REMEDIATION STRATEGY

FOR

CHANGE OF USE OF FORMER PUBLIC HOUSE TO A SHOP (CLASS E) INCLUDING PART DEMOLITION, SINGLE STOREY EXTENSION & EXTERNAL WORKS

AT

THE BELL INN
33 CHURCH STREET
PINCHBECK
SPALDING
PE11 3UB

FOR

VENTURE BUSINESS SPACE

Project Ref: **THE BELL**

Issue: **01**

Date: **OCTOBER 2026**

Prepared By: **A.D. Hayton**
BEng (Hons) CEng MICE MCIHT FIHE

Monocle
184 Ferensway
Hull
HU1 3UT
United Kingdom

Tel: **+44 (0) 1482 647138**
Email: ***andyh@allenbycommercial.co.uk***

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Report to be read in conjunction with the Phase I and Phase II Ground Investigations and Gas Risk Assessment prepared by SOLMEK[1,2,3].

1.0 INTRODUCTION

This Remediation Strategy is prepared by Allenby Commercial on behalf of Venture Business Parks.

The Remediation Strategy is intended to support discharge of Planning Condition 21 part iii.

The associated planning reference is H14-0523-26.

2.0 DESCRIPTION OF EXISTING SITE

The existing site comprises the former Bell Inn, and associated land of circa 1.45 acres.

The site fronts onto Church Street. At the rear of the site there is an area of amenity grassland formerly associated with the pub.

3.0 PROPOSED DEVELOPMENT

The proposed development comprises the change of use of the former public house to a shop (Class E), including part demolition and single storey rear extension.

4.0 SITE HISTORY

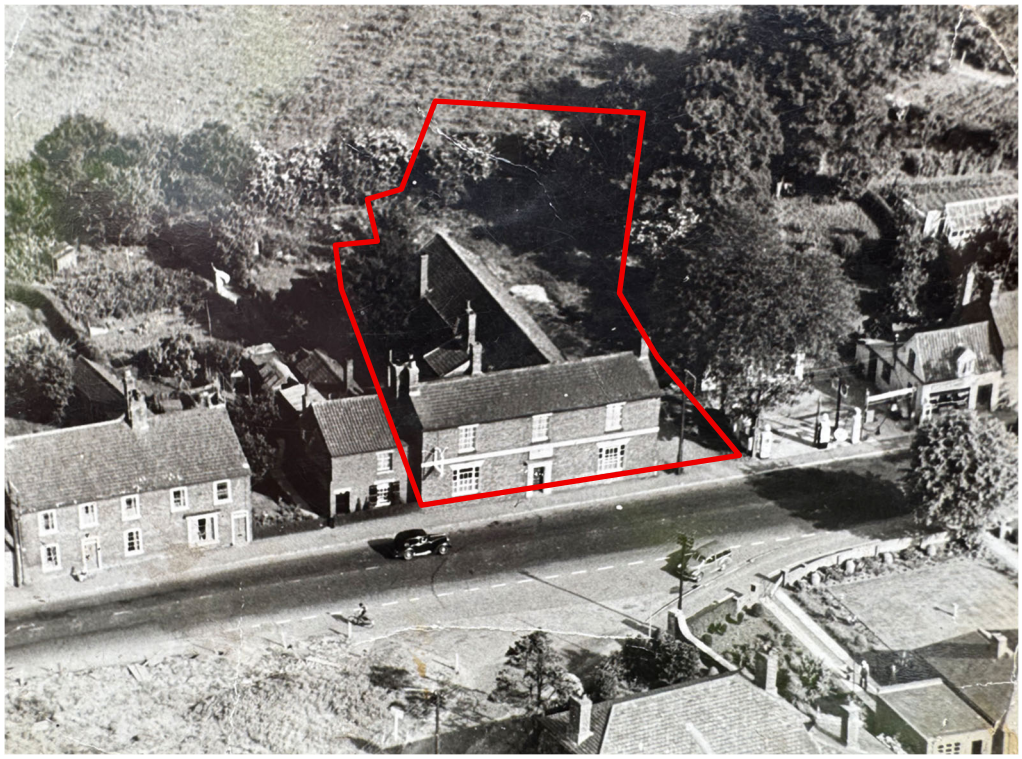
A summary of the historical land uses of the site is presented below (extracted from the Solmek Phase 1 Ground Investigation, dated July 2025)[1]

The earliest maps of 1887 show that the site was, and has remained, undeveloped former agricultural land, with the Bell Inn situated at the front of the site.

[1] SOLMEK Phase 1 Desk Study – July 2025. Report Reference M25-083

OS Map Edition	On-site Features	Off-site Features (within 500m)
1887 1:10,560 1888-1889 1:2,500	The site is shown to be mostly open with the Bell Inn located in the northwest of the site. A small building is shown to the southeast of main building.	A graveyard associated with St Mary's Church is located immediately south of the site as well as a smithy located 50m north of the site. Some residential development within 250m to the north of the site including schools and chapels. Road immediately adjacent to the west of the site labelled as church street.
1904 1:2,500	No significant change.	Continued residential development 100m to the north.
1906 1:10,560	Small building no longer shown on maps.	Graveyard to the south no longer marked on maps.
1956-1959 1:10,000	No significant change.	Land immediately west of the site now looks to have been developed with residential properties.
1968-1969 1:2,500	No significant change.	Filling station now located immediately southwest of the site. Significant development to the west and south of the site within 150m, including builders' yard 110m to the west and pond 150m to the south.
1971-1975 1:10,000 1973 (partial) 1:2,500	No significant change.	Significant residential development to the west and north of the site.
1982-1988 1:2,500	A drain is marked on the sites eastern border.	Smithy to the north no longer marked on the maps.
1990-1992 (partial) 1:10,000	No significant change.	Filling station no longer marked on maps.
1995 1:2,500	No significant change.	Builders yard to the west no developed into residential units.
2000 1:10,000	No significant change.	No significant change.
2006 1:10,000	No significant change.	No significant change.
2025 1:10,000	No significant change.	No significant change.
Aerial Photography Edition	On-site Features	Off-site Features (within 500m)
1999 1:2,500	Site is shown to be occupied by a large building in the northwest (Bell Inn) with an associated tarmac car park. The rest of the site looks to be a field, possibly an associated garden.	The site is shown to be surrounded by residential properties to the north and southwest, a church to the south and agricultural fields to the east.

Summary of Site History[1]



Aerial Photo of Site – Estimated to be 1950s.



Aerial Photo of Site –2021. © Google Earth

5.0 SUMMARY OF GROUND INVESTIGATIONS

Reference should be made to the SOLMEK Phase 2 Intrusive Ground Investigation[2] for full details of the geology encountered beneath the site/location of the proposed extension. In summary:

- 'Made ground' was encountered to depths of between 0.30mbgl (TP01) to 1.0mbgl (CP01).
- The made ground broadly consisted of clayey, gravelly topsoil (typical of worked agricultural land). Within the vicinity of the proposed extension, fill encountered was gravelly.
- Soft clay / silt with pockets of peat underlying the made ground and/or topsoil to circa 10m depth.
- Firm to stiff clay encountered beneath the soft cohesive deposits, proven to the base of the boreholes at 15.45m.
- Groundwater was encountered between 1.60m and 11.40m.
- Perched groundwater was noted between 2.10m and 19.60m.

6.0 CONTAMINATION ANALYSIS

2 made ground, 3 topsoil and 1 natural sample were tested, as follows:

- 6no Metals, semi-metals, non-metals, inorganic determinants
- 6no Speciated Polyaromatic Hydrocarbons (PAH's)
- 3no Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG)
- 6no Asbestos identification screenings

A summary of the results is presented below – with associated LQM/CIEH 'Suitable 4 Use Levels' (S4UL) thresholds based on residential land use (very conservative given the proposed commercial use).

No Asbestos fibres were recorded in any of the samples.

Determinand	Units	Number of Samples above Level of Detection	Minimum Recorded Level	Maximum Recorded Level	Residential with HGP Threshold Value	Number of Results Exceeding Threshold Value
Metals						
Cadmium	mg/kg	1	<0.1	0.4	190	0
Chromium	mg/kg	6	15	36	8600	0
Copper	mg/kg	6	12	29	68000	0
Lead	mg/kg	6	20	61	2300*	0
Mercury	mg/kg	1	<0.1	0.15	1100	0
Nickel	mg/kg	6	5.2	25	980	0
Zinc	mg/kg	6	35	110	730000	0
Semi metals and non metals						
Arsenic	mg/kg	6	7.6	19	640**	0
Boron	mg/kg	6	0.6	4.8	240000	0
Selenium	mg/kg	0	<0.2	-	12000	0
Inorganic chemicals						
Cyanide (Total)	mg/kg	0	<0.5	-	1580**	0
Sulphate (2:1 Water Soluble)	mg/l	6	24	1800	2000^	0
Other						
pH	pH	-	7.9	10.9	5.5^	0

* Category 4 Screening Levels, March 2014
** CLEA Software Version 1.06 (pH7 and 1%SOM)
^ EA Threshold Values
HGP Home Grown Produce

Summary of Inorganic Contamination Testing Results

No samples indicated raised levels of contamination above S4UL threshold values.

[2] SOLMEK Phase 2 Intrusive Ground Investigation – September 2025. Report Reference M25-083
[3] SOLMEK Ground Gas Assessment, July 2026. Report Reference M25-083

Determinand	Units	Number of Samples above Level of Detection	Minimum Recorded Level	Maximum Recorded Level	Residential with HGP Threshold Value at 2.5% SOM	Number of Results Exceeding Threshold Value
TPH Aliphatic Fractions						
Aliphatic (C5-C6)	mg/kg	0	<1	-	5900	0
Aliphatic (C6-C8)	mg/kg	0	<1	-	17000	0
Aliphatic (C8-C10)	mg/kg	0	<1	-	4800	0
Aliphatic (C10-C12)	mg/kg	1	<1	2.56	23000	0
Aliphatic (C12-C16)	mg/kg	0	<1	-	82000	0
Aliphatic (C16-C21)	mg/kg	1	<1	58.38	1700000	0
Aliphatic (C21-C35)	mg/kg	0	<1	-	1700000	0
TPH Aromatic Fractions						
Aromatic (C5-C7)	mg/kg	0	<1	-	46000	0
Aromatic (C7-C8)	mg/kg	0	<1	-	110000	0
Aromatic (C8-C10)	mg/kg	0	<1	-	8100	0
Aromatic (C10-C12)	mg/kg	0	<1	-	28000	0
Aromatic (C12-C16)	mg/kg	1	<1	17.02	37000	0
Aromatic (C16-C21)	mg/kg	2	<1	226	28000	0
Aromatic (C21-C35)	mg/kg	3	1.85	320.4	28000	0
Speciated PAH						
Naphthalene	mg/kg	1	<0.1	0.33	460	0
Acenaphthylene	mg/kg	2	<0.1	1.9	97000	0
Acenaphthene	mg/kg	2	<0.1	1.4	97000	0
Fluorene	mg/kg	2	<0.1	3.1	68000	0
Phenanthrene	mg/kg	3	<0.1	16	22000	0
Anthracene	mg/kg	3	<0.1	6.5	540000	0
Fluoranthene	mg/kg	4	<0.1	44	23000	0
Pyrene	mg/kg	4	<0.1	49	54000	0
Benzo[a]anthracene	mg/kg	3	<0.1	26	170	0
Chrysene	mg/kg	3	<0.1	27	350	0
Benzo[b]fluoranthene	mg/kg	3	<0.1	24	44	0
Benzo[k]fluoranthene	mg/kg	2	<0.1	13	1200	0
Benzo[a]pyrene	mg/kg	3	<0.1	32	35	0
Benzo[g,h,i]perylene	mg/kg	3	<0.1	20	4000	0
Dibenz(a,h)Anthracene	mg/kg	2	<0.1	4.9	3.6	1
Indeno(1,2,3-c,d)Pyrene	mg/kg	3	<0.1	31	510	0
Total PAH	mg/kg	3	<2	300	1000*	0
Total Phenol	mg/kg	4	<0.3	0.6	1500	0
* EA Threshold Values						

Summary of Organic Contamination Testing Results

From the six samples, a single sample (from the granular made ground within CP01) indicated raised levels of dibenzo(a,h)anthracene above S4UL threshold values.

Whilst the results from the remaining 5 samples point to a very localised hotspot (from a possible fuel spill, for example), any potential pathway will effectively be removed given the nature of the proposed hard cover within that specific area of the site.

7.0 GROUND GASES

The full results from gas monitoring undertaken within the site can be found in the SOLMEK Ground Gas Assessment[3].

Six gas monitoring visits were undertaken between July and October 2025 across 3 monitoring wells (18 samples).

The worst case GSV has been derived from the highest flow rate recorded over the visits (3.0 l/hr - Visit 1, CP01) along with the greatest volume of CH_4 (30.4% - Visit 1, CP01).

Based on these figures the worst case **GSV** has been calculated as **0.9120 l/hr.**

The results of the gas screening confirm that the site is classified at the low end of Characteristic Situation (CS) 3 in accordance with CIRIA R149/BS8485:

Table 2 **CS by site characteristic GSV**

CS	Hazard potential	Site characteristic GSV [A)] L/h	Additional factors
CS1	Very low	<0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	0.07 to <0.7	Typical measured flow rate <70 L/h (otherwise consider an increase to CS3)
CS3	Moderate	0.7 to <3.5	–
CS4	Moderate to high	3.5 to <15	–
CS5	High	15 to <70	–
CS6	Very high	>70	–

[A)] The figures used in this column are empirical.

NOTE The CS is equivalent to the characteristic GSV in CIRIA C665 [6].

Table 2 from BS8485

It is however also worth emphasising that the elevated result is a single one-off occurrence and could represent an anomaly. The adopted GSV is therefore considered to be a conservative, precautionary position;

The second highest GSV is calculated at 0.1050 l/hr (CP01, $C0_2$, visit 3)
The average GSV across all 18 monitoring visits (for both CH_4 and $C0_2$) is 0.0369 l/s.
The average GSV across the remaining 17 monitoring visits is 0.0119 l/s.
The average GSV across all results for CP01 is 0.104 l/s.

The proposed buildings are **commercial/public** with **small to large room** sizes.

Therefore, with reference to Table 4, a minimum gas protection score of 3.0 is required.

- **Type C building**: commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).

Table 3 **Building types**

	Type A	Type B	Type C	Type D
Ownership	Private	Private or commercial/ public, possible multiple	Commercial/ public	Commercial/ industrial
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full
Room sizes	Small	Small/ medium	Small to large	Large industrial/ retail park style

Table 3 from BS8485

Table 4 **Gas protection score by CS and type of building**

CS	Minimum gas protection score (points)			
	High risk		Medium risk	Low risk
	Type A building	Type B building	Type C building	Type D building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5[A)]	5.5[A)]	4.5	3.5
5	—[B)]	6.5[A)]	5.5	4.5
6	—[B)]	—[B)]	7.5	6.5

[A)] Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

[B)] The gas hazard is too high for this empirical method to be used to define the gas protection measures.

Table 4 from BS8485

On this basis, appropriate protection measures are selected from Tables 5,6 and 7, which **must achieve a total score of, at least, 3.0.**

Due to the nature of the ground conditions encountered as part of the Phase 2 Ground Investigation, a fully suspended/piled foundation solution is proposed, which will remove the risk of any possible long-term settlement of the shallow soft, low strength deposits.

The slab will be fully, continually structurally reinforced, which achieves a score of 1.5:

Table 5 **Gas protection scores for the structural barrier**

Floor and substructure design (see Annex A)	Score [A]
Precast suspended segmental subfloor (i.e. beam and block)	0
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 [B]
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing [C]	2
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing [C]	2.5

[A] The scores are conditional on breaches of floor slabs, etc., being effectively sealed.
[B] To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see A.2.2.2).
[C] The score is conditional on the waterproofing not being based on the use of a geosynthetic clay liner waterproofing product (see C.3, Note 4).

Table 5 from BS8485

A pressure relief pathway, typically comprising *Cordek Geocomposite Vent Mat*, or similar, *or* a combination of no fines gravel and perforated pipe, terminating externally, will be used, which achieves a score or 1.5**, however, a conservative score of 0.5 shall be adopted in accordance with Appendix B8 of BS8485:**

Table 6 **Gas protection scores for ventilation protection measures**

Protection element/system	Score	Comments
(a) Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is zero.
(b) Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are: • Clear void • Polystyrene void former blanket • Geocomposite void former blanket • No-fines gravel layer with gas drains • No-fines gravel layer	 2.5 1.5	Performance criteria for methane and carbon dioxide are shown in Figure B.6 and Figure B.7, respectively. The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B. Passive ventilation should be designed to meet at least "good performance", see Annex B.

Extract from Table 6 of BS8485

A gas resistant membrane will be used, which achieves a score or 2:

Visqueen Gas Barrier, or similar, shall be used, which complies with BS8485.

Table 7 **Gas protection score for the gas resistant membrane**

Protection element/system	Score	Comments
Gas resistant membrane meeting all of the following criteria: • sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735 [N1]	2	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. For example, a minimum 0.4 mm thickness (equivalent to 370 g/m² for polyethelene) reinforced membrane (virgin polymer) meets the performance criteria in Table 7 (see **C.3**). If a membrane is installed that does not meet all the criteria in column 1 then the score is zero.

<u>Consider Verification Requirements in accordance with CIRIA C735[4]</u>

CIRIA C735 provides good practice guidance, and advocates that an informed and risk-based approach should be taken to determine the requirements of any verification plan.

The overall site is well characterised as CS3 – if anything being only marginally outside the limits of CS2.

A gas protection score of 3.0 has been adopted. 4.0 is being achieved.

The design of the foundation and gas protection system is also simple.

The membrane will be installed by an experienced workforce.

1. CIRIA C735 – Good practice on the testing and verification of protection systems for buildings against hazardous ground gases, CIRIA 2014.

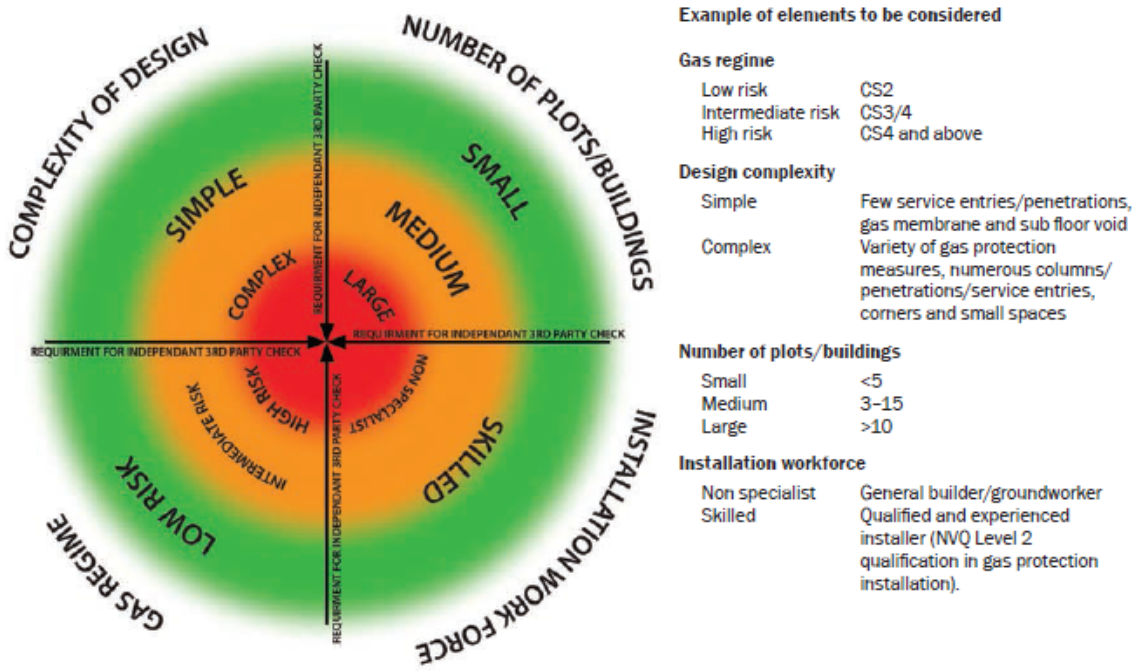


Figure 3.1 Illustration of factors to be taken into account in determining the scope and level of independence in the verification of gas protection systems in buildings

Figure 3.1 from CIRIA C735[4]

With reference to figure 3.1of CIRIA C735; most, if not all, of the factors fall into the green areas.

CIRIA C735 states, in such circumstances, that '*independence in the verification process is not likely to be critical*.' '*An independent third- party verifier would be likely to have a relatively light touch role, or not be involved at all*'.

Consequently, given that the membrane will be installed by experienced staff, will be witnessed by the contractor's management and the Approved Building Inspector, it is considered that the verification adequately meets the guidance within CIRIA C735[4].

On this basis, the total gas protection score achieved is as follows:

Structural Barrier (Table 5)	1.5
Pressure Relief Pathway (Table 6)	0.5
Gas Membrane (Table 7)	2.0
Total Score	**4.0**

The achieved score is greater than the required 3.0.

Whilst the existing floor construction is unknown, it is highly unlikely that any form of gas protection/remediation is present, and the proposed new-build element will therefore represent a significant betterment over the do-nothing scenario.

For ALLENBY COMMERCIAL LIMITED

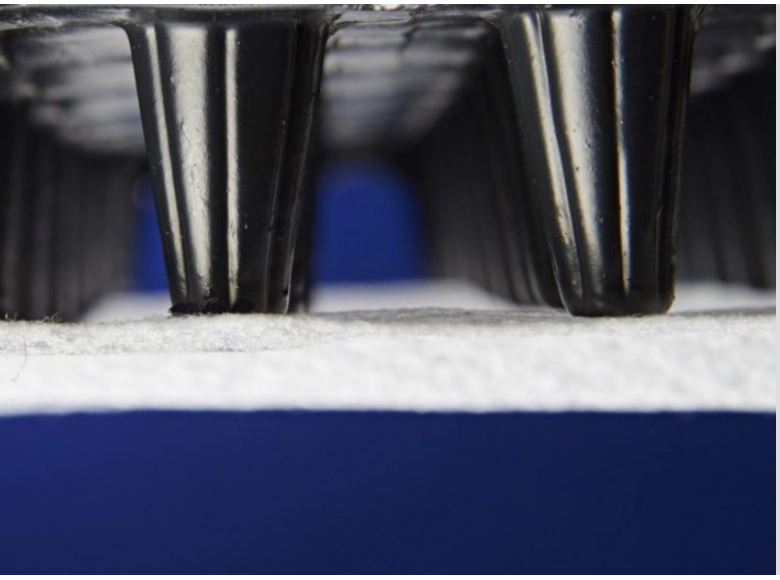


A .D Hayton BEng (Hons) CEng MICE MCIHT FIHE
CHARTERED CIVIL ENGINEER

APPENDIX I

CORDEK GEOCOMPOSITE VENT MAT DATA SHEET

Geocomposite Vent Mat Data Sheet



The Geocomposite Vent Mat is part of Cordek's Ground Gas Venting System range, designed to dilute and disperse hazardous ground gases from beneath the footprint of buildings to the atmosphere.

The product consists of a 25mm thick, cuspated HDPE profile with a geotextile filter layer bonded to one side and is supplied in roll format.

In addition to the Geocomposite Vent Mat, additional products within the Cordek VOC & Ground Gas range to provide a complete protection system include:

- VOC & Ground Gas Resistant Membranes
- VOC & Ground Gas Resistant Damp Proof Courses (DPC's)
- Membrane Jointing & Penetration Detailing Tapes
- Venting Accessories & Outlets

Further information on the above can be found on the Cordek website – www.cordek.com or by contacting a member of the Cordek technical team – **01403 799600**.

Key Features

- High compressive strength & excellent gas flow capacity
- Quick and simple installation
- Thin profile reduces excavation time and / or material removal costs
- Can be used for full coverage of building footprint (passive sub-floor dispersal layer) or in strips (pressure relief system)
- Suitable for projects with both Characteristic Gas Situation (CS) 2 and 3* designations, in-line with BS 8485:2015 + A1:2019

* Also suitable for CS4 designated projects, however this is subject to restrictions on building width.

Installation

The procedure for installing the Geocomposite Vent Mat is straightforward, but the following points should be adhered to:

- Please ensure that the Geocomposite Vent Mat is installed upon a flat and level surface consisting of a material that is suitably permeable to ground gases and vapours.
- The side with the bonded geotextile filter layer should be positioned directly on to the prepared sub-base, so that the points of the cuspations are facing downward.
- Where cutting of the product is required, this can be undertaken using a fine tooth saw or a sharp bladed tool.
- Individual strips or sections should be butted together, with taping of the joints using Cordek Formwork Tape to avoid any grout loss, unless overlain by a suitable membrane.
- Reinforcement spacers can be positioned directly upon the product, when the appropriate number and type of spacer are used. The top surface of the installation can be reinforced with a layer of concrete blinding to spread the spacer loads if required e.g. where a very heavy reinforcement arrangement has been specified.
- Further information relating to installation can be found within the Geocomposite Vent Mat Installation Guide, available for download from www.cordek.com.

For further information, please contact the Cordek technical team on 01403 799600, techsupport@cordek.com or consult our website at www.cordek.com.

Storage & Handling

All products are delivered in a polythene wrapping and are clearly labelled. Rolls are delivered on either pallets or bearers to allow mechanical unloading and handling.

Once in position, unrolling of the product can be undertaken manually as can manoeuvring of individual strips or sections, considering any site-specific manual handling requirements or restrictions.

No specific storage requirements are needed as the product is unaffected by both UV light and water when in its original packaging.

Products Sizes

Dimensions (when unrolled): 25mm deep x 900mm wide x 50m long (45 sq/m overall)

Dimensions (on roll): 900mm deep x 1300mm external diameter when laid on side

Approximate Product Weight: 75kg per roll

Properties

	Test	Unit	Mean Values		
MECHANICAL PROPERTIES - Geocomposite					
Compressive strength	EN ISO 25619-2	kPa	300		
Tensile strength (MD/CMD)	EN ISO 10319	kN/m	18		
Static puncture (CBR)	EN ISO 12236	kN	2.2		
HYDRAULIC PROPERTIES - Geotextile					
Water permeability v_{H50}	EN ISO 11058	l/(m^2·s)	100		
Apparent opening size	EN ISO 12956	µm	80		
HYDRAULIC PROPERTIES - Geocomposite					
Gas flow capacity	Calculated[(b)]	m^3/s	0.07		
Water flow capacity in the plane (rigid/rigid)	EN ISO 12958	l/(m·s)	(i=1)	(i=0.5)	(i=0.1)
@ 20kPa			15.0	11.0	5.0
@ 100kPa			15.0	11.0	5.0
@ 200kPa			15.0	11.0	5.0
PHYSICAL PROPERTIES					
Thickness @ 2kPa	EN ISO 9863-1	mm	26		
Standard colour - Cuspate			Black		
Polymer - Cuspate			HDPE		
Polymer - Textile			PP		

Notes:

a) Mean values indicate the arithmetic mean derived from the samples taken for any one test as defined in the standard – usually an overall mean of five samples.

Mean values are subject to tolerances based on 95% confidence limits as published on the product CE declaration of performance.

b) Gas flow calculation based on a discharge coefficient of 0.61 with a pressure difference of 10Pa and a standard air density of 1.29kg/m^3.

Additional VOC & Ground Gas Protection Products:

Alternative Ground Gas Venting Systems:

A unique range of gas ventilation products which have been developed following extensive research and testing. These include:

Ventform - Moulded EPS panels that provide a combination of ground gas venting capabilities with insulation properties

Cellvent HX - The combined ground heave protection and passive venting system

Radon Sumps - A collection and extraction point for radon gas from beneath the foundations of buildings

VOC & Ground Gas Resistant Membranes:

A range of construction membranes with proven resistance to the transmission of Volatile Organic Compounds (VOC's), Hydrocarbons, Methane, Carbon Dioxide and Radon, whilst also performing the function of a Damp Proof Membrane (DPM).

VOC & Ground Gas Resistant Damp Proof Courses (DPC's):

These Damp Proof Courses (DPC's) are designed to be installed within masonry wall constructions to restrict the transmission of VOC's, ground gases and moisture. With excellent all round physical properties, including good mortar adhesion and flexibility even at low temperatures, they are designed to be used in conjunction with corresponding membranes that have the same performance characteristics.

Gas Membrane Jointing Tapes:

In instances where its is permissible to do so, this range of products offer a robust and versatile method of effectively sealing junctions, laps and penetrations within Ground Gas Resistant Membrane installations.

Venting Accessories & Outlets:

To adequately vent VOC's and ground gases from beneath the footprint of a building, vent outlets are required to be connected to the sub-floor venting system.

The selection of the most appropriate vent type is based upon their proposed location, the perimeter wall construction of the building and the required air flow capacity, which in turn dictates the spacing between each vent.

Cordek offer a range of ventilation accessories and outlets, to passively vent ground gases and vapours safely from beneath the building footprint to the atmosphere.

Issued: 02/2022

DISCLAIMER: Information contained within this 'Technical Data Sheet' is for guidance only, and it is intended for experienced construction industry workers. It contains summaries of aspects of the subject matter and does not provide comprehensive statements of construction industry practice. As conditions of usage and installation are beyond our control we do not warrant performance obtained. Please contact us if you have any doubt as to the suitability of application. The information provided within this document is based on data and knowledge correct at the time of printing.

Cordek Ltd
Spring Copse Business Park, Slinfold, West Sussex
RH13 0SZ, United Kingdom

Telephone (+44) 1403 799600 Fax (+44) 1403 791718
E-mail info@cordek.com

www.cordek.com

APPENDIX II

VISQUEEN GAS BARRIER DATA SHEET

Technical support: +44 (0) 333 202 6800

Date Published: 22/09/2021

Visqueen Gas Barrier

Features and benefits

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

Product description

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

Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Suitable for all Characteristic Gas Situation (CS) ground gas regimes
- Conforms to the specification requirements of NHBC Amber 1 and Amber 2 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

Usage

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

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

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

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

System components

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

Find your local stockist



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

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Visqueen Gas Barrier

Storage and handling

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

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

Preparation

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

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

When installing the membrane in demanding site conditions, use Visqueen GR Lap Tape in place of Visqueen Gas Resistant Foil Lap Tape.

Installation

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

The barrier should be clean and dry at the time of jointing. It should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape.

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

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

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

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

Long periods of exposure to ultraviolet light will reduce the effectiveness of the membrane. The membrane should be covered by a protective layer immediately after installation to prevent damage from following trades, ultraviolet light, etc. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the barrier the wire reinforcements and spacers must be prevented from puncturing the barrier. Where there is a high risk of potential damage, the barrier should be covered with Visqueen TreadGuard protection, screed, or other approved protection material before positioning the reinforcement.

Usable temperature range

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

Additional information

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

The information in this datasheet was correct at the time of publication. It is the user's responsibility to obtain the latest version of the datasheet as it is updated on a regular basis. The information contained in the latest datasheet supersedes all previously published editions.

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Property	Test method	Units	Compliance criteria	Result
Dimensions	EN 1848-2	m		2 x 50
Overall thickness including scrim mesh	EN 1849-2	mm	+/-10%	0.52
Mass	EN 1849-2	g/m^2	-0%/+5%	400
Tensile strength - MD	EN 12311	N	MLV	350
Tensile strength - CD	EN 12311	N	MLV	350
Tensile elongation - MD	EN 12311	%	MLV	20
Tensile elongation - CD	EN 12311	%	MLV	21
Joint strength	EN 12317-2	N	MLV	332
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	MDV	150
Dart impact	BS 2782	g	MDV	731
Low temperature flexibility	EN 495-5	°C	MDV	-40
Durability against ageing	EN 1296 and EN 1928	-	Pass/Fail	Pass
Durability chemical resistance	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	358
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	368
Resistance to static loading	EN 12730	kg	MLV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	7000
Water vapour transmission - permeability	EN 1931	g/m^2/d	MDV	0.03
Visible defects	EN 1850 -2	-	Pass/Fail	Pass
Reaction to fire	EN 13501-1	Class	MDV	F
BS 8485:2015 + A1:2019 testing requirements				
Mass	EN 1849-2	g/m^2	Average >370	400
Methane permeability	ISO 15105-1	mls/m^2/d/atm	Pass/Fail	<0.15
Puncture CBR	BS EN ISO 12236	N	MDV	1114
Tensiles yield strength MD	ASTM D4885-01	kN/m	MDV	12.5
Tensiles yield strength CD	ASTM D4885-02	kN/m	MDV	7.3
Resistance to static loading	EN 12730	kg	>MLV	20
Yield elongation CD	ASTM D4885-04	%	MDV	19
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	48.2
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	44.8
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	53.5
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	60.6

Health and safety information

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

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Visqueen Gas Barrier

About Visqueen

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

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

Complete Range, Complete Solution



Structural Waterproofing | Gas Protection | Damp Proof Membrane | Tapes | Damp Proof Course | Stormwater | Vapour Control

Visqueen Technical Support

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

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

Visqueen CPD Seminars

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

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

Visqueen PI designs and special projects

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

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

Visqueen Training Academy

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

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

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