

Dealt with by: Environmental Health

Our Ref: [DOC/2022/0052](#)

Direct Dial: (01538) 395400

Your Ref: [DOC/2022/0052](#)

Email: EHealth.Consultation@highpeak.gov.uk

Date: 13th December 2022

MEMORANDUM: PLANNING CONSULTATION
--

LOCATION

**Land And Buildings To The Rear Of Knights The Green
Cheadle**

PROPOSED DEVELOPMENT

**Discharge of conditions 15, 16, 20 and 26 in relation to
[SMD/2020/0029](#).**

The following conditions are relevant to Environmental Health:

Conditions 20

Prior to bringing the development into first use, a validation report demonstrating completion of the works set out in the approved remediation strategy (Ref: Remediation Method Statement, The Green Cheadle 1037/LO.002/AMG) and the effectiveness of the remediation shall be submitted to and approved, in writing, by the local planning authority. The report shall include results of sampling and monitoring carried out in accordance with the approved validation plan (Ref: Remediation Method Statement, The Green Cheadle 1037/LO.002/AMG; Appendix 2) to demonstrate that the site remediation criteria have been met. It shall also include any plan (a long-term monitoring and maintenance plan) for longer term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the validation plan, and for the reporting of this to the local planning authority.

Recommendation

The condition is **not** recommended for discharge

Reason (summary)

The submitted document does not yet contain the all information stated by the applicant in the agreed remediation Method Statement 1037/LO.002/AMG;. Notably, it contains no information that the required gas protection measures have been installed inline with the stated and agreed methodology. It also contains no information on the source of material used for the “clean cap” or a clear evidence that an appropriate geo text membrane has been used of the agreed anti dig layer.

Comments

A Construction Phase Remediation – Clean Cover Validation Works by Georisk Management

Limited ([Ref 21037/LO.003/AJC](#)) was submitted to support the application discharge.

Note:

Conditions 21:

No soil is to be imported to the site until it has been tested for contamination and assessed for its suitability for the proposed development...

Has not been applied for discharge

Comments

The agreed remediation strategy and verification plan is attached for reference. The submitted verification report does not contain all the required information and appears to deviate from the agreed validation plan.

These are noted below:

- a 100 mm stone anti-dig layer was agreed and a 1m cover in all gardens

Instead the applicant has installed “a geogrid anti-dig layer” in place of a stone anti-dig layer.

This “in principle” is accepted but the geotextile membrane (which are typically brightly coloured as a warning to future residents) cannot be seen clearly in any of the provided photographs therefore, it cannot be verified that this has been installed correctly.

There is some sort of membrane / tarp seen in the public open space validation (page 6). However, this is beneath woodchip so appears to be an anti-weed membrane.

No additional details such as, the make, manufacturer or picture of the anti-dig geotextile membrane has been provided.

- 1 meter cover was agreed for all gardens front and back

Instead the applicant has only 300mm of clean cover in the front garden areas. Coupled with a lack of clear evidence that an appropriate anti dig/ warning membrane has also been installed this is not accepted

Soil Cap and importation

*From RemStrat: All subsoil or topsoil imported onto site will need to undergo validation testing. The schedule for this testing would need to **be agreed with the Local Authority in advance and would be dependent on the source of the imported materials**. The testing regime and site acceptance criteria below are based on soil from a ‘greenfield’ source: however, if a recycled product was to be used further tests, such as asbestos, may be required*

- No information on any of the source of soil (or soil movements within on or off site) has been provided and soils do not appear to have been tested before importation – if indeed they were imported?
- Not clear if any made ground / material was exported off site, or any of the possible internal movement of material (and potential contamination) within the site. Where did

excavations end up?

The above noted I am pleased to state that the selected soil samples presented for the garden areas below the relevant site acceptance criteria, (though depth of sample would have been welcomed rather than only TS/SS) so indicate that clean imported soil was used.

However, the omissions discussed above still need to be addressed.

Gas Protection

The agreed remediation strategy also included the requirement for gas protection measures to be installed.

- The report contains no information on gas protection measures

Our Ref: 21037/LO.002/AMG

Mr. S. Lowndes
Ashgreen Group Limited
33 Wolverhampton Road
CANNOCK
Staffordshire
WS11 1AP

21 October 2021

Dear Stephen

**REMEDIATION METHOD STATEMENT
THE GREEN, CHEADLE**

As requested, please find attached the revised Remediation Method Statement for the above site.

This report will need to be submitted to the Local Authority to discharge relevant planning conditions.

Please do not hesitate to call should you need to discuss anything further.

Yours sincerely

**Mark Gill
Director**

mobile:
mark.gill@georisk-uk.com

REMEDIATION METHOD STATEMENT THE GREEN, CHEADLE

Introduction

This document summarises the remediation measures required to address human health risk issues at the above development site based on the findings of the following reports by Georisk Management Limited (Georisk):

- *'Geoenvironmental Assessment: The Green, Cheadle'* reference 11091/1 dated July 2011;
- *'Environmental Assessment: The Green, Cheadle'* reference 21037/1 revision 1 dated July 2021.

This work will need to be carried out to address contaminated land conditions associated with planning application reference SMD/2020/0029 and this Remediation Method Statement (RMS) includes further requirements of Staffordshire Moorlands District Council.

Proposed Development

The proposed development is to comprise 9 No. houses with private gardens together with hardstanding for access and parking.

Investigation Summary

The site is situated to the north of The Green in Cheadle, Staffordshire and can be located approximately by National Grid Reference 399720, 342920.

It covers an area of approximately 0.36 ha and is a broadly rectangular shaped parcel of land with a narrow track extending from The Green, towards the south of the site and between a house called The Cottage to the west and petrol station to the east.

The site has recently been subject to demolition of all above ground structures. It is approximately level and the surface covering comprises of a combination of gravel, concrete and tarmac hardstanding.

Maps published by the BGS indicate the geology at the site to comprise Glacial Till of Devensian age overlying the Pennine Middle Coal Measures Formation (mudstone, siltstone and sandstone) of Carboniferous age. The presence of Made Ground associated with past use and development of the site should also be anticipated.

Ground investigation identified Made Ground was recorded across the site from ground level to depths of between 0.2 and 3.3 m begl (not fully penetrated in TP01 and TP03) and generally consisted of a surface covering of a light yellow grey sandy limestone, sandstone gravel, underlain by soft to firm, yellowish brown, mottled grey, gravelly (quartz, red brick) silty sandy clay. In TP01, soft locally firm dark brown clayey reworked silt was recorded from 0.5 to 2.1 m begl, which was underlain by a soft gravelly buried topsoil comprising metal, concrete, glass with frequent ash to a depth of 3.3 m begl. In TP03, the Made Ground comprised soft dark grey black, sandy gravelly clay with whole red brick, concrete, wood, with frequent ash and rare concrete cobbles to 2.7 m begl, which was underlain by firm yellowish brown, mottled grey-orange, gravelly silty clay with quartz and rare brick to 3.0 m begl. The Made Ground reduced in thickness to the east with the deepest deposits recorded in the west.

Glacial Till was encountered beneath the Made Ground and predominantly comprised firm to stiff, yellowish brown, mottled grey red, gravelly (quartz) silty clay.

During the fieldwork, visual/olfactory evidence of potential hydrocarbon impact was observed in TP05 at depths of between 0.2 to 0.4 m begl during the fieldwork.

The Exploratory Hole Location Plan from the ground investigation is included in Appendix A for reference.

Soil-gas monitoring by Georisk in 2011 recorded no methane and steady state carbon dioxide levels from 1.1 to 10.4 % by volume (v/v). A maximum positive gas flow rate of 1.4 l/hr was recorded and the ambient atmospheric pressure ranged from 1008 to 1030 mb during the monitoring programme.

Chemical testing of the near-surface Made Ground recorded levels of heavy metals (arsenic, cadmium, copper, lead, nickel and zinc) and PAH compounds above the relevant assessment criteria.

All TPH concentrations were below the relevant S4UL for each hydrocarbon fraction.

Asbestos was identified in Made Ground in TP03 at 0.2 m begl and in TP07 at 0.2 m begl in the form of chrysotile (fibres/clumps and cement). Asbestos quantification testing of these samples gave results of 0.007 % by weight in TP03 and 0.026 % by weight in TP07.

All soil leachability test results for the contaminants of concern from the 2021 investigation were below the adopted screening values; however, the 2011 report identified soil leachate exceedances in TP7 at 2.0 m for cadmium (5.7 µg/l) and zinc (510 µg/l), and BH3 at 3.0 m for zinc (1600 µg/l).

Surface water testing did not identify any significant contamination in the adjacent watercourse.

It is considered that the soil leachate exceedances reported in the 2011 report relate to highly localised metal contamination in Made Ground that has not mobilised.

The Water Quality Standards adopted are considered highly stringent screening levels and based on all results, it is considered that no significant contamination is entering the surface water stream and that no significant risk to controlled waters exists. No further action with regards to controlled waters is considered necessary to facilitate the proposed development.

Risk Evaluation

Future site users should be considered as targets by physical contact, ingestion and dust inhalation associated with potentially contaminated soil beneath gardens. For housing with private gardens, root uptake by vegetation of any contamination present in the near surface soils also needs to be considered.

Future site users are also considered as targets in the form of indoor inhalation of hazardous soil-gases.

Following risk assessment utilising data obtained from the intrusive investigation, the following remaining pollutant linkages have been identified as being of concern in terms of the redevelopment of the site:

Source	Pathway	Target
Elevated concentrations of asbestos, heavy metals and PAH compounds in Made Ground.	Dermal contact	Site user: female child 0-6 years
		Site construction worker
	Ingestion	Site user: female child 0-6 years
		Site construction worker
	Consumption of home-grown vegetables grown in Made Ground	Site user: female child 0-6 years
	Ingestion of soil attached to home-grown vegetables	Site user: female child 0-6 years
	Dermal contact with dust derived from Made Ground	Site user: female child 0-6 years
	Ingestion of dust derived from Made Ground	Site user: female child 0-6 years
	Inhalation of dust derived from Made Ground	Site user: female child 0-6 years
Elevated levels of soil-gas in Made Ground	Direct contact	Water supply pipework
	Indoor inhalation of hazardous soil-gases	Site user: female child 0-6 years

In summary, the remedial measures required to achieve safe redevelopment of the site for housing are as follows:

- provision of clean cover in all gardens;
- provision of gas protection to all houses.

Based on the findings of the ground investigation, remediation works are required in order to facilitate redevelopment and provide a development platform that is “suitable for use”. The viable pollutant linkages that need to be addressed are detailed above. Further details with respect to the remediation methodology are provided in the following sections.

Remediation Proposals – Human Health - Risk from Asbestos, Heavy Metals and PAH in Made Ground

To address the remaining pollutant linkages to future site users from elevated levels of asbestos, heavy metals and PAH in the Made Ground, it is recommended that allowance is made for the provision of a blinding layer of clean imported soil in garden and soft landscaped areas to act as a physical barrier between site users and the Made Ground.

To satisfy the requirements of Staffordshire Moorlands District Council, the composition and thickness of the cover layer should be as follows:

- gardens: 1000 mm comprising 100 mm granular anti-dig layer and 900 mm subsoil and topsoil;
- soft landscaped areas: 400 mm comprising 100 mm granular anti-dig layer and 300 mm topsoil.

Diagrammatic sections of the cover layer are presented below:

Gardens

	150 mm topsoil
	750 mm subsoil
	100 mm anti-dig layer

Soft Landscaping

	300 mm topsoil
	100 mm anti-dig layer

The cover layer is to be constructed post-plot construction to avoid damage or cross-contamination. The area should first be regraded to achieve a formation capable of accommodating placement of the clean soil and any oversize/unsuitable materials present at formation level should be removed.

Any materials imported onto site for use as clean cover must be stockpiled on plastic sheeting to avoid cross-contaminating imported material with on-site Made Ground.

Hardcover areas such as drives and pathways will be constructed with stone capping layers placed above existing levels and; therefore, further mitigation is not required.

General Considerations

The contaminated Made Ground represents no plausible pollutant linkage beneath plots or hardstanding. There is no specific need to remove Made Ground from site to enable construction of the clean cover layer; however, any excess Made Ground that is taken off site would need to be taken to a suitably licensed land fill under duty of care documentation.

The cover layer is to be constructed post-plot construction and; therefore, the likelihood that any excavated material would be placed in remediated garden or soft landscaped areas is very low. In the unlikely event that any excavation work does take place after clean cover has been placed, excavated materials are not to be placed in garden or soft landscaped areas and can only be placed on areas of hardstanding prior to off-site disposal.

During the redevelopment of the site, construction workers are likely to be in direct contact with the near-surface soils and appropriate Health and Safety measures will need to be implemented based on the findings of this investigation.

Neighbouring site users may be potentially exposed to residual contamination through generation of dust through site redevelopment activities. This is an acute exposure risk and is manageable by implementing an appropriate construction management plan; for example, dust suppression removes the potential pollutant linkage.

Should any areas of previously unidentified potentially contaminated soil be encountered during future site construction works, we would recommend consultation with Georisk to ensure that our recommendations continue to apply. Any potentially contaminated soils would need to be left in situ pending further assessment.

The site is considered to be 'brownfield' and; therefore, in accordance with UKWIR (2010) guidance on the protection of water supply pipes, it is recommended that allowance is made for the use of multi-layer barrier pipes for potable water supply. It is recommended that a copy of this report is supplied to utility companies and that their recommendations relating to appropriate supply pipes are adhered to.

Clean Cover Validation

Placement of the cover layer will require independent verification and validation and these requirements are set out below.

All subsoil or topsoil imported onto site will need to undergo validation testing. The schedule for this testing would need to be agreed with the Local Authority in advance and would be dependent on the source of the imported materials. The testing regime and site acceptance criteria below are based on soil from a 'greenfield' source: however, if a recycled product was to be used further tests, such as asbestos, may be required:

Determinand	Maximum Allowable Concentration (mg/kg)
Arsenic	37
Asbestos	Not present
Cadmium	11
Chromium	910
Copper	2400
Cyanide	34
Lead	200
Mercury	40
Nickel	130
PAH compounds	LQM/CIEH S4ULs
Phenol	120
Selenium	250
Total Petroleum Hydrocarbons	LQM/CIEH S4ULs for aliphatic/aromatic carbon ranges
Zinc	3700

In addition any topsoil materials should be free from large stones and deleterious materials based on the guidance presented in BS 3882:2015.

The testing outlined above should be carried out at an independent UKAS accredited laboratory and certification results made available in advance of any subsoil or topsoil being imported onto site to confirm that it is suitable for use.

All materials imported onto site will also need to be sampled and tested after placement to validate the pre-importation test results – the proposed test locations are:

Plot 1 (back)	Plot 3 (back)	Plot 4 (back)	Plot 5 (front & back)	Plot 6 (front & back)	Plot 7 (front & back)
Plot 9 (back)	POS 1	POS 2			

These are also shown on the Validation Plan, included in Appendix B.

Once appropriate certification has been provided and the clean cover has been placed in the required areas, the thickness of placed soil will require validation. This is best achieved either by inspecting the soils during placement or by inspecting trial holes dug through the placed soil. A validation engineer should attend site to record the thickness of cover placed at the locations set out below:

Plot 1 (back)	Plot 3 (back)	Plot 4 (back)	Plot 5 (front & back)	Plot 6 (front & back)	Plot 7 (front & back)
Plot 9 (back)	POS 1	POS 2			

These are also shown on the Validation Plan, included in Appendix B.

A verification certificate/report confirming the installation of clean cover will be issued following completion of each verification visit and will include:

- site address/development details;
- planning application reference;
- plot number(s) and date of inspection;
- details of Georisk personnel who inspected the installation;
- photographic records to demonstrate compliance with the remediation strategy;
- testing of import materials to confirm suitability for use;
- validation of the thickness of cover layer placed;
- certification and validation of imported materials;
- provision of transfer notes for imported soil;
- statement of compliance with RMS.

These reports will be submitted to the Local Authority for approval and discharge of planning conditions.

Remediation Proposals – Gas Protection

Protection Strategy

In accordance with BS8485:2015(+A1:2019), the site has been classified as Characteristic Situation 2 (CS2) on the basis of recorded carbon dioxide levels.

Referring to Table 3 of BS8485 (2015+A1:2019), the proposed development can be classified as ‘Type A’ buildings – these will be in private ownership with no central building management control of any alterations to the building and small room sizes.

Referring to Table 4 of BS8485 (2015+A1:2019), for a ‘Type A’ building, a minimum gas protection points score of 3.5 needs to be achieved for a CS2 classification.

Referring to Table 6 of BS8485 (2015+A1:2019), a passive sub-floor dispersal layer providing good performance achieves a gas protection points score of 1.5.

Referring to Table 7 of BS8485 (2015+A1:2019), a gas resistant membrane achieves a gas protection points score of 2.

The provision of a carbon dioxide resistant membrane and ventilated sub-floor void will create a permeability contrast to limit the ingress of gas into buildings achieve the minimum points score of 3.5 for CS2 protection to ‘Type A’ buildings in accordance with BS8485 (2015+A1:2019). The gas protection measures should be installed as prescribed in BRE 414 and ventilation of the sub-floor void should be designed to provide a minimum of one complete volume change per 24 hours.

Gas Protection Measures Details

Typical detail drawings showing the placement of the membrane within construction of house foundations will need to be produced. The gas membrane will be protected by the floor insulation and screed once installed.

The DPC to be used on site is Visqueen Zedex CPT DPC, which will be installed and sealed with the gas protection membrane in line with the manufacturer's recommendations and specification (if this product is not available at time of installation, a suitable alternative product would be used subject to approval by Georisk).

The membrane to be installed on site is a Visqueen Low Permeability Gas Membrane, which is suitable for CS2 site conditions in accordance with EN 13967:2017 (if this product is not available at time of installation, a suitable alternative product would be used subject to approval by Georisk). Technical specification details are provided in Appendix C.

The membrane will be laid continuously over the whole ground floor area and sealed to the DPC which is to be placed across the cavity to the face of the external brickwork. Cavity trays are to be installed along the length of the cavity above the DPC. All joints in the membrane (and between the membrane and DPC) are to be overlapped and taped (a minimum overlap of 150 mm), or site welded to the manufacturer's specification.

Verification Strategy

Reference has been made to CIRIA C735: "Good practice on the testing and verification of protection systems for buildings against hazardous ground gases" 2016 and the risk based approach to determine verification requirements. **As recommended by C735 this approach has been referenced for guidance purposes and has been used in conjunction with professional judgment taking into account the gas hazard at the site.**

The following summarises the risk based decision structure to evaluate verification requirements for the project:

Gas Regime/Risk	Floor Slab Type	Installer Experience	Verification Requirements
CS2	'Beam and block' floor with 150 mm minimum ventilated void	Groundworker (no relevant experience)	To be verified by Consultant to conduct thorough verification (visual) inspection of plots. – see table below.

The proposed inspection locations are to be the first plot constructed followed by the following plots/plot groups:

Plot 1	Plot 3	Plot 5	Plot 7	Plot 9
--------	--------	--------	--------	--------

These are also shown on the Validation Plan, included in Appendix B.

Verification works will be undertaken by suitably qualified and independent geoenvironmental consultants employed by Georisk Management Limited with a minimum of 5 years of experience in the assessment and validation of remediation works for housing developments on brownfield sites.

Visual inspections will be recorded using a CIRIA suggested proforma, included in Appendix D.

If validation inspections reveal that gas protection has not been satisfactorily installed, then remedial work shall be undertaken to ensure satisfactory implementation of measures. This should be supported by integrity testing if deemed necessary.

Verification Reports

A verification certificate/report confirming the installation of gas protection measures will be issued following completion of each verification visit and will include:

- site address/development details;
- planning application reference;
- date of inspection;
- details of Georisk personnel who inspected the installation;
- description of protection measures installed;
- confirmation of gas membrane used;
- details of any identified issues of concern and remedial actions/integrity testing if required;
- photographic evidence of installation works;

- completed CIRIA 'Visual Inspection of Gas Protection Measures';
- statement of compliance with RMS.

Construction site management will need to contact Georisk to arrange for site visits - our office telephone number is 0121 553 4044 – please refer to job number 21037.

APPENDIX A
EXPLORATORY HOLE LOCATION PLAN



Notes

This drawing is the copyright of georisk management ltd and may not be reproduced, copied or used without express written permission.

This drawing is to be read in conjunction with all development drawings, and designers risk assessments.

This drawing must not be scaled. Work to figured dimensions only.

KEY

Trial Pit Location

Borehole Location

Rev	Date	Description	Initials

Client

ASHGREEN LIMITED

georisk
MANAGEMENT

Summit Point, Summit Crescent, Smethwick, Birmingham B66 1BT
t 0121 553 4044 f 0121 553 1112
www.georisk-uk.com, email, enquiries@georisk-uk.com

Contract

THE GREEN CHEADLE

Drawing Title

EXPLORATORY HOLE LOCATION PLAN

Drawing Status

FINAL

Drawn By	KAS	Date	22/02/21
Checked/Approved	KMM	Date	22/02/21
Scale	NTS	Drawing Number	21037/1

**APPENDIX B
VALIDATION PLAN**

Copyright of this plan is retained in the Designer and it must not be copied or reproduced without written consent.

Rev	Drawn	Comments	Date
A	ME	Check all annotations, dimensions & final data added	06/10/20
B	ME	Start building up to final plan, drawing notes	06/10/20
C	ME	Final 4, 5 & 6 house positions, annotations	06/10/20

VALIDATION

GAS PROTECTION

CLEAN COVER

VALIDATION PLAN

ASHGREEN LIMITED
 PROPOSED HOUSING DEVELOPMENT AT THE GREEN
 PROPOSED SITE PLANS
 PLANNING PERMISSION
 JULY 2019
 AS SHOWN
 100-02C

3 Bed detached house (Plots 4, 6)
 Scale 1:500

3 Bed detached house (Plots 2, 5, 8)
 Scale 1:500

3 Bed detached house (Plot 1, 3, 7, 9)
 Scale 1:500



Proposed site plan
 Scale 1:200

APPENDIX C
GAS MEMBRANE SPECIFICATION

Visqueen Low Permeability Gas Membrane

Features and benefits

- BBA certified - third party accreditation
- Complies with NHBC Amber 1 - suitable for low gas risk NHBC housing sites
- Flexible - easy to detail and install on site
- Supplied centre folded - reduces the risk of cracks in screed and limits creases
- 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 Low Permeability Gas Membrane is a robust co-polymer thermoplastic gas membrane, 0.5mm thick, yellow in colour and supplied 4m x 12.5m in a center folded roll.

Approvals and standards

- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of NHBC Amber 1 applications
- Conforms to the specification requirements of BR 211:2015
- CE Mark EN 13967:2017
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

Visqueen Low Permeability Gas Membrane is suitable to prevent the ingress of harmful levels of ground gases for housing applications where NHBC are the warranty provider and the site has been classified as Amber 1. In this application, the membrane is used above a precast suspended segmental ground floor system, for example a beam and block floor.

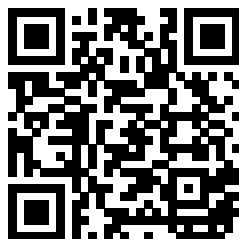
The membrane can also be used as a high performance radon membrane and/or damp proof membrane positioned within the ground floor construction either above or below the structural floor.

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 Top Hat 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



Visqueen Low Permeability Gas Membrane

Storage and handling

Visqueen Low Permeability Gas Membrane 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 Low Permeability Gas Membrane should be installed on a smooth continuous surface free from irregularities such as voids or protrusions e.g. grouted beam and block floor.

In radon applications, the membrane should be installed on a smooth continuous surface or 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 membrane can be cut with a sharp retractable safety knife or robust scissors.

Installation

Visqueen Low Permeability Gas Membrane should be loose laid on the substrate. The membrane should be clean and dry at the time of jointing. It should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Foil Lap Tape. In demanding site conditions seal lap joints with Visqueen Ultimate GR Lap Tape.

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

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

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

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

The membrane should be covered by a protective layer as soon as possible after installation to prevent damage e.g. from following trades. Care should be taken to ensure that the membrane is not punctured, stretched or displaced when applying a screed or final floor covering. A minimum thickness of 50mm screed is recommended. When reinforced concrete is to be laid over the membrane the wire reinforcements and spacers must be prevented from puncturing the membrane. Where there is a high risk of potential damage, the membrane 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 Low Permeability Gas Membrane and all associated system components should not be installed below 5°C

Additional information

When used in full radon protection areas, a Visqueen Radon Sump or subfloor ventilation system maybe required.

Where ground gas protection is required to BS 8485:2015 + A1:2019, use Visqueen Gas Barrier system.

To assist build sequencing, Visqueen Zedex CPT DPC is available for gas protection through masonry wall constructions.

For suspended beam and block floor detailing see LPGM-01.

Visqueen Preformed Top Hat Units should be used at service pipe penetrations see LPGM-51.

For internal and external corners Visqueen Preformed Corner Units should be used see PFU-553.

To seal around steel columns use Visqueen Pro Detailing Strip see LPGM-52.

For additional detailing information, contact Visqueen Technical Services +44 (0) 333 202 6800.

The product is recyclable and categorised under LDPE recycling code 4.

Visqueen is part of Berry bpi, the largest European recycler of polyethylene. This product is recyclable and should be segregated on site in accordance with site management procedures for plastic waste. We have 4 recycling sites in the UK where the plastic waste could be recycled and converted back into a second life product. Please contact us to find out more.

Visqueen Low Permeability Gas Membrane

Property	Test method	Units	Compliance criteria	Result
Visible defects	EN 1850 -2	-	Pass/Fail	Pass
Length	EN 1848-2	m	-10%/+10%	12.5
Width	EN 1848-2	m	-2.5%/+2.5%	4
Straightness	EN 1848-2	-	Pass/Fail	Pass
Thickness	EN 1849-2	mm	-12%/+12%	0.5
Tensile strength - MD	EN 12311	N/mm ²	MLV	15
Tensile strength - TD	EN 12311	N/mm ²	MLV	15
Tensile elongation - MD	EN 12311	%	MLV	400
Tensile elongation - TD	EN 12311	%	MLV	400
Joint strength	EN 12317-2	N	MDV	298
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	>MLV	200
Durability (artificial 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	333
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	335
Resistance to static loading	EN 12730	kg	MDV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	2100
Water vapour transmission - permeability	EN 1931	g/m ² /d	MDV	0.08
Radon permeability	SP Test Method	m ² /s	MDV	5.477x10 ⁻¹²
Radon transmittance	SP Test Method	m/s	MDV	5.477x10 ⁻¹²
Carbon dioxide permeability	ISO 2782	m/s/Pa	MDV	2.8x10 ⁻¹⁷
Methane permeability	ISO 2782	m/s/Pa	MDV	1.13x10 ⁻¹⁷
Reaction to fire	EN 13501-1	Class	MDV	F

Health and safety information

Refer to the Visqueen Low Permeability Gas Membrane material safety datasheet (MSDS).

Visqueen Low Permeability Gas Membrane

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.



APPENDIX D
GAS MEMBRANE VALIDATION INSPECTION PROFORMA

VISUAL INSPECTION OF GAS PROTECTION MEASURES

Site name:	
Job number:	
Date:	
Visit by:	
Weather at time of inspection:	
Gas characteristic situation:	
Type of development and building/block checked: (residential/commercial/other)	
Building description:	
Foundation type: (suspended floor/raft/other)	
Gas protection type: passive/active	

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 and joint seals	
1.7	Service entries seals	
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	
Additional notes:		

Notes: inspection checklist

1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material bath/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

The gas protection measures inspected:	a Are acceptable and comply with the specification
	b Are acceptable but attention is drawn to issues relation to item no. xxx
	c Are not acceptable due to the issues related to item no. xxx

Name:

Signature:

Date: