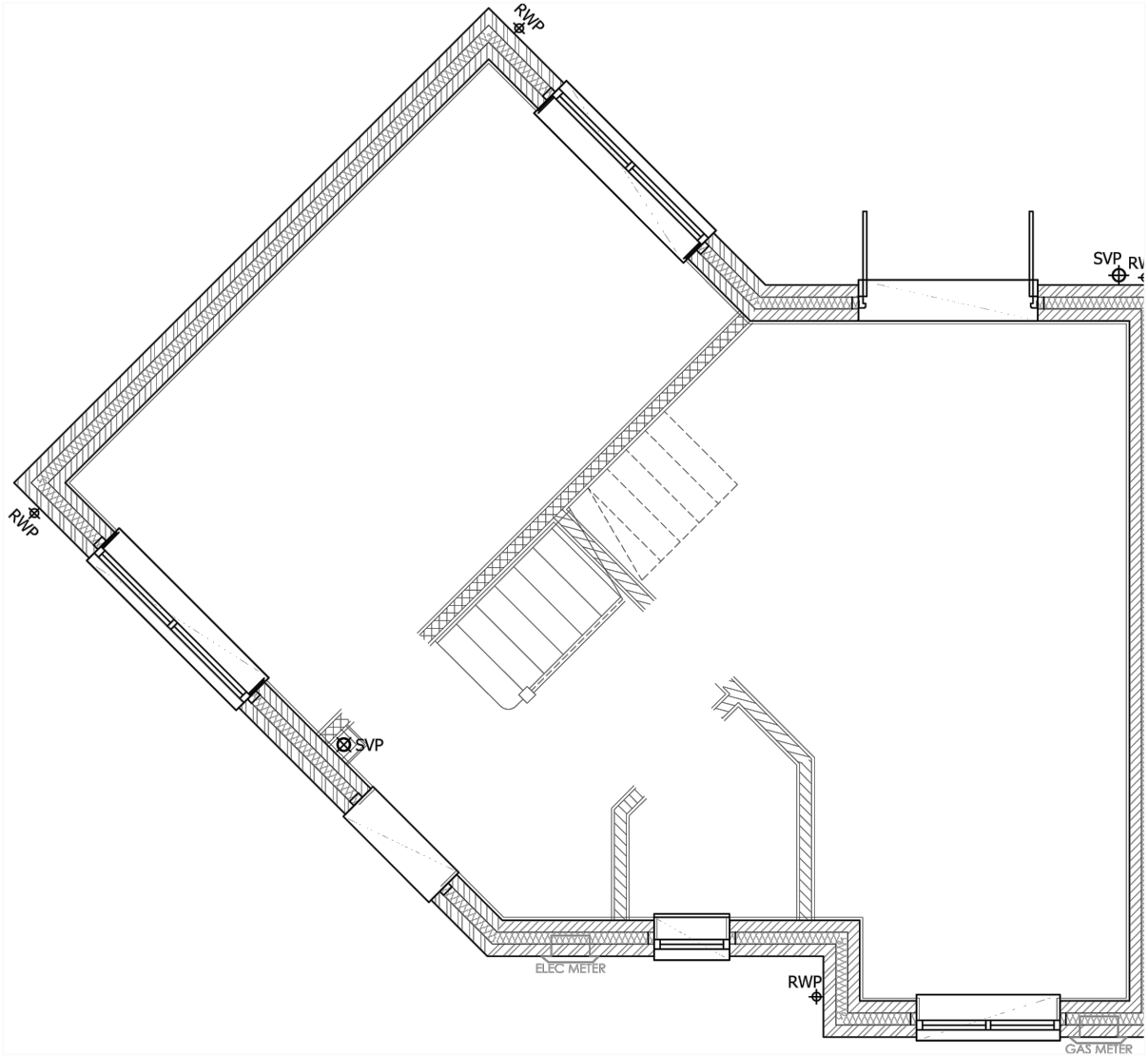
Date of Initial Inspection		Initial Inspection Visit By		Date of Re-Inspection		Re-Inspection Visit By	

NON-CONFORMANCE/CORRECTIVE MEASURE SHEET

Site Name	Balmoral Way, Holbeach	Project No.	D41012	Client	Ashwood Homes

Ground Floor Layout (Identify location of Non-Compliance on Layout

Plot No 2



Ref No.	**Description**: Weld failure (**WF**) Puncture (**P**) Corner seal failure (**CSF**) Service penetration failure (**SPF**) Tear (**T**) Cut (**C**) Patch failure (**PF**) Other (**O**) - Please detail	**Repair:** Patch (**P**) Reweld (**R**) Other (**O**)	**Photo Ref.**	
			Defect	**Repair**
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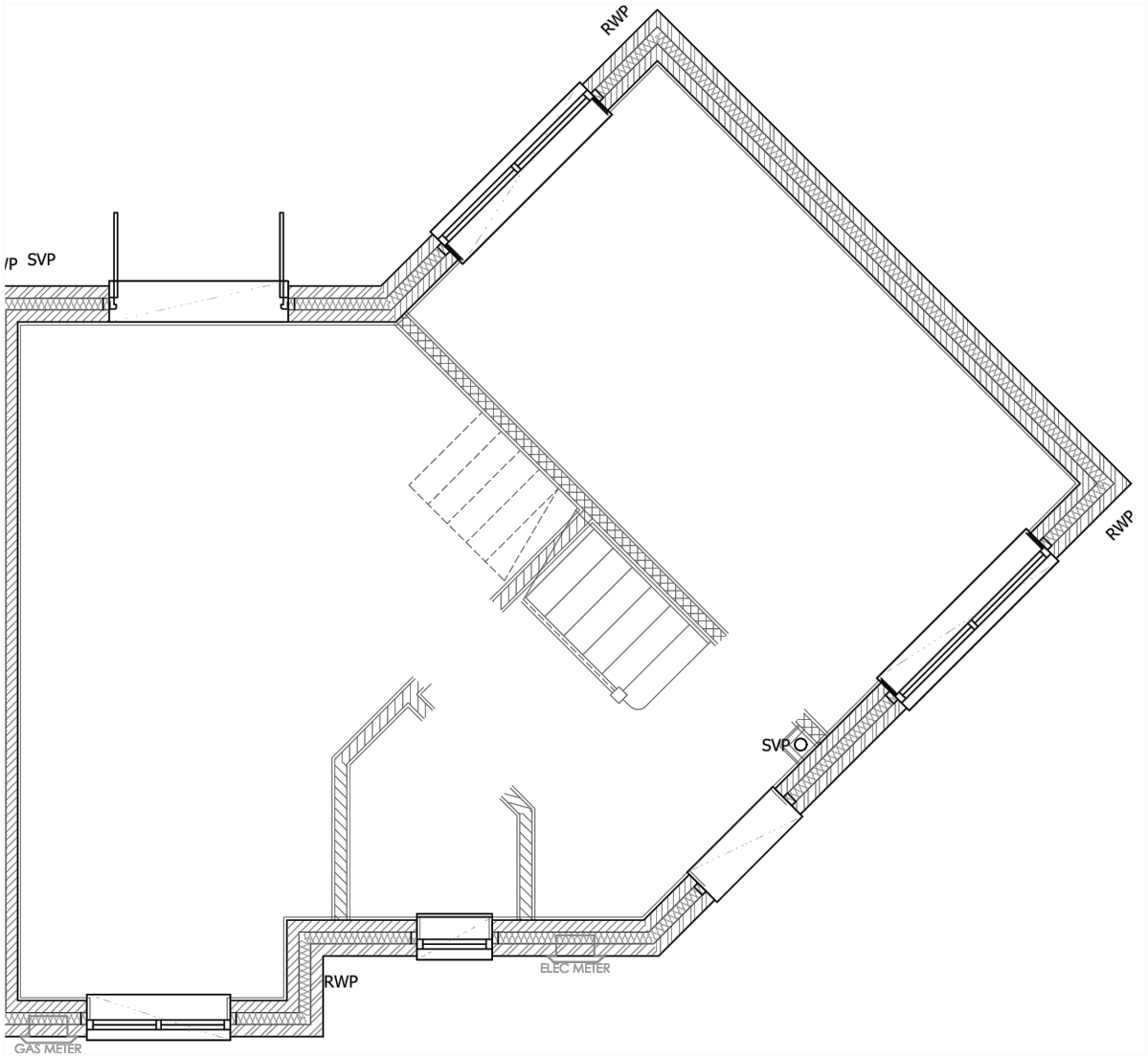
Date of Initial Inspection		Initial Inspection Visit By		Date of Re-Inspection		Re-Inspection Visit By	

NON-CONFORMANCE/CORRECTIVE MEASURE SHEET

Site Name	Balmoral Way, Holbeach	Project No.	D41012	Client	Ashwood Homes

Ground Floor Layout (Identify location of Non-Compliance on Layout

Plot No 3



Ref No.	**Description**: Weld failure (**WF**) Puncture (**P**) Corner seal failure (**CSF**) Service penetration failure (**SPF**) Tear (**T**) Cut (**C**) Patch failure (**PF**) Other (**O**) - Please detail	**Repair:** Patch (**P**) Reweld (**R**) Other (**O**)	**Photo Ref.**	
			Defect	**Repair**
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Date of Initial Inspection		Initial Inspection Visit By		Date of Re-Inspection		Re-Inspection Visit By	

Conditions & Limitations

Phase I Desk Studies

1. Works undertaken to provide the basis of the Phase I Desk Study report comprise a review of information available from a number of sources/parties (potentially also including the Client) together with a walk over of the site (where applicable and included within the quotation). The opinions given in the Phase I Desk Study are based on the information available from third parties/sources that has been obtained within the available timeframe. GeoDyne Limited assumes all third party information to be true and correct and therefore cannot accept liability for the accuracy of such information supplied.

2. Should additional information become available that may affect the comments and opinions made within the Phase I Desk Study, GeoDyne Limited reserves the right to review such information and make modifications to comments/opinions as appropriate.

3. It should be borne in mind that a Phase I Desk Study collates available information to generate a conceptual model of the site. The actual geotechnical and environmental considerations can only be fully quantified by intrusive investigation works to confirm the accuracy of the conceptual site model.

Phase II Intrusive Investigations

1. Our quotation assumes that access to the site will be arranged by others at no cost to ourselves.

2. We have assumed that free access is available throughout to the entire site and that works can be undertaken during a single mobilisation. Where restricted access is encountered, or where additional unscheduled mobilisations are required, additional costs may be incurred to the client.

3. We have assumed that all available information relating to buried services will be supplied by the Client at no cost to ourselves. No responsibility will be accepted for damage to underground services that have not been brought to our prior attention by the Client.

4. All excavations/boreholes will be backfilled with compacted arisings upon completion, with any excess arisings left proud of ground levels. Excess arisings will not be removed from the site unless specifically requested by the Client. Where we are requested to remove excess arisings, all associated costs will be passed to the Client.

5. We will attempt to leave the site in a clean and tidy state, however, it must be understood that some disturbance of the site is unavoidable during intrusive works.

6. Exploratory holes are positioned approximately on site by GeoDyne Limited. Should the client require precise locations of all exploratory points, additional fees will be incurred. It must be borne in mind that backfilled trial pits can create ‘soft spots’, therefore, should the Client wish to designate ‘no dig’ zones, for example under the footprint of proposed structures, these must be brought to our attention prior to commencement of works.

7. Groundwater observations relate to conditions encountered at the time of investigation. It must be understood that groundwater levels may vary as a result of recent climatic conditions or seasonal variation.

8. Trial pits and boreholes examine only a small proportion of the total site area. No liability can be accepted for conditions not revealed in exploratory holes, particularly between positions. All extrapolations of available data are given in good faith.

Payment

1 Payment terms are strictly 28 days from the invoice date.

2 Prior to commencement of works, we require receipt of formal written instruction from the party accepting full financial responsibility for the work. In the absence of such an instruction, we would expect the instructing Consulting Engineers/Architects to accept full financial responsibility for the works.

3 Receipt of instruction to commence work shall be taken as acceptance and compliance of the foregoing conditions.

Liability

1. GeoDyne Limited offer £5,000,000.00 Professional Indemnity Insurance (in aggregate over the year). This shall be the limit of our liability for works undertaken. No individual liability shall be implied to, or accepted by, any employee for works undertaken for and on the behalf of GeoDyne Limited.