



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

M4NCHESTER ONE LIMITED

Spear Street, Manchester

Verification Plan for Ground Gas Protection Systems

LC/C5230/11820

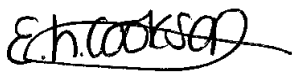
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PROJECT QUALITY CONTROL DATA SHEET

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1.0 INTRODUCTION

1.1 Objectives

This report describes a Verification Plan for Ground Gas Protection Systems produced by Brownfield Solutions Limited (BSL) for M4NCHESTER ONE LIMITED on a site off Spear Street, Manchester.

This document has been produced in accordance with BS 8485:2015+A1:2019 and CIRIA 735 (2014) which states that the Verification Plan forms an integral part of the design of the gas protection system to ensure and demonstrate that the systems are adequately installed.

The Verification Plan will set out:

-
- The need for, and scope of, inspection/verification.
 - Who will carry out the inspections (in terms of competence and independence).
 - Over what period and at what frequency these inspections will take place.
 - The elements of the gas protection system to be inspected.
 - How the inspections will be recorded and reported.
-

The Verification Plan should be presented to all relevant stakeholders who will be required to implement and consider ground gas protection systems within their duties as part of the development.

1.2 Proposed Development

The proposed development is for a five-storey structure containing 6 No. apartments and a ground floor commercial unit, as shown on the Site Plan- Ground Floor Plan.

1.3 Available Information

The following reports have been issued for the site and should be read in conjunction with this Verification Plan:

-
- Curtins, Phase I Preliminary Site Assessment Report, reference B063129.003/MH/8160, issued in May 2017.
 - BSL, Phase II Geo-Environmental Assessment Report, reference JEM/C5230/11723, dated January 2023.
-

We assume the above reports have been submitted to the relevant regulatory bodies and the assessments therein have been accepted for the purposes of this Verification Plan.

1.4 Limitations

BSL have provided advice on suitable options for ground gas protection systems, however we have not been involved in the design process and extend no professional liability in respect to design. However, we will confirm if the chosen designs are appropriate and will validate the system in accordance with the designs and confirm the required points have been achieved in accordance with BS8485.

We recommend the suitability of all designs are confirmed with the Local Authority and the Warranty Provider (if applicable) and / or Building Control prior to any irrevocable action at the site. If we feel the designs are incorrect, we have a duty of care to inform the Client.

This Verification Plan does not in itself constitute the actual verification that the gas membrane and protection systems have been installed in accordance with this document and therefore offers no warranty thereto.

There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by previous assessments and therefore not been taken into account by this Verification Plan. Responsibility cannot be accepted for such site conditions not revealed by the assessments.

This report has been prepared for the sole use of the client, M4NCHESTER ONE LIMITED. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report, they rely on it at their own risk and BSL do not owe them any Duty of Care. Should the Client require copies of the report to be passed to third parties for information purposes, then the whole report should be included without any omissions.

2.0 GROUND MODEL SUMMARY

2.1 Location

The site is located off Spear Street, Manchester, M1 1EJ. It is situated within the Northern Quarter of Manchester City Centre, centred on National Grid Reference 384640, 398610.

2.2 Site Description

The site is set within a mixed commercial and residential area, bordered by office buildings and paper works to the north. The site comprises an open area to the rear of the Koffee Pot Café. The site has recently been used as an al fresco dining area, surfaced with limestone gravel.

The site is generally flat however there is a retaining wall circa 2m high of masonry construction that comprises the southwestern boundary, above which is wooden fencing. The walls of the Koffee Pot Café and a Chinese health information centre make up the northwest and northeast site boundaries. The southeast boundary is comprised of wooden hoarding which was removed for the purposes of the site investigation works.

Historically, the site was originally host to a building which appears to have been used for bedding/clothes. By 2016 this had been demolished, with the site used as a car park. The surrounding land uses through time have included a gas works (over 650m away), canal 100m away, residential/commercial properties, tram lines, schools, mills, printing works (100m away), warehouses and a bus station south of the site.

2.3 Ground Conditions

A site investigation was undertaken between the dates of 30th November 2022 and 2nd December 2022 and a summary of the ground conditions is presented below:

Made Ground

Made ground was encountered within all the exploratory holes across the site and was observed from ground level to depths between 1.50m and 4.00m bgl. The base of the made ground was only proven at 4.00m bgl within the cable percussive borehole.

Gravel surfacing of cream fine to coarse limestone was present across the site recorded to be 0.10m thick, directly underlain by a blue plastic membrane.

The composition of the made ground beneath the blue plastic membrane was fairly consistent across the site and represented demolition material comprising gravelly sand with varying amounts of ash as a minor constituent. Cobbles and boulders of asphalt, brick and concrete ranged from low to medium content.

Natural Strata

The natural strata underlying the site was generally firm to hard clay with varying amounts of sand and gravel as minor constituents. This is interpreted to represent glacial Till and was proven to 18.91m bgl.

An isolated band of slightly gravelly sand was encountered from 17.40-18.00m bgl, below very stiff slightly gravelly sandy clay, and above hard slightly gravelly sandy clay.

Solid Geology

The solid geology of the Chester Pebble Beds Formation was not encountered in this investigation.

Groundwater

Groundwater was not encountered within any of the exploratory hole locations during this investigation.

2.4 Ground Gas

Rationale

In accordance with CIRIA C665, the ground gas generation potential at the site is considered to be **very low to low** (made ground). The sensitivity of the development is **low** on account of the proposed ground floor commercial unit. Based on this, and in agreement with the Manchester City Council, the CL:AIRE RB17 approach has been used to assess the risk of ground gas onsite.

Summary of Potential On-Site Sources and Pathways

The ground investigation carried out on site demonstrated the presence of made ground overlying natural cohesive soils across the site. This made ground is inferred to be a result of the infilling of a previous basement structure and was proven to a maximum depth of 4.00m bgl.

No other viable on-site potential ground gas sources have been identified.

Assessment of Data

The made ground on site generally comprised demolition material with anthropogenic constituents comprising predominantly brick, concrete and sandstone, with minimal degradable or organic matter. Chemical testing indicates that the made ground soils have total organic carbon (TOC) contents ranging from 1.3% to a maximum of 1.8%.

The proposed development requires a piled foundation solution due to the depth of made ground onsite and magnitude of imposed structural loads, and the construction of this building may require the excavation of some of this material which would therefore reduce the thicknesses of the made ground present. Additionally, there is a requirement for a suspended floor slab with a minimum ventilation void of 150mm which also provides a degree of ground gas protection within the building.

Taking into consideration the above, based on Table 1 in RB17, this indicates that where sites have a maximum 5.00m thickness of made ground, with materials in place for more than 20 years and with TOC contents of up to 3%, that a Characteristic Situation of CS2 should be considered appropriate.

Assessment Summary

Based on the thickness and TOC content of made ground soils present at the site, ground gas protection measures are required in line with CS2 conditions.

3.0 PROPOSED PROTECTION SYSTEMS

To comply with the required level of protection and in accordance with BS8485:2015 for a Type B building placed within CS2, a minimum of 3.5 points is required. The gas protection system should consist of at least 2 separate elements including a structural barrier, ventilation systems and/or a gas resistant membrane.

For a Type B building falling within CS2 the following gas protection systems are proposed in line with BS 8485:2015:

- A gas resistant membrane which is suitably impervious to carbon dioxide and methane and verified in accordance with CIRIA C735 - 2.0 score.
- A cast in-situ monolithic reinforced suspended floor slab with minimal penetrations (1.5 score depending on construction quality).

The drawings as produced by FCH for M4NCHESTER ONE LTD indicating the installation of the proposed ground gas protection systems within the proposed structure(s) are presented in Appendix A.

Structural Barrier

A structural barrier of the floor slab, comprising a reinforced cast in situ floor slab (no open void) with minimal penetrations will be used.

Gas Resistant Membrane

The products proposed for use in construction on the provided drawings is the Visqueen Ultimate HC Bloc membrane, Visqueen Ultimate Gas DPC, Visqueen Ultimate Geoseal and Visqueen Gas Resistant DPM. This is accompanied by double sided butyl tape and detailing strips. The product data sheets, indicative installation details and manufacturer methods of installation are presented in Appendix B. We note that alternative products and systems are available and may be used subject to confirmation from BSL and the Local Authority, some suggestions are provided below:

Architect Proposed Product	Suitable Alternatives	Location
Visqueen Ultimate HC Bloc	Visqueen Gas Barrier (VOC resistance is not required). JUTA GP1 or GP2. Dellate Membranes MemTech Pro M1 Ground Gas Membrane.	Below floor slab.
Visqueen Gas Resistant Self Adhesive Membrane and Ultimate Geoseal	JUTA GP1 SAM.	Lift pit base and walls.

Where products used on site are identified to differ from the above or not meet expectations, then the verifier would classify this as a non-conformance, or if it is deemed that the non-conforming product is of a suitable specification to the original specified product, a variation of the specification will be required from the designer. This may also need to be agreed with the Local Authority and / or warranty provider.

Suitability of Proposed System

The above proposed system totals 3.5 points, which meets minimum requirements. BSL therefore confirm the proposed protection system meets requirements.

Whilst there is no specific pressure relief pathway, the presence of any service trenches beneath the building footprint, which will be filled with gravel, will in effect provide an inherent pressure relief pathway (adding an additional 0.5 score).

4.0 VERIFICATION INSPECTION REGIME

4.1 Pre-Verification

Stakeholders

The key project stakeholders are listed below:

Client	Designer(s)	Installer	Verifier	Regulators
M4NCHESTER ONE LTD	Falconer Chester Hall Architects	TBC	Brownfield Solutions Ltd (BSL)	- Manchester City Council (regulator - Human Health risk and planning consent) - Building control.

Pre-Start Meeting and Requirements

Prior to installation, a pre-starting meeting should be held to discuss requirements between the installer, the verifier and site managers. This should help mitigate delays during the verification process.

The installer will be checked by the verifier (BSL) as to why they are considered appropriate to undertake the role, prior to construction. To aid this, the installer should provide their RAMS to BSL for records. Evidence of any qualifications and past experience will be required to be provided to BSL prior to installation and should be checked on site.

Attendance for verification is required prior to the placement of any construction over the installed membrane (e.g. before laying insulation or a concrete pour).

Due to the nature of the proposed development, the installed protection systems will be verified in as they become available, closely liaising with the site manager in regard to progress.

Records of installation shall be maintained by the verifier and installer and once all proposed installations are complete, a copy of the records will be issued within a separate Verification Report.

4.2 The Installer

The ground gas protection system will be installed as per the manufacturers recommendations, the design drawings and the installers method statements.

Prior to the installation of protection system, all on site personnel should be made aware of the presence of the installed membrane and should be informed that damage needs to be prevented. Adequate protection of the gas membrane (appropriate to the build sequences of follow-on trades and the robustness of the gas membrane used) will always be required to ensure that installed gas membranes have retained their integrity. A warning label to display and assist is included in Appendix E.

It is essential that an appropriately experienced and qualified workforce is employed on site to install ground gas protection systems.

The site is assessed intermediate risk CS2 (without venting systems to be installed), therefore a general builder/groundworker with relevant experience, but no relevant formal qualification in gas membrane installation could be employed. However, the verifier (consultant or qualified and experienced installer) will be required to conduct a thorough verification (visual) inspection prior to all concrete pours. In addition, all joints, pipe penetrations etc should be independently air lanced to ASTM D4437. As the new building is a single structure, integrity testing should be carried out alongside visual inspections.

The installer will also be required to maintain their own records of installation, which will include sign off sheets detailing areas and dates of installation alongside photos of before, during and after installation. This information is required by BSL to be included in our Verification report.

The installer shall notify the independent verifier of progress so that they can visit site and conduct verification in accordance with above scope.

4.3 The Independent Verifier

The installation of the ground gas protection systems shall be visually inspected and verified by an independent and suitably competent ground engineering professional or third party independent qualified and experienced installer. The competence of BSL verifiers is presented in Appendix C.

It will be necessary for the verifier to attend site prior to the installation of the membrane in order to discuss requirements and view the floor slab construction/ventilation systems. Note that prior to attending site, the verifier will require each area ready for inspection to be free of overlap/lapping tape on all seams where applicable during the visit.

When installed, the verifier will check the membrane used meets the requirements set out within this Verification Plan.

Edges, walls, pillars, service entries etc. will be checked that they have enough overlap in accordance with the manufacture's specification. The inspection should cover floor areas, paying attention to walls and any other locations where venting systems might be positioned. Areas where the membrane may be bridging across unsupported will be checked. Any discrepancies with the design drawings should be highlighted.

BSL reserves the right to increase levels of inspection should the quality of installation of the membrane deteriorate significantly over any phase of the construction works.

During the inspections, photographs will be taken as evidence and a pro forma check sheet will be used to record the assessment of the installation of the required ground gas precautions. A plan detailing which areas of the structure have been installed/verified shall also be maintained. A copy of the pro forma is presented in Appendix D.

Repairs should be instructed and observed on the same day as the site visit or re-inspected later.

Systems taken to minimise any damage to membranes whilst working (e.g. placement of insulation) will also be recorded and reported. A warning label to display and assist is included in Appendix E.

4.4 Integrity testing

Integrity testing should be carried out based on the requirements within Section 4.2. All joints, pipe penetrations etc should be independently air lanced to ASTM D4437. Integrity testing should initially be carried out on say 25 to 50 percent of pours then falling to 10 to percent if acceptable results obtained and no concerns raised by visual inspections.

In addition, mechanical point stressing to ASTM D4437-08:2013) will be carried during the visual inspection which involves running a blunt instrument (e.g. a blunted pick) along the edge of the seam to identify any unbonded seams. The instrument used should not puncture the gas membrane. This method is less appropriate for materials that are easily punctured where an air lance test is more suitable (although if a gas membrane can be easily punctured its suitability as a gas membrane is open to question).

Integrity testing is not a substitute for well designed and installed gas protection systems. When used, integrity testing should always be combined with visual inspection.

4.5 Non-Conformances

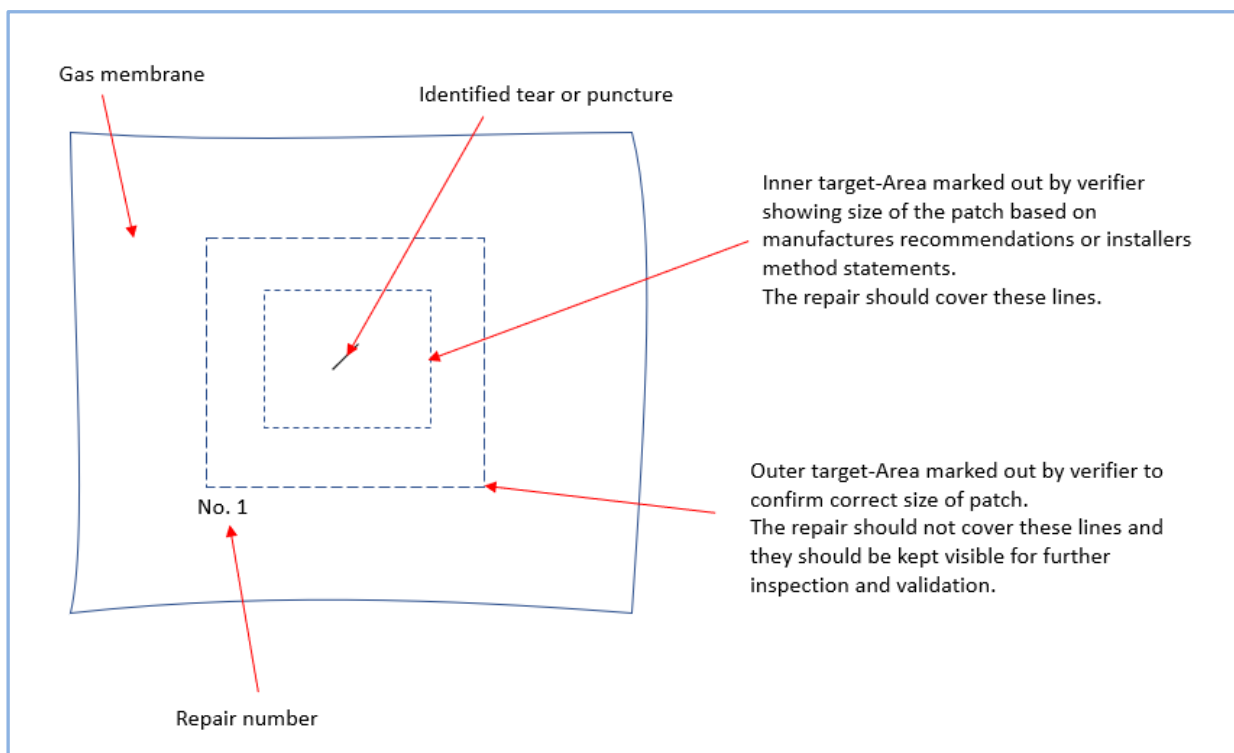
If installed incorrectly or damaged during the construction process, the membrane is rendered ineffective and will fail to provide adequate protection against the ingress of ground gas or vapours.

All damaged areas should be repaired in accordance with the manufacturer's instructions/installers method statements, ensuring a minimum lap is maintained and the repair subsequently verified. No bridging of unsupported membrane is permitted.

The following procedure will apply for any identified non-conformances:

- Damaged areas will be marked on site using a permanent marker (e.g. BSL, date, initials) and photographed to be included in the final verification report.
- The mark will highlight the area to be patched or repaired, maintaining a suitable lap.
- Verbally inform the installers on site of the repair(s) for them to address.
- When repaired, the area(s) will then be inspected again (re-verified).
- Once repaired to a satisfactory standard, a second mark will then be placed outside of the highlighted area to indicate the location of the repair (e.g. BSL, date, initials, repaired and a tick mark) with photographic evidence of the repair taken to be included in the final verification report.
- If there are a very high number of non-conformances and installation is generally very poor, do not attempt to identify all non-conformances; stop works and discuss the issues with the installer and the site manager. Indicate that the installation is not to a satisfactory standard and that further training should be provided prior to continuing installation, with re-verification once addressed.
- Where repairs can be reasonably achieved during the allotted time available for the inspection visit, then re-verification be conducted. Where this cannot be achieved; additional visits will be required.

The below diagram provides a sketch of typical repair requirements:



Following each inspection visit, the verifier will provide a verbal summary of their findings to the site manager and/or client.

It should be noted that on rare occasions, the BSL engineer carrying out the verification works may accidentally cause damage to the membrane during the verification visit by walking over the membrane. This typically occurs when the underside of the membrane has not been suitably cleared of debris prior to laying. Should this occur then a non-conformance will be recorded, and a repair will be required. BSL and the engineer in attendance shall not be held accountable for such damage unless it is proven to have been deliberate.

A time allowance should be made during the construction phase to address non-conformance highlighted during inspection. Incorrect installation may have an impact on timescales for concrete pours and subsequent follow on works, therefore good workmanship is essential to save on time and potential additional costs/delays.

If changes to the development design or installers method statement take place during construction, then these changes must be communicated to the verifier to ensure requirements continue to be met.

Gross non-conformance (e.g. inaccurate records or no records of installation whatsoever) may result in not achieving regulatory sign off, which may have significant financial implications.

Note that any form of abusive or threatening behaviour, deception, bribery or other corruptive activity towards BSL and its staff before, during or after verification activities will potentially result in our services being suspended with immediate effect and withdrawn where such activity has been shown to have occurred.

4.6 Post Verification

Once the installed membrane has been verified and all non-conformances addressed, it will be considered acceptable. Once acceptable the membrane should be protected from follow on trades as best as possible (e.g. placement of insulation over the membrane to avoid damage). Any damage to the membrane after this will render the gas protection systems unsuitable and BSL should be advised immediately. Repair works and re-verification may be required in that instance.

It is not the Verifier or the Installers responsibility to ensure that all follow-on works are aware of the risk to damage to the gas protection systems present at the site.

The importance of the membrane will need to be communicated to all site personnel during the site induction. It is recommended that the Warning Notice provided in Appendix F is displayed in a number of clear locations to indicate the presence of the membrane and to avoid damage to this element.

We also strongly recommend that any follow-on trades responsible for preparing sub-base surfaces for gas protection systems are made aware of finishing requirements. Damage to the installed membrane can be minimised by providing toolbox talks given to follow on trades and by the use of sacrificial protection layers applied where traffic across the exposed membrane is necessary.

Note that if damage is caused to a gas protection system by follow on trades post verification and BSL observe this, then BSL reserves the right to retract any Verification Report until suitable repairs are completed and revalidated.

5.0 VERIFICATION REPORTING

5.1 Report contents

The final report is a concise document that relates to the history of the ground gas protection system installation process. The final report should contain:

-
- A description of the inspection regime.
 - A description of the elements of the ground gas protection system.
 - A presentation of the material specifications etc.
 - Dates of inspection, inspection staff present, weather conditions and the surrounding trades activity.
 - Specifics relating to the level of training, competency and accuracy of the installation team.
 - Installation photos.
 - Recognised defects and repairs.
 - Areas inspected along sectors and grid lines if appropriate.
 - Areas of limitation: areas unable to be inspected, identified and noted.
 - Records of CPD and any certifications that the verifier holds (staff competency).
-

The final verification report will need to be submitted to the regulators to obtain regulatory sign off for the works undertaken.

6.0 REFERENCES

BS 8576:2013 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'.

BS 8485:2015+A1:2019 'Code of practise for the design of protective systems for methane and carbon dioxide ground gases for new buildings' 2019.

Card & Steve Wilson in 'A pragmatic approach to ground gas risk assessment for the 21st Century'- CIRIA/Environmental Protection UK Ground gas seminar 2011.

CIRIA 149 'Protecting development from methane' 1995.

CIRIA 150 'Methane Investigation Strategies' 1995.

CIRIA 151 'Interpreting measurements of gas in the ground' 1995.

CIRIA 152 'Risk assessment for methane and other gases from the ground' 1995.

CIRIA 552 'Contaminated Land Risk Assessment – A guide to good practice' 2001.

CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' 2007.

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

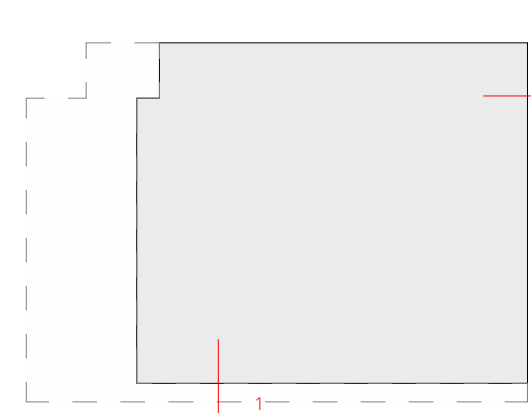
CIRIA C748 'Guidance on the use of plastic membranes as VOC vapour barriers' 2014.

Wilson & Card 'Proposed method classifying gassing sites' Ground Engineering 1999.

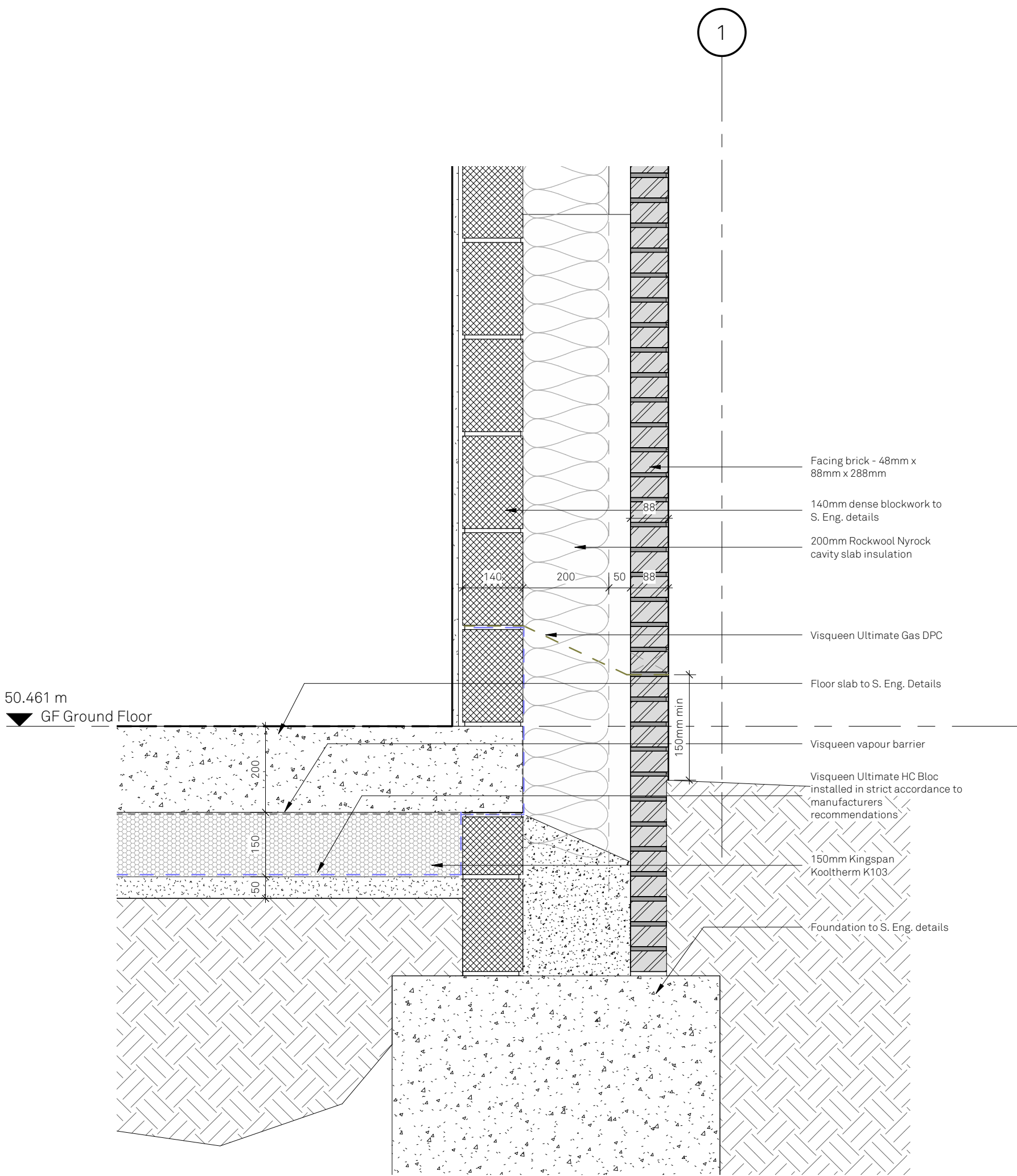
YALPAG Technical Guidance for Developers, Landowners and Consultants, Verification Requirements for Gas Protection Systems. "JNJJN"

APPENDIX A

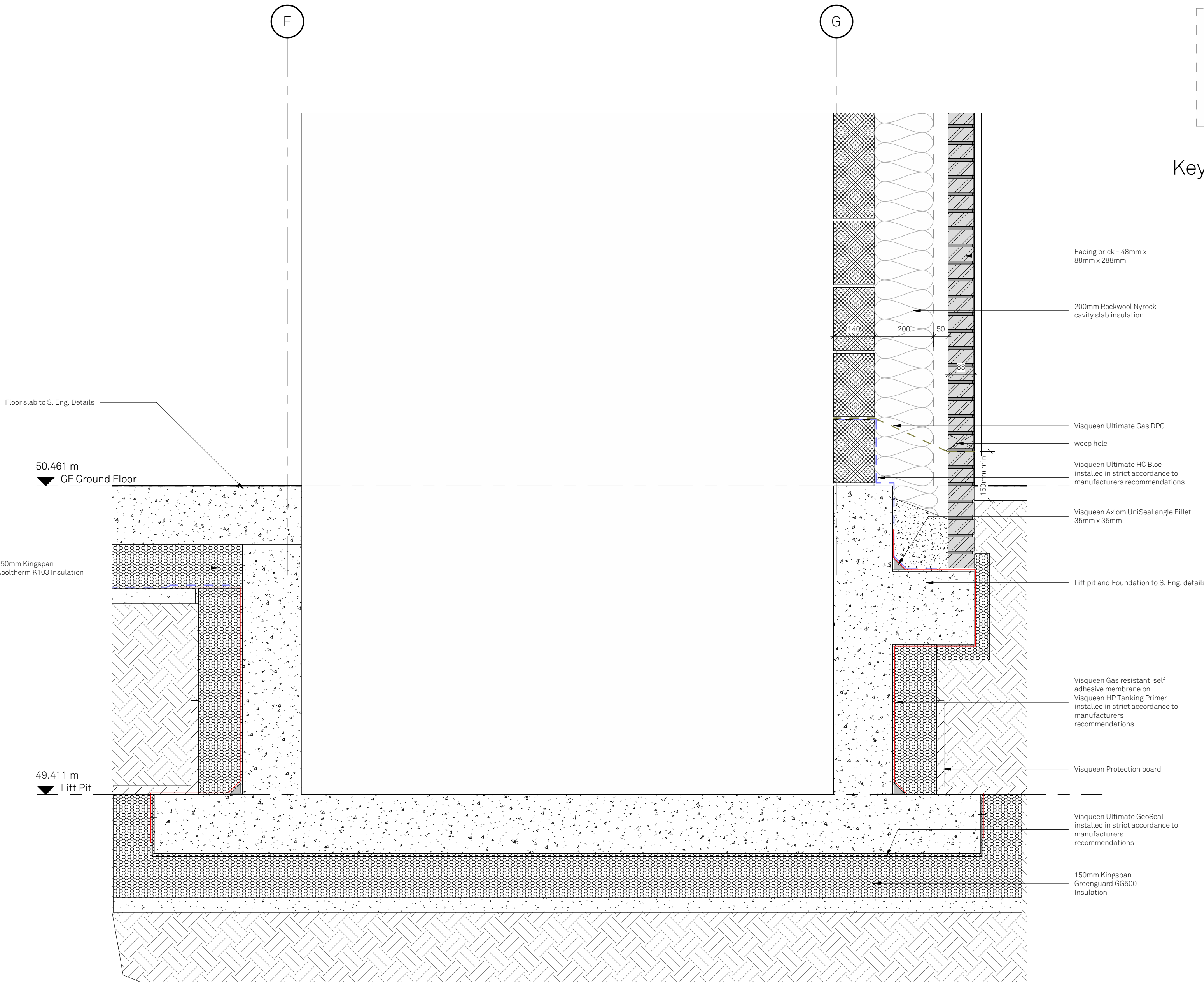
Drawings Detailing Gas Protection Systems



Key Plan Slab Edge Sections



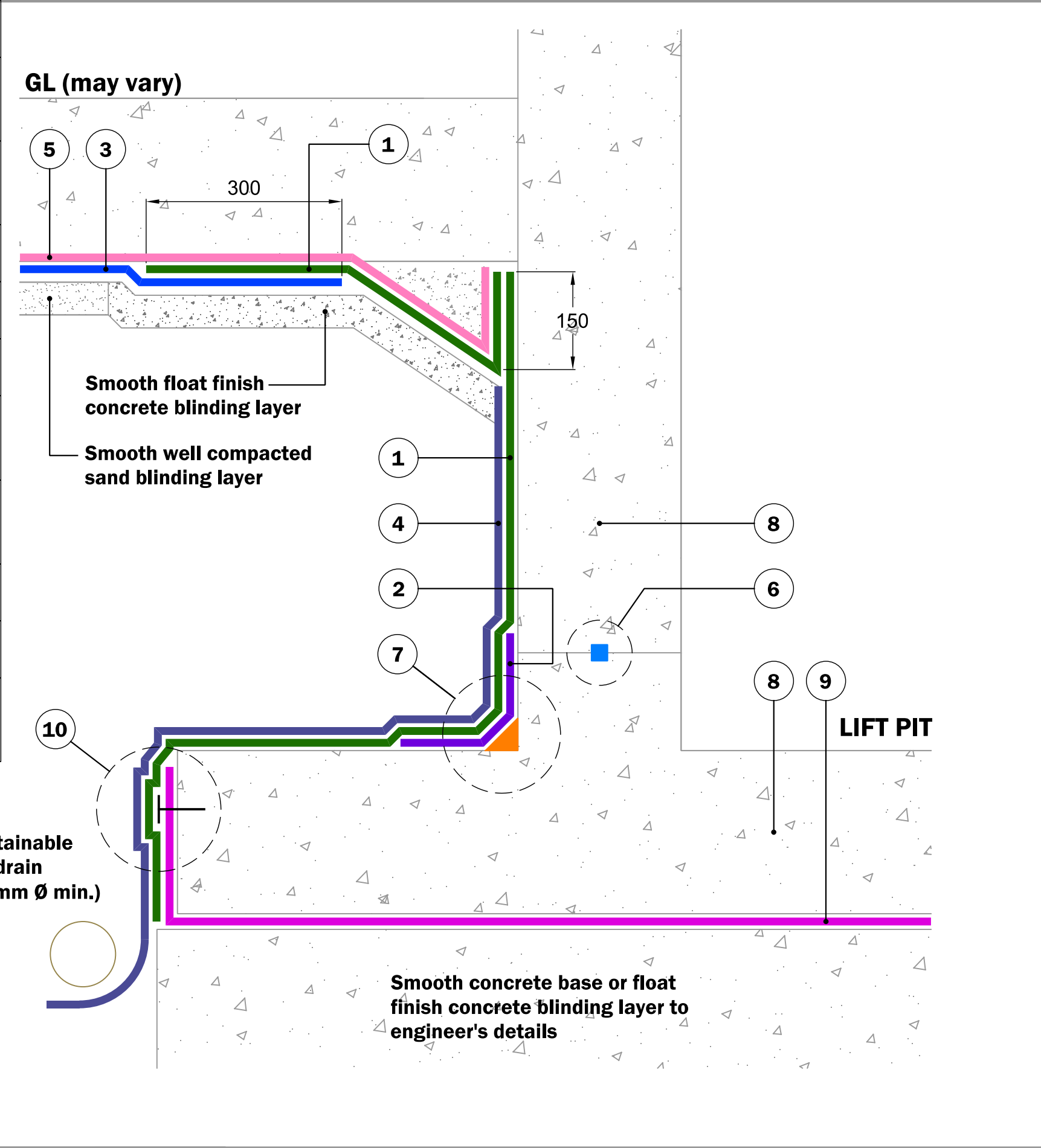
Typical Slab edge / waterproofing
Scale @ 1 : 10



Lift Pit waterproofing
Scale @ 1 : 10

P2	28.03.23	RE	GJ	Updates to waterproof membrane details and specification
P1	16.03.23	RE	GJ	First Issue
Rev	Date	By	Chk	Description

KEY TO MATERIALS :-	
1	Visqueen Gas Resistant Self Adhesive Membrane on Visqueen HP Tanking Primer.
2	Visqueen Pro 300mm / 500mm Detailing Strip on Visqueen HP Tanking Primer.
3	Visqueen Gas Barrier.
4	Visqueen Protect&Drain 12mm.
5	Visqueen TreadGUARD 300 or 1500.
6	Visqueen IGW Waterstop bedded in Visqueen Waterstop Adhesive.
7	Visqueen Axiom UniSeal Angle Fillet (35mm x 35mm).
8	Visqueen IGW watertight concrete.
9	Visqueen Ultimate GeoSeal.
10	Visqueen Retaining Discs @ 400mm centres.



Important Note :-
Further protection such as ventilation measures (not shown) will be necessary to meet the requirements of BS 8485:2015+A1:2019.

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Detail issued for Guidance Only. Designer's Approval Required.

Site construction sequencing should be assessed before the appropriate Visqueen Standard Detail is selected & approved by the Designer.

The Designer must ensure that the minimum gas protection score is achieved in line with the guidance given in BS 8485:2015+A1:2019.

In order to develop a robust design for protecting a structure against groundwater, a Risk Assessment must be carried out in line with the guidance given in BS 8102:2022

The Designer may need to specify one or a combination of waterproofing measures.

DPCs and DPC cavity trays to be installed in accordance with BS8215:1991 and PD6697:2019.

All Visqueen materials must be installed in strict accordance with the manufacturer's instructions. Refer to the current Visqueen datasheets.

Do Not Scale, Use Figured Dimensions only. All figured dimensions are in mm.

(Revision: Berry UK Design Centre)

Standard Detail



www.visqueen.com

Scale : NTS

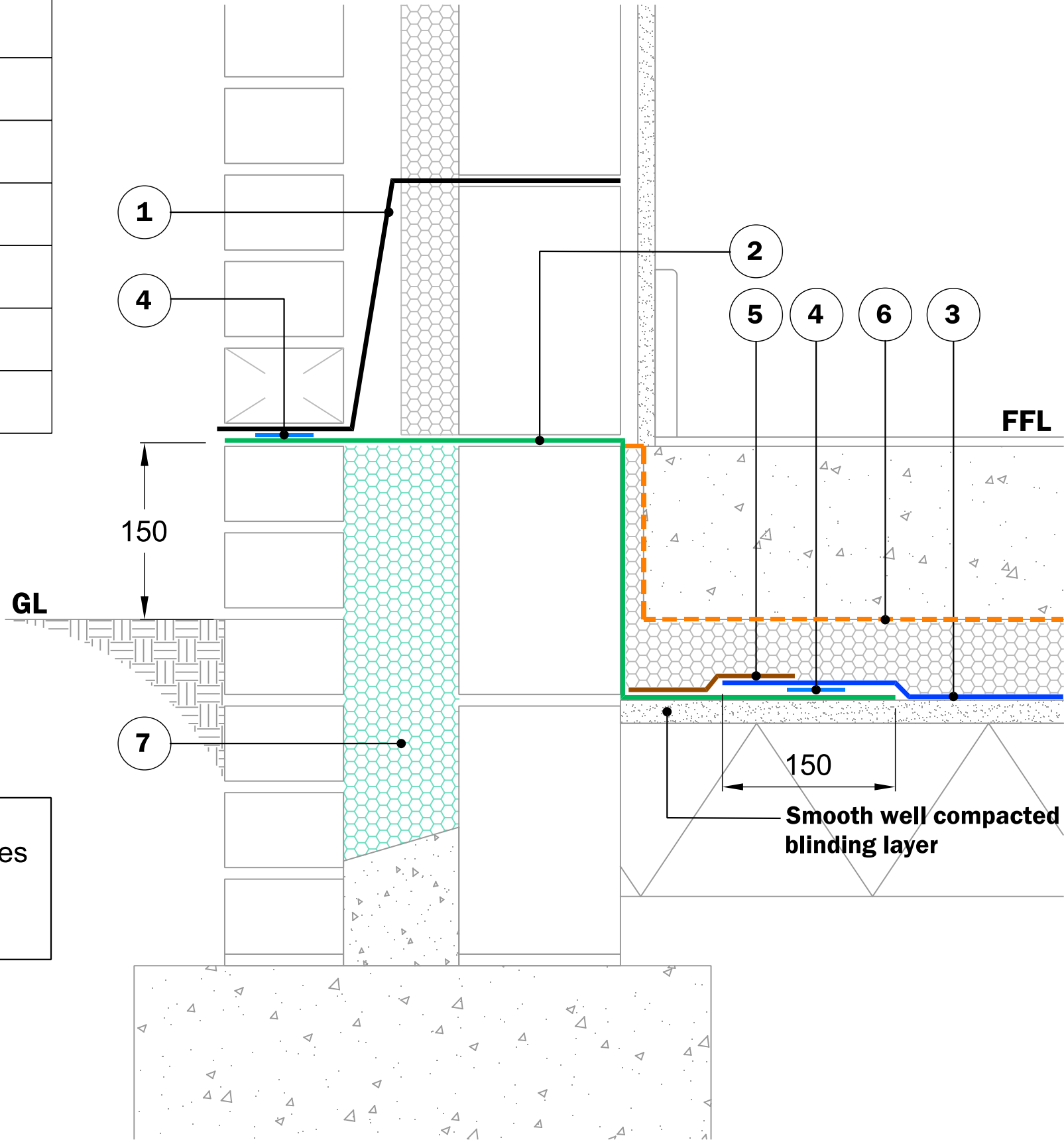
Date : July 2022

Drawing No : TGB-01

Revision Status : 0

KEY TO MATERIALS :-	
1	Visqueen Zedex CPT DPC.
2	Visqueen Ultimate Gas DPC.
3	Visqueen Gas Barrier.
4	Visqueen Double Sided Tape (10m x 50mm).
5	Visqueen Gas Resistant Foil Tape.
6	Visqueen Vapour Barrier or HP Vapour Barrier.
7	Rigid insulation by others to support gas DPC.

Important Note :-
Further protection such as ventilation measures (not shown) will be necessary to meet the requirements of BS 8485:2015+A1:2019.



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(Revision: Berry UK Design Centre)

Standard Detail



www.visqueen.com

Scale : NTS

Date : March 2022

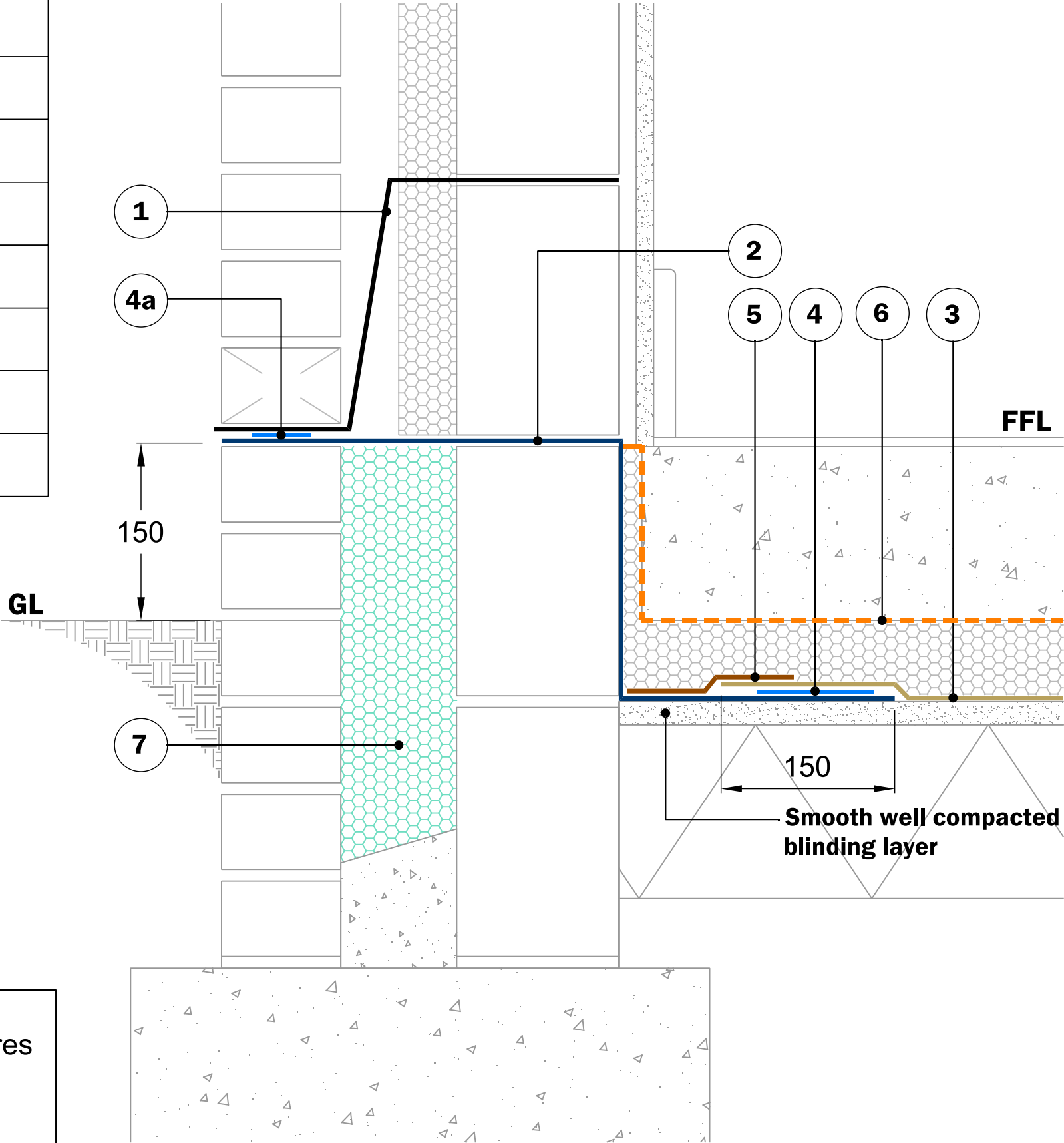
Drawing No : GB-21



Typical Edge Detail - Ground Bearing Slab.

VISQUEEN
0333 202 6800
www.visqueen.com
enquiries@visqueen.com

KEY TO MATERIALS :-	
1	Visqueen Zedex CPT DPC.
2	Visqueen Ultimate Gas DPC.
3	Visqueen Ultimate HC BLOK.
4	Visqueen Ultimate Double Sided Tape.
4a	Visqueen Double Sided Tape (10m x 50mm).
5	Visqueen GR Lap Tape.
6	Visqueen Vapour Barrier or HP Vapour Barrier.
7	Rigid insulation by others to support gas DPC.



Important Note :-

Further protection such as ventilation measures (not shown) may also be necessary. Contact Visqueen for further information.

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Detail issued for Guidance Only. Designer's Approval Required.

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Do Not Scale, Use Figured Dimensions only. All figured dimensions are in mm.

(Revision: Berry UK Design Centre)

Standard Detail



www.visqueen.com

Scale : NTS

Date : August 2022

Drawing No : HC-21

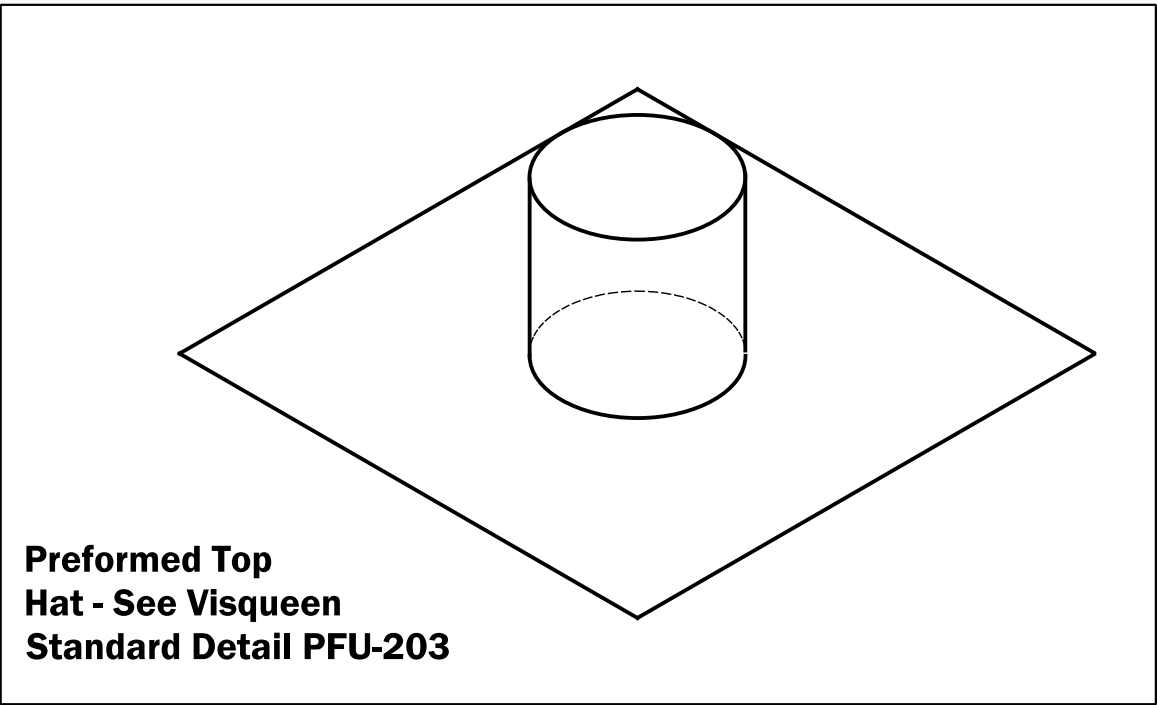
Revision Status : 0



Typical Edge Detail - Ground Bearing Slab.

VISQUEEN
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enquiries@visqueen.com

KEY TO MATERIALS :-	
1	Visqueen Ultimate Preformed Top Hat.
2	Jubilee clip.
3	Visqueen Ultimate HC BLOK.
4	Visqueen Ultimate Double Sided Tape.
5	Visqueen GR Lap Tape.
6	Visqueen Vapour Barrier or HP Vapour Barrier.
7	Visqueen TreadGUARD 300 or 1500.



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Detail issued for Guidance Only. Designer's Approval Required.

Site construction sequencing should be assessed before the appropriate Visqueen Standard Detail is selected & approved by the Designer.

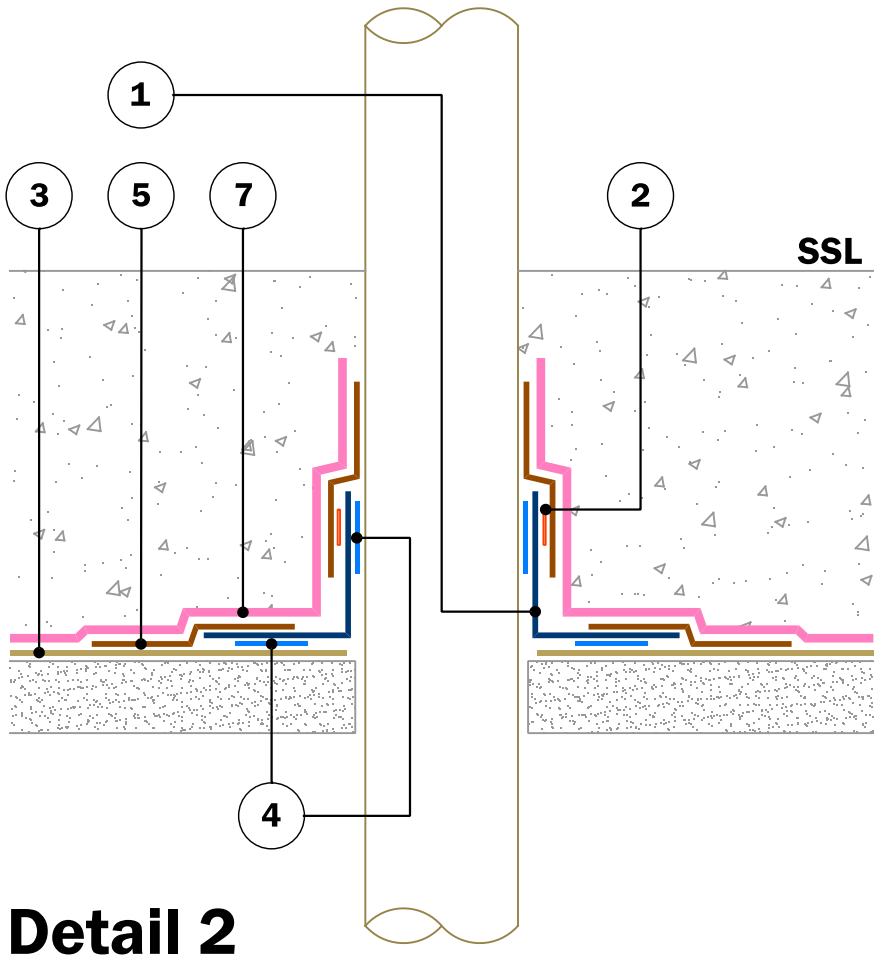
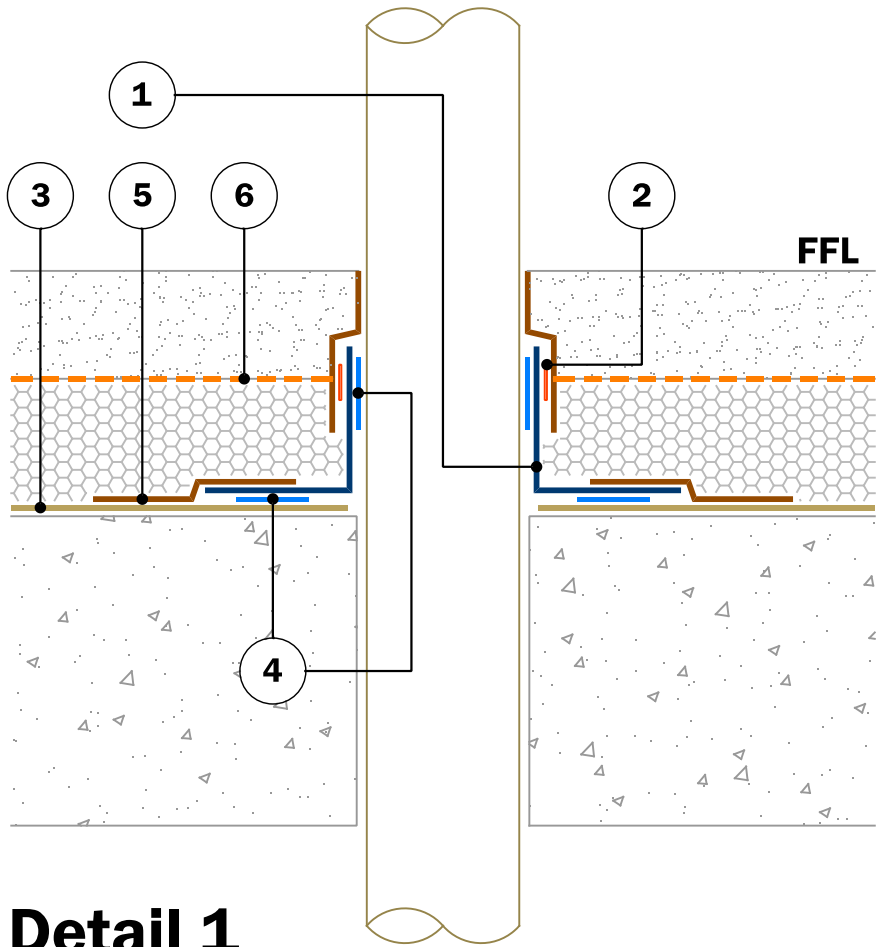
In order to develop a robust design for protecting a structure against groundwater, a Risk Assessment must be carried out in line with the guidance given in BS 8102:2022.

The Designer may need to specify one or a combination of waterproofing measures.

DPCs and DPC cavity trays to be installed in accordance with BS8215:1991 and PD6697:2019.

All Visqueen materials must be installed in strict accordance with the manufacturer's instructions. Refer to the current Visqueen datasheets.

Do Not Scale, Use Figured Dimensions only. All figured dimensions are in mm.



(Revision: Berry UK Design Centre)

Standard Detail



www.visqueen.com

Scale : NTS

Date : April 2022

Drawing No : HC-51



Typical Pipe Sleeve Details (Top Hat).

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KEY TO MATERIALS :-	
1	Visqueen Ultimate HC BLOK.
2	Visqueen Ultimate Double Sided Tape.
3	Visqueen GR Lap Tape.
4	Visqueen Pro Detailing Strip (300mm or 500mm x 10m).

Step 1.

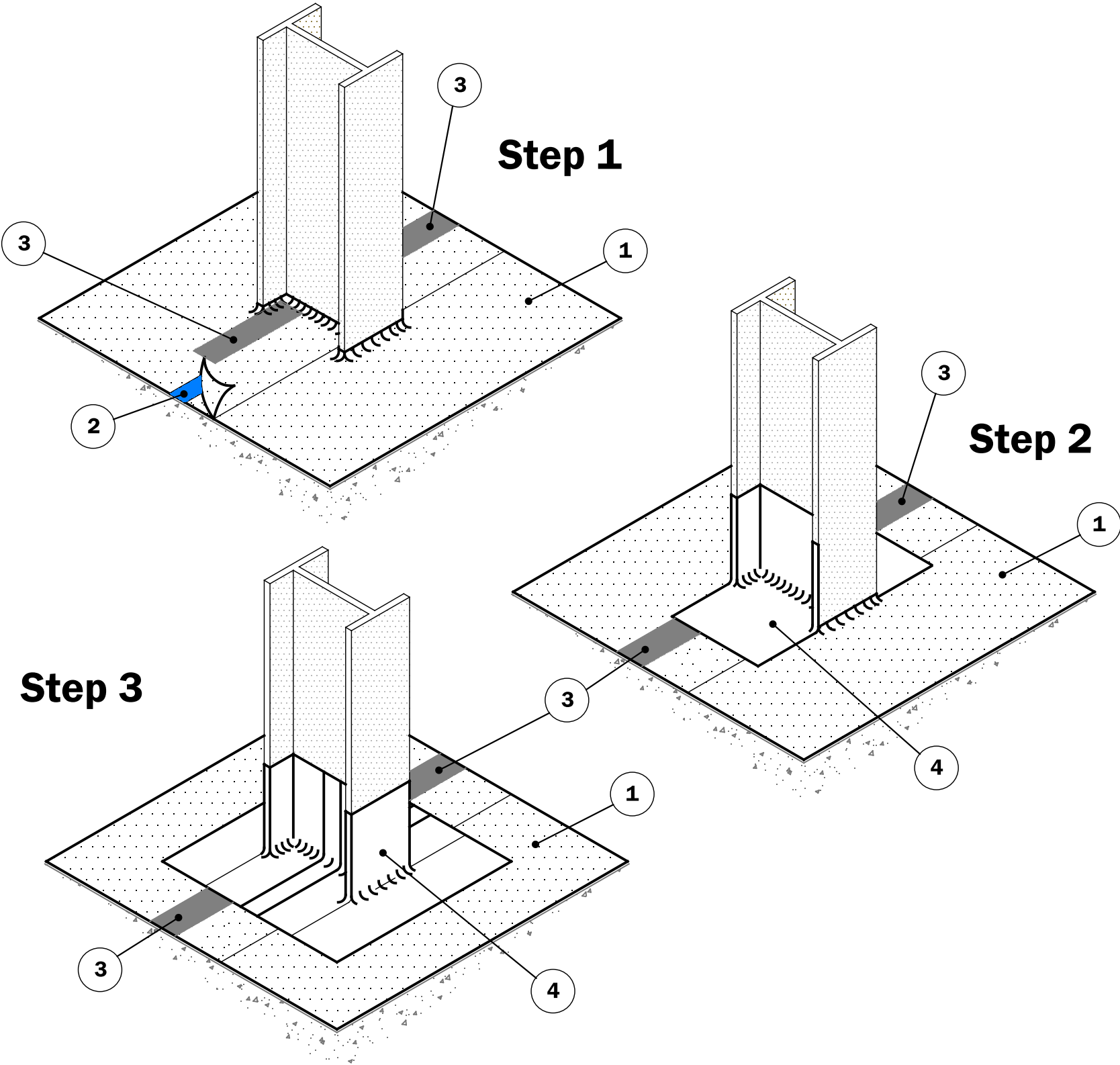
Install Visqueen Ultimate HC BLOK on a suitable smooth & well compacted blinding layer. All laps to be 150mm minimum & fully sealed using Visqueen Ultimate Double Sided Tape & Visqueen GR Lap Tape. Neatly cut the barrier around the profile of the steel column.

Step 2.

Ensure steelwork is clean & dry before applying Visqueen Pro Detailing Strip (300mm or 500mm). Ensure that the Detailing Strip extends 150mm minimum horizontally onto the DPM & 150mm minimum vertically onto the steel column. Ensure all laps are fully sealed.

Step 3.

Apply more Detailing Strip to the remaining exposed steel flanges ensuring all laps are 150mm in all directions & fully sealed.



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Detail issued for Guidance Only. Designer's Approval Required.

Site construction sequencing should be assessed before the appropriate Visqueen Standard Detail is selected & approved by the Designer.

In order to develop a robust design for protecting a structure against groundwater, a Risk Assessment must be carried out in line with the guidance given in BS 8102:2022.

The Designer may need to specify one or a combination of waterproofing measures.

DPCs and DPC cavity trays to be installed in accordance with BS8215:1991 and PD6697:2019.

All Visqueen materials must be installed in strict accordance with the manufacturer's instructions. Refer to the current Visqueen datasheets.

Do Not Scale, Use Figured Dimensions only. All figured dimensions are in mm.

(Revision: Berry UK Design Centre)

Standard Detail



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Scale : NTS

Date : April 2022

Drawing No : HC-52



Typical Internal Steel Column Sealing Details (Slab Junctions Only).

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APPENDIX B

Gas Protection Systems Datasheets

Visqueen Ultimate HC BLOK

Features and benefits

- Agreement certified - third party accreditation
- Complies with CIRIA C748:2014 - industry standard for volatile organic compounds (VOC) protection
- 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 Ultimate HC Blok is a 0.5mm thick, chemically resistant co-extruded volatile organic compound barrier and gas barrier. It is coloured gold on the upper surface and white on the reverse. The product is supplied in single wound rolls (not folded), 2.44m x 41m.

Approvals and standards

- Third party accreditation (BDA certificate BAF-18-051-P-A-UK)
- Complies with CIRIA C748:2014
- 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 13967:2012
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

Usage

Visqueen Ultimate HC Blok is suitable for use in all types of buildings to prevent the ingress of harmful levels of volatile organic compounds (VOCs). 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.

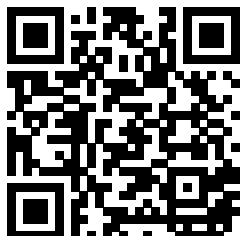
The barrier can also be used in all types of buildings to prevent the ingress of harmful levels of ground gases e.g. methane, carbon dioxide and radon. The barrier also acts as a damp proof membrane. In this application, the barrier can be positioned above or below a solid concrete ground floor slab or above a precast suspended segmental ground floor system, e.g. beam and block floor.

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

System components

- Visqueen Ultimate Double Sided Jointing Tape, 100mm x 15m
- Visqueen GR Lap Tape, 150mm x 10m
- Visqueen Ultimate Top Hat Units
- Visqueen Preformed Units
- VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m

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NEW
VISQUEEN CLASS B FR
 VAPOUR CHECK

- Visqueen Class B FR Vapour Check is a fire resistant AVCL (air and vapour control layer)
- Surpasses all national Building Regulations and Standards for air and vapour control layers
- Fire classification B - s1, d0
- Competitive, efficient and fully tested system (including tapes) for fire resistance

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 PRODUCT FROM VISQUEEN

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Visqueen Ultimate HC BLOK

Storage and handling

Visqueen Ultimate HC Blok 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

In VOC applications, Visqueen Ultimate HC Blok should be installed on a smooth continuous surface free from irregularities such as voids or protrusions e.g. grouted beam and block floor.

In ground gas 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 Ultimate HC Blok should be loose laid on the substrate with the gold 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 Ultimate Double Sided Jointing Tape and sealed with Visqueen 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 Ultimate 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 Ultimate Double Sided Jointing Tape and sealed with Visqueen GR 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 Ultimate 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 Ultimate Double Sided Jointing Tape and sealed with Visqueen GR 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 Ultimate HC Blok and all associated system components should not be installed below 5°C.

Additional information

When used in accordance with CIRIA C748:2014 or BS8485:2015 + A1:2019, a subfloor ventilation system or pressure relief maybe required

To assist build sequencing, Visqueen Ultimate Gas DPC is available for gas protection through the wall constructions.

For suspended beam and block floor detailing see HC-01

Visqueen Ultimate Preformed Top Hat Units should be used at service pipe penetrations see HC-51

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

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

Visqueen Ultimate HC BLOK

Property	Test method	Units	Criteria	Result	
Colour				Gold/white	
Weight		kg		49	
Length	EN 1848-2	m	-0/+10%	41	
Width	EN 1848-2	m	-0/+10%	2.44	
Thickness	EN 1849-2	mm	+/-10%	0.5	
BS 8485:2015 and C748:2014 physical test results		Units	Criteria	Result	
Puncture	BS EN ISO 12236:2006	N	MDV	1640	
Impact resistance Method A hard surface	EN 12691	mm	MDV	200	
Impact resistance Method B soft surface	EN 12691	mm	MDV	1250	
Tensiles yield strength MD 1	ASTM D4885-01	kN/m	MDV	5.1	
Tensiles yield strength CD 1	ASTM D4885-01	kN/m	MDV	4.91	
Yield elongation MD 1	ASTM D4885-01	%	MDV	76	
Yield elongation CD 1	ASTM D4885-01	%	MDV	62	
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	60.2	
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	66.1	
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	48.7	
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	49.6	
1 - this is at yield and not break as the equipment used was not strong enough to break the membrane					
BS 8485:2015 - Methane testing	Test method	Units	Criteria	Result	
Methane permeability unjointed	ISO 15105-1	ml/m ² /d/atm	<40	1.3	
Methane permeability welded joint	ISO 15105-1	ml/m ² /d/atm	<40	24	
Carbon dioxide	ISO 15105-1	ml/m ² /d/atm	<40	8.3	
C748:2014 - Permeation vapour tests - 100% concentration		Criteria	ml/m ² /d	mg/m ² /d	mg/m ² /hr
Benzene	ISO 15105-2	MDV	0.08	70	2.92
Toluene	ISO 15105-2	MDV	0.09	78.5	3.27
Ethyl benzene	ISO 15105-2	MDV	0.11	93.8	3.91
m,p xylene	ISO 15105-2	MDV	0.01	6.7	0.28
Hexane	ISO 15105-2	MDV	gas	2.6	0.11
Vinyl chloride	ISO 15105-2	MDV	0	6.4	0.27
Tetrachloroethene (PCE)	ISO 15105-2	MDV	0	3.2	0.13
Trichloroethene (TCE)	ISO 15105-2	MDV	solid	0.3	0.01
Naphthalene	ISO 15105-2	MDV	0.03	19.7	0.82
C748:2014 - Chemical immersion testing		weight %	Thickness %	Tensiles/elongation	
Pass is achieved if the aged membrane is within 25% of the fresh sample					
Benzene	EN 14414	Pass	Pass	Pass	
Toluene	EN 14414	Pass	Pass	Pass	
Ethyl benzene	EN 14414	Pass	Pass	Pass	
(m,p, and o) xylene	EN 14414	Pass	Pass	Pass	

Visqueen Ultimate HC BLOK

Property	Test method	Units	Criteria	Result	
Hexane	EN 14414	Pass	Pass	Pass	
Vinyl chloride	EN 14414	Pass	Pass	Pass	
Tetrachloroethene	EN 14414	Pass	Pass	Pass	
Trichloroethene	EN 14414	Pass	Pass	Pass	
Naphthalene	EN 14414	Pass	Pass	Pass	
CE Marking to EN13967 Type A					
Characteristic	Test method	Units	Criteria	Result	
Tensile strength - MD	EN 12311	N/mm ²	MDV	32.8	
Tensile strength - CD	EN 12311	N/mm ²	MDV	33.1	
Tensile elongation - MD	EN 12311	%	MDV	699	
Tensile elongation - CD	EN 12311	%	MDV	723	
Joint strength	EN 12317-2	N	MDV	265	
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass	
Resistance to impact	EN 12691	mm	>MLV	200	
Durability watertightness after heat ageing	EN 1296	-	Pass/Fail	Pass	
Durability watertightness against chemicals	EN 1847	-	Pass/Fail	Pass	
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	245	
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	270	
BS 8485:2015 - Methane testing	Test method	Units	Criteria	Result	
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	1034	
Water vapour transmission - permeability	EN 1931	g/m ² /d	MDV	0.13	
Radon permeability	Sp Method 3873	m ² /s	MDV	<1.5 x 10 ⁻¹²	

Health and safety information

Refer to the Visqueen Ultimate HC Blok material safety datasheet (MSDS).

Visqueen Ultimate HC BLOK

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

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Structural
Waterproofing



Gas
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Damp Proof
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Tapes



Damp Proof
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Stormwater



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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.

Visqueen Gas Resistant Self Adhesive Membrane

Features and benefits

- BBA certified - third party accreditation
- Type A Barrier Membrane (Tanking Membrane) - resistant to ground water in accordance with BS 8102:2022
- 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
- Self adhesive application - no jointing tapes required

Product description

Visqueen Gas Resistant Self Adhesive Membrane is a foil lined modified bitumen rubber membrane with a self adhesive coating protected by a removable polyethylene release film. The product is silver on the upper surface and supplied in rolls 1m x 20m.

Approvals and standards

- Third party accreditation (BBA 15/5208)
- Suitable for use as a Type A Barrier Membrane (Tanking Membrane) to BS 8102:2022
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Conforms to the specification requirements of BR 211: 2015
- CE Mark EN 13969:2004
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Resistant Self Adhesive Membrane is a cold applied product, suitable for use as a Type A Barrier Membrane (Tanking Membrane) for above and below ground applications e.g. basements, retaining walls and lift pits.

It is also 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.

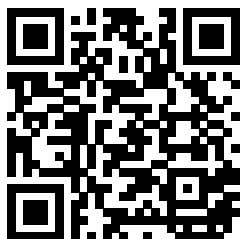
The membrane can be applied to a variety of substrates including concrete, flush pointed blockwork, flush pointed brickwork, particle boards and steelwork, in both vertical and horizontal applications.

The membrane can be used to achieve one form of waterproofing to Grades 1, 2 and 3 as defined in BS 8102:2022.

System components

- Visqueen HP Tanking Primer, 5L
- Visqueen Ultimate Top Hat Units
- Visqueen TreadGUARD 1500, 1m x 2m
- Visqueen Protect&Drain
- Visqueen Pile Cap Sealer, 25kg
- Visqueen IGW5 and IGW10 Waterstops

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NEW VISQUEEN CLASS B FR VAPOUR CHECK

- Visqueen Class B FR Vapour Check is a fire resistant AVCL (air and vapour control layer)
- Surpasses all national Building Regulations and Standards for air and vapour control layers
- Fire classification B - s1, d0
- Competitive, efficient and fully tested system (including tapes) for fire resistance

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Visqueen Gas Resistant Self Adhesive Membrane

Storage and handling

Visqueen Gas Resistant Self Adhesive Membrane should be stored vertically under cover in its original packaging.

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

Preparation

All surfaces to which Visqueen Gas Resistant Self Adhesive Membrane are to be applied should be free from cavities or projections, have a smooth finish, be dry and free from dust, loose particles and frost. Masonry, concrete or metal surfaces should be primed using Visqueen HP Tanking Primer and allowed to dry thoroughly.

When applying to blockwork or brickwork the joints must be flush pointed or the masonry rendered prior to applying the membrane.

The membrane can be cut with a sharp retractable safety knife.

Installation

Visqueen Gas Resistant Self Adhesive Membrane lap joints should be a minimum of 150mm and should be pressed and rolled to form a continuous bond and to ensure watertightness.

At 90 degree changes of direction a Visqueen Axiom UniSeal fillet should be formed prior to membrane installation.

For vertical applications cut the membrane to a suitable length allowing an additional 150mm for laps. Position and peel back release film and apply the self adhesive face to the substrate. Apply pressure to ensure a full bond is achieved. Commence at the top of the wall and work downwards, progressively removing the release film.

For horizontal applications unroll the membrane where required allowing an additional 150mm for laps. Re-roll one half of the membrane and cut release film taking care not to damage the membrane. Roll out the membrane progressively removing the release film. Press the membrane onto the substrate e.g. using a soft broom to ensure full adhesion. Repeat for the other half of the roll.

Watertight seals should be formed around all service entry points. Visqueen Preformed Top Hat Units should be used for sealing service entry pipes.

If the membrane is punctured or perforated, a patch of the same material should be lapped and bonded at least 150mm beyond the extents of the puncture.

The membrane should always be fully protected immediately after it is installed. When used externally on a retaining wall, the membrane should be protected from backfill with Visqueen Protect&Drain, which also provides a preferential pathway for ground gases.

When forming day joints, the upper edge of the membrane should be adequately secured e.g. bonding onto the top of the retaining wall, or if terminated on a vertical face, the upper edge should be secured with Visqueen Fixing Strip and Visqueen Fixings Pins for Masonry.

Usable temperature range

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

The membrane requires no additional bonding methods however during cold weather conditions the application of hot air to the self adhesive coating will aid adhesion.

Additional information

Where hazardous ground gases are not present use Visqueen Self Adhesive Membrane

Where concrete construction joints occur Visqueen IGW Waterstop system should be incorporated

Where wall ties penetrate the membrane, seal with Visqueen Axiom UniSeal

When waterproof concrete is required, or for additional detailing information, contact Visqueen Technical Services +44 (0) 333 202 6800.

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Visqueen Gas Resistant Self Adhesive Membrane

Property	Test method	Units	Compliance criteria	Result
Length	EN 1848-2	m	-0%/+5%	20
Width	EN 1848-2	m	-5%/+5%	1
Thickness	EN 1849-2	mm	-5%/+10%	1.2
Mass	EN 1849-2	g/m ²	-10%/+10%	1100
Watertightness	EN 1928	kPa	MDV	60
Durability after artificial ageing	EN 1847	-	Pass/Fail	Pass
Durability against chemicals	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) MD	EN 12310-1	N	>	100
Resistance to tearing (nail shank) CD	EN 12310-1	N	>	100
Resistance to static loading	EN 12730	kg	MLV	20
Resistance to Impact method A and B	EN 12691	mm	>	A >500 B >1000
Reaction to fire	EN 13501-1		Class	E
Joint Resistance	EN 12317-1	N	>	30
Tensile properties - MD	EN 12311-2	N/mm ²	>	2
Tensile properties - CD	EN 12311-2	N/mm ²	>	2
Tensile elongation - MD	EN 12311-1	%	>	130
Tensile elongation - CD	EN 12311-2	%	>	130
Reaction to fire	EN 13501-1	Class	MDV	F
Methane permeability	ISO 15105-1	ml/m ² /d	MDV	<1
Radon transmission rate	SP RI.SE	m/s	MDV	4.7 x 10 ⁻⁹
Radon permeability	SP RI.SE	m ² /s	MDV	0.56 x 10 ⁻¹²
Mean water vapour resistance factor	EN 1931	(μ)	MDV	3960000
Mean water vapour diffusion equivalent air layer thickness	EN 1931	(Sd) in m	MDV	4752
Mean water vapour resistance	EN 1931	MNs/g	MDV	23760
Mean water vapour permeability	EN 1931	g/m ² /day	MDV	0.03

Health and safety information

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Visqueen Gas Resistant Self Adhesive Membrane

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Visqueen Ultimate GeoSeal

Features and benefits

- Agreement certified - third party accreditation
- Complies with CIRIA C748:2014 - industry standard for volatile organic compounds (VOC) protection
- Complies with BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Type A Barrier Membrane (Tanking Membrane) - resistant to ground water in accordance with BS 8102:2022
- High resistance to puncture - greatly reduces risk of barrier becoming damaged during the build process
- 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 Ultimate Geoseal is a 1mm thick, robust pre-applied waterproofing barrier. It is coloured grey on the upper surface and black on the reverse. The grey surface is textured to aid adhesion to cast concrete.

The barrier is supplied in single wound rolls (not folded), 2.44m x 41m.

Approvals and standards

- Third party accreditation (BDA BAF-18-056-P-A-UK)
- Suitable for use as a Type A Barrier Membrane (Tanking Membrane) to BS 8102:2022
- Complies with CIRIA C748:2014
- 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 BR 211:2015
- CE Mark EN 13967:2012
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 45001:2018
- Environmental Management System ISO 14001:2015

Usage

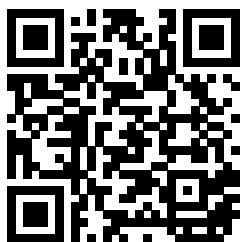
Visqueen Ultimate GeoSeal is a pre-applied fully bonded Type A Barrier Membrane (Tanking Membrane) for use with below ground reinforced concrete structures e.g. basements, retaining walls, lift pits and car parks. The barrier also prevents the ingress of harmful levels of volatile organic compounds (VOCs) and hazardous ground gases.

The pre-applied barrier can be used to achieve waterproofing to Grades 1, 2 and 3 as defined in BS 8102:2022.

System components

- Visqueen Ultimate Double Sided Jointing Tape, 100mm x 15m
- Visqueen GR Lap Tape, 150mm x 10m
- Visqueen Ultimate Retaining Discs, 50mm long x 35mm head diameter x 500 per box
- Visqueen Ultimate Top Hat Units
- Visqueen Preformed Units
- VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m
- Visqueen Pile Cap Sealer, 25kg
- Visqueen IGW5 and IGW10 Waterstops

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- Visqueen Class B FR Vapour Check is a fire resistant AVCL (air and vapour control layer)
- Surpasses all national Building Regulations and Standards for air and vapour control layers
- Fire classification B - s1, d0
- Competitive, efficient and fully tested system (including tapes) for fire resistance



To discover the Visqueen difference visit www.visqueen.com or call us on +44 (0) 333 202 6800



Visqueen Ultimate GeoSeal

Storage and handling

Visqueen Ultimate GeoSeal 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 Ultimate GeoSeal should be installed on a smooth continuous surface e.g. compacted blinding layer, smooth concrete blinding or well consolidated MOT Type 1. The substrate should be free from irregularities such as voids or protrusions.

Where protection against hydrostatic water pressure is required, the barrier should be applied with welded joints.

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

Installation

Visqueen Ultimate GeoSeal should be loose laid on horizontal substrates and pre-applied to vertical substrate with the grey textured side facing towards the wet cast concrete so that a key to the concrete can be achieved.

The barrier has been designed to exhibit superior welding properties using hot wedge, hot air or extrusion welding, therefore onsite welding of all lap joints is recommended for all applications, and should be employed when hydrostatic water pressure or hydrocarbon/VOC contamination is present.

Alternatively, when the barrier is used for damp proofing, ground gas protection and sites where hydrostatic water pressure or hydrocarbon/VOC contamination is of low risk, lap joints can be bonded with Visqueen Ultimate Double Sided Jointing Tape and sealed with Visqueen GR Lap Tape. When using tapes to secure laps, the overlap should be minimum 150mm and the membrane surfaces to be jointed should be dry and free from contamination such as dust or sand. Once the tapes are applied, the lap should be well rolled with a seam roller to ensure full adhesion and continuity.

The barrier should not be taken through any masonry wall. The relevant Visqueen damp proof or gas proof course should be taken through and extended beyond the wall by a minimum of 250mm where it can be jointed to the barrier with the above tapes.

When installed vertically, the barrier should be pre-applied to temporary formwork or the adjoining structure. Visqueen Retaining Discs are available to provide a means for securing the leading edge of the membrane to the temporary formwork. The barrier should be installed with the smooth black surface facing the formwork. Visqueen Retaining Discs should be mechanically fixed at maximum 400mm centres to the internal face of the shuttering using oval nails. A suitable power tool and 6mm drill bit to create a pilot hole in the barrier, it should be secured over the protruding section of the retaining disc. The top edge of the barrier should be trimmed to approximately 10mm below the top edge of the slab. Once the concrete has set, the oval nails should be removed by pulling through from the external face of the shuttering. When the temporary formwork is removed the Visqueen Retaining Discs should be visible on the external (smooth black) face of the barrier. Continuity of the barrier system with the damp or gas proof course is maintained using Visqueen Gas Resistant Self Adhesive Membrane.

Visqueen Ultimate 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 Ultimate Double Sided Jointing Tape and sealed with Visqueen GR 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 that welded membrane or Visqueen Ultimate 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, depending on the specified jointing method, either welded in position or bonded with Visqueen Ultimate Double Sided Jointing Tape and sealed with Visqueen GR Lap Tape. Alternatively a patch can be formed using Visqueen Pro Detailing Strip and lapped at least 150mm beyond the perimeter of the puncture.

Due to the robust nature of the product, the barrier can withstand normal on-site foot traffic and the activities associated with the laying of a reinforced concrete slab without the need for additional protection. However, care should still be taken to ensure that the barrier is not punctured, stretched or displaced when applying the reinforced concrete.

In high temperature conditions the barrier should be covered immediately after installation.

Usable temperature range

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



Visqueen Ultimate GeoSeal

Additional information

Where required, Visqueen's network of preferred installers can install the barrier and offer the client a fully warranted system
When using Visqueen Ultimate GeoSeal in an external waterproofing application hydrostatic pressure can be relieved by using Visqueen Protect&Drain

To assist build sequencing, Visqueen Ultimate Gas DPC is available for gas protection through the wall constructions

When used in accordance with CIRIA C748:2014 or BS8485:2015 + A1:2019, a subfloor ventilation system or pressure relief maybe required

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.

Visqueen Ultimate GeoSeal

Property	Test method	Units	Criteria	Result
Colour				Grey/black
Weight		kg		97
Length	EN 1848-2	m	-0/+10%	41
Width	EN 1848-2	m	-0/+10%	2.44
BS 8485:2015 + A1:2019 and C748:2014 data				
Puncture	EN 12236	N	MDV	2850
Impact resistance Method A hard surface	EN 12691	mm	MDV	750
Impact resistance Method B soft surface	EN 12691	mm	MDV	>2000
Tensile strength MD (1) equipment unable to break the barrier	ASTM D4885-01	kN/m	MDV	11.9
Tensile strength CD (1) equipment unable to break the barrier	ASTM D4885-01	kN/m	MDV	12.7
Elongation MD (1) equipment unable to break the barrier	ASTM D4885-01	%	MDV	>500
Elongation CD (1) equipment unable to break the barrier	ASTM D4885-01	%	MDV	>501
Tear resistance - trouser method A - MD	BS ISO 34-1	kN/m	MDV	79.6
Tear resistance - trouser method A - CD	BS ISO 34-1	kN/m	MDV	75.8
Tear resistance - angle method B - MD	BS ISO 34-1	N	MDV	128.3
Tear resistance - angle method B - CD	BS ISO 34-1	N	MDV	126.9
C748:2014 - Permeation vapour tests @ 100% conc.				
Benzene	ISO 15105-2	ml/m ² /d	MDV	<1
Toluene	ISO 15105-2	ml/m ² /d	MDV	<1
Ethyl benzene	ISO 15105-2	ml/m ² /d	MDV	<1
m,p xylene	ISO 15105-2	ml/m ² /d	MDV	<1
Hexane	ISO 15105-2	ml/m ² /d	MDV	<1
Vinyl chloride	ISO 15105-2	ml/m ² /d	MDV	<1
Tetrachloroethene (PCE)	ISO 15105-2	ml/m ² /d	MDV	<1
Trichloroethene (TCE)	ISO 15105-2	ml/m ² /d	MDV	<1
Naphthalene	ISO 15105-2	ml/m ² /d	MDV	<1
C748:2014 - Chemical immersion testing (2) (2) Pass achieved if barrier under test is within 25% of untested barrier		Weight % (2)	Thickness % (2)	Tensiles/elongation (2)
Benzene	EN 14414	Pass	Pass	Pass
Toluene	EN 14414	Pass	Pass	Pass
Ethyl benzene	EN 14414	Pass	Pass	Pass
(m,p, and o) xylenes	EN 14414	Pass	Pass	Pass
Hexane	EN 14414	Pass	Pass	Pass
Vinyl chloride	EN 14414	Pass	Pass	Pass
Tetrachloroethene (PCE)	EN 14414	Pass	Pass	Pass
Trichloroethene (TCE)	EN 14414	Pass	Pass	Pass
Naphthalene	EN 14414	Pass	Pass	Pass
CE Marking to EN 13967:2017				
Characteristic	Test method	Units	Criteria	Result

Visqueen Ultimate GeoSeal

Property	Test method	Units	Criteria	Result
Tensile Strength - MD	EN 12311	N/mm ²	MDV	23.6
Tensile Strength - CD	EN 12311	N/mm ²	MDV	22.4
Tensile Elongation - MD	EN 12311	%	MDV	701
Tensile Elongation - CD	EN 12311	%	MDV	706
Joint Strength	EN 12317-2	N	MDV	598
Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass
Resistance to impact	EN 12691	mm	MDV	700
Durability watertightness after heat ageing	EN 1296	60kPa	Pass/Fail	Pass
Durability watertightness against chemicals	EN 1847	-	Pass/Fail	Pass
Resistance to tearing (nail shank) CD	EN 12310-1	N	MDV	720
Resistance to tearing (nail shank) MD	EN 12310-1	N	MDV	750
Resistance to static loading	EN 12730	kg	>MLV	20
Water vapour transmission - resistance	EN 1931	MNs/g	MDV	2142
Water vapour transmission - permeability	EN 1931	g/m ² /d	MDV	0.063
Watertightness welded and taped joint	EN1928	60kPa	Pass/Fail	Pass
Methane permeability unjointed	ISO 15105-1	ml/m ² /d/atm	<40	3.2
Methane permeability jointed	ISO 15105-1	ml/m ² /d/atm	<40	34.7
Carbon dioxide unjointed	ISO 15105-1	ml/m ² /d/atm	<40	7
Radon permeability	SP RI.SE	m ² /s		3.0 x 10 ⁻¹²

Health and safety information

Refer to the Visqueen Ultimate GeoSeal material safety datasheet (MSDS).

Visqueen Ultimate GeoSeal

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Complete Range, Complete Solution



Structural
Waterproofing



Gas
Protection



Damp Proof
Membrane



Tapes



Damp Proof
Course



Stormwater



Vapour
Control

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Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m

Features and benefits

- BBA certified jointing system - third party accreditation
- Complies with BS 8485:2015 + A1:2019 - industry standard for methane and carbon dioxide protection
- Good adhesion properties - provides an overlap seal to Visqueen gas protection membranes
- Joint integrity - stops poured concrete entering the lap joint
- Health and Safety - seals the exposed lap from risk of installer accidents

Product description

Visqueen Gas Resistant (GR) Foil Lap Tape is an overlap tape which has a solvent acrylic adhesive with a composite aluminium/PET carrier therefore it is resistant to alkaline which is present in cement and concrete. The tape also has a release film.

The product is supplied in roll format 75mm x 50m.

To be used in conjunction with Visqueen Pro Double Sided Jointing Tape 50mm x 10m.

Approvals and standards

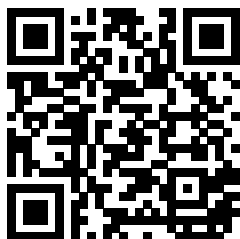
- Third party accreditation (BBA 13/5069)
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

Visqueen Gas Resistant Foil Lap Tape is used to bond lap joints on gas protection membranes. It can be used internally and externally and is suitable in compressed load applications.

System components

Find your local stockist



Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m

Storage and handling

Store in warm, dry and clean environment in its current packaging. The tape should not be exposed to long periods of ultraviolet light. In very cold weather, prior to use ensure that the material is stored in warm conditions above 5°C.

Preparation

Ensure all surfaces are clean and dry. The membrane joint surfaces should be dry and free from contamination such as dust or sand. Ensure the surface and working area is not water logged. Avoid areas of unsupported jointing.

Installation

The membrane should be overlapped by at least 150mm, bonded with Visqueen Pro Double Sided Jointing Tape and sealed with Visqueen Gas Resistant Foil Lap Tape.

When using the GR Foil Lap tape, apply the tape equidistant over the lap area of the laid sheet and the overlap adjoining membrane. Apply pressure to the jointed area to ensure adhesion. Once the tape is applied, the completed lap should be well rolled with firm pressure to ensure a complete seal joint has occurred, and continuity with the adjacent sheet has been achieved.

Usable temperature range

It is recommended that the system components should be used above 5°C.

Additional information

In demanding site conditions seal lap joints with Visqueen Ultimate GR Lap Tape.

Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m

Property	Result
Dimensions	75mm x 50m
Peel adhesion	750N/m
Adhesive type	Solvent acrylic

Health and safety information

Please refer to material safety datasheet.

Visqueen Gas Resistant Foil Lap Tape, 75mm x 50m

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Waterproofing



Gas
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VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m

Features and benefits

- Utilises Visqueen's Advanced Adhesion Technology - twice the adhesion in cold weather
- Complete system - use with Visqueen HP Tanking Primer to obtain best performance
- Flexible - can be cut and shaped to various applications
- Multi-use - ideal for complex junctions, stanchions, patchwork and terminations
- Aluminium core - gas resistant in accordance with BS8485:2015+A1:2019

Product description

VisqueenPro Detailing Strip is a composite of PET/aluminium and a high performance cold weather butyl compound. It is available in roll format, 300mm x 10m and 500mm x 10m.

Approvals and standards

- Third party accreditation - BBA certification
- 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
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

Usage

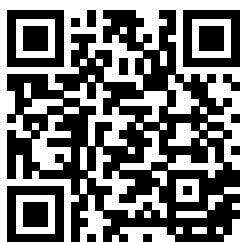
Visqueen ProDetailing Strip can be used for gas protection systems, waterproofing system, and damp proofing systems for use on concrete, blockwork, brickwork, particle boards, steel work, steel stanchions and wooden structures for both vertical and horizontal application.

VisqueenPro Detailing Strip is post applied against the structure, steel stanchions and forms complex detailing. It forms a 2-part system with the Visqueen HP Tanking Primer. The Visqueen HP Tanking Primer is a single component primer, for use see separate datasheet.

System components

- Visqueen HP Tanking Primer, 5L

Find your local stockist



VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m

Storage and handling

Store in warm (above 5°C), dry and clean environment in its current packaging. The product must be stored upright.

Preparation

Surfaces must be smooth and free from sharp protrusions, ensure the surface and working area is not water logged and is frost free. When applying to blockwork or brickwork the joints must be flush pointed, in demanding applications the masonry face must be rendered prior to applying the Visqueen Pro Detailing Strip. Prior to applications the surface should be sealed using Visqueen HP Tanking Primer and allowed to dry thoroughly. The Visqueen HP Tanking Primer must not be used on Insulation or ICF systems, please contact Visqueen Technical Department.

Installation

All lap joints should be a minimum of 150mm and must be pressed and rolled to form a continuous bond to ensure gas and water tightness.

For complex detailing the detailing strip can easily be cut, shaped and formed around the area.

For patch work - when membranes are punctured, VisqueenPro Detailing Strip can be lapped at least 150mm beyond the extents of the puncture.

Usable temperature range

It is recommended that Visqueen membranes and system components should be used above 5°C

Additional information

When applying to blockwork or brickwork the joints must be flush pointed, in demanding applications the masonry face must be rendered prior to applying the Visqueen Pro detailing Strip. The Visqueen HP Tanking Primer must not be used on Insulation or ICF systems, please contact Visqueen Technical Department.

VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m

Property	Value
Width	300mm and 500mm
Length	10m
Application temperature range	-5°C to 40°C
Peel Adhesion EN12316, Steel ASTM D1000, in N/cm @ 5°C	
Polyethylene	20.7
Polyethylene with no static charge	21.2
Steel	26.9
Concrete	28.8
Mean water vapour resistance factor , EN1931, u	3960000
Mean water vapour diffusion equivalent air layer thickness EN1931, (Sd) in m	4752
Mean water vapour resistance, EN1931, MNs/g	23760
Mean water vapour permeability, EN1931, g/m2/day	0.03

Health and safety information

Please refer to material safety datasheet

VisqueenPro Detailing Strip, 300mm x 10m, 500mm x 10m

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VisqueenPro Double Sided Jointing Tape, 50mm x 10m

Features and benefits

- Third party certification - part of a dpm/ gas protection BBA approved jointing system
- Gas resistant - provides excellent resistance to harmful bulk gases ingress and moisture ingress
- Excellent adhesion - to gas and damp proof membranes

Product description

VisqueenPro Double Sided Jointing Tape is a double sided butyl based compound with an oversize quick release film. It is available in roll format 50mm x 10m.

To complete the joint use the Visqueen Gas Resistant Foil Tape for gas applications and use the Visqueen Pro Single Sided Tape for damp applications.

Approvals and standards

- Third party accreditation - BBA certification
- Conforms to the specification requirements of BS 8485:2015 + A1:2019
- Quality Management System ISO 9001:2015
- Occupational Health and Safety System ISO 18001:2007
- Environmental Management System ISO 14001:2015

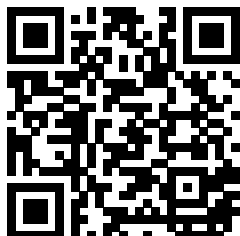
Usage

VisqueenPro Double Sided Jointing Tape is used to bond membranes (gas or damp) together along the appropriate sheet lap ends. It can also be used for patch work where the membrane is punctured, creating airtight seals around pipe penetrations and bonding the floor membrane to the damp proof course at the horizontal plane.

To complete the joint use the Visqueen Gas Resistant Foil Tape for gas applications or use the Visqueen Pro Single Sided Tape for damp proof membranes.

System components

Find your local stockist



VisqueenPro Double Sided Jointing Tape, 50mm x 10m

Storage and handling

Store in warm, dry and clean environment in its current packaging. The tape should not be exposed to long periods of ultraviolet light. In very cold weather, prior to use ensure that the material is stored in warm conditions above 5°C.

Preparation

Ensure all surfaces are clean and dry. The membrane joint surfaces should be dry and free from contamination such as dust or sand. Ensure the surface and working area is not water logged. Avoid areas of unsupported jointing.

Installation

Apply VisqueenPro Double Sided Jointing Tape to the lap area of the laid sheet starting approximately 50mm from the membrane edge. Apply pressure to the tape to ensure the tape has adhered to the membrane. Remove quick release paper from the tape and overlap the adjoining membrane by minimum 150mm. For Visqueen damp proof membranes and gas protection membranes lap joints should then be sealed using the appropriate Visqueen lap tape. Once the tape is applied, the completed lap should be well rolled with firm pressure to ensure a complete seal joint has occurred, and continuity with the adjacent sheet has been achieved.

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 VisqueenPro Double Sided Jointing Tape and sealed with the appropriate lap tape.

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.

Usable temperature range

It is recommended that VisqueenPro Double Sided Jointing Tape and other system components should be used above 5°C.

Additional information

VisqueenPro Double Sided Jointing Tape, 50mm x 10m

Property	Result
Width	50mm
Length	10m
Colour	Blue
Adhesive type	Butyl
Dynamic Shear Adhesion	14 N/cm ²
Dynamic Tensile Adhesion	18 N/cm ²
180° Peel Adhesion	11 N/cm ²
Moisture Vapour Transmission Rate	0.24 g/m ² /d
Service Temperature Range	-40 to 90°C
Application temperature	>5°C

Health and safety information

Please refer to material safety datasheet.

VisqueenPro Double Sided Jointing Tape, 50mm x 10m

About Visqueen

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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.

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.

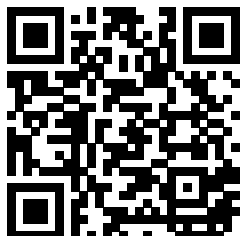
The barrier can also be used as a high performance radon membrane and/or damp proof membrane.

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





- Visqueen Class B FR Vapour Check is a fire resistant AVCL (air and vapour control layer)
- Surpasses all national Building Regulations and Standards for air and vapour control layers
- Fire classification B - s1, d0
- Competitive, efficient and fully tested system (including tapes) for fire resistance



ANOTHER FIRE PROTECTION PRODUCT FROM VISQUEEN

To discover the Visqueen difference visit www.visqueen.com or call us on +44 (0) 333 202 6800



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.

Visqueen Gas Barrier

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).

Visqueen Gas Barrier

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APPENDIX C

BSL Verification Staff Competence Records

Experience and Qualifications of Verifiers of Ground Gas Protection Systems

Brownfield Solutions Ltd hold ISO9001 and 14001 accreditations for our IMS. We are registered members of the CHAS Health and Safety accreditation scheme, members of the Association of Geotechnical and Geo-Environmental Specialists (AGS) and are registered and validated by Achilles.

Aaron Stokoe

Qualifications:

BSc (Hons) (Geology) CSci MEnvSc FGS
Chartered Scientist (2018)

Professional Bodies:

Member of the Institute of Environmental Science (IES)
Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)
GGG Two Day A-Z of Ground Gas Protection June 2016
CL:AIRE Webinar "An Introduction to the Verification of Ground Gas Protection Measures"
Visqueen CPD Seminar 1: Gas Protection - Protecting against gas on contaminated land 28 March 2019
LQM Technical Briefing Webinar (Ground Gases) "Correct Application of BS8485 to Characterise Gas Risk" 3 May 2019
Proctor Group Webinar "Protection of Buildings on Brownfield Sites" 18 February 2020
Environmental Analyst Webinar "Mine Gas Risk Assessment: Best Practice" 2 April 2020
Property Care Association (PCA) Webinar "Verification of Ground Gas Protection Systems" 23 July 2020.
Property Care Association (PCA) Webinar "Controlling Ground Gases & Water – How to get Synergy" watched 12 January 2021
SoBRA – Ground Gas September 2021
SoBRA – Vapour Risk October 2021
Atlas Copco Compressors "Introduction to Compressed Air" 8 January 2021 (compressor for air lance)
British Compressed Air Society "Working Safely with Compressed Air" January 2021 (compressor for air lance)

Chartered Scientist with over 13 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Dan Gates

Qualifications:

MGeoscience (Geology) FGS

Professional Bodies:

Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)
GGG Two Day A-Z of Ground Gas Protection 18 October 2017
Visqueen CPD Seminar 1: Gas Protection - Protecting against gas on contaminated land 28 March 2019
Atlas Copco Compressors "Introduction to Compressed Air" 8 January 2021 (compressor for air lance)
British Compressed Air Society "Working Safely with Compressed Air" January 2021 (compressor for air lance).

Senior project engineer with circa 11 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Jack Mather

Qualifications:

BSc (Hons) FGS (Geology)

Professional Bodies:

Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Visqueen CPD Seminar 1: Gas Protection - Protecting against gas on contaminated land 28 March 2019

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 29 January 2020 (Full day Course)

Proctor Group CPD Webinar: Ground Gas Protection 16 October 2020

CL:AIRE CPD Webinar: Verification of Gas Protection Systems 16 October 2020

Property Care Association CPD Webinar: Verification of Ground Gas Protection Systems 16 October 2020

Project engineer with over 5 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Tim Mayall

Qualifications:

MGeol (Hons) (Geology) FGS

Professional Bodies:

Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Visqueen CPD Seminar 1: Gas Protection - Protecting against gas on contaminated land 28 March 2019

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 29 January 2020 (Full day)

Environmental Analyst Webinar "Mine Gas Risk Assessment: Best Practice" 2 April 2020

Atlas Copco Compressors "Introduction to Compressed Air" 8 January 2021 (compressor for air lance)

British Compressed Air Society "Working Safely with Compressed Air" January 2021 (compressor for air lance)

Project engineer with over 5 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Nicola Swallow

Qualifications:

BSc (Hons) (Environmental Science) MSc MEnvSc

Professional Bodies:

Member of the Institute of Environmental Science (IES)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Visqueen CPD Seminar 1: Gas Protection - Protecting against gas on contaminated land 28 March 2019

Senior Project engineer with over 10 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Tim Wilson

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 25 January 2022 (Full day Course)

Senior Geo-Environmental Technician with over 20 years' experience in the construction industry trade.

Will Griffiths

Qualifications:

BSc (Hons) CEnv MEnvSc

Professional Bodies:

Member of the Institute of Environmental Science (IES)

Relevant CPD Training and Experience Summary:

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 22 June 2022 (Half day Course).

Neil Salvidge TD&A Ltd – Air Lance Integrity Testing including set up and demonstration

Associate Director with 15 years experience in ground investigation, characterisation of ground gas regimes, risk assessment, recommendations for ground gas protection systems and verification of installed systems.

Jake Wheaton

Qualifications:

BSc (Hons) FGS (Geology)

Professional Bodies:

Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 22 June 2022 (Half day Course)

Senior project engineer with circa 7 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Amy Thornes

Qualifications:

BSc (Hons)(Geology) MSc (Geotechnical Engineering) FGS

Professional Bodies:

Fellow of the Geological Society (FGS)

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 22 June 2022 (Half day Course)

Project engineer with circa 4 years' experience in ground investigation, characterisation of ground gas regimes, recommendations for ground gas protection systems and verification of installed systems.

Henry Dunlop

Relevant CPD Training and Experience Summary:

Valid and in date CSCS Card held (scan available on request)

Neil Salvidge TD&A Ltd "Ground Gas Protection installation covering basic membrane installation methods of heat fusing, detailing, and implementation of Verification in accordance with CIRIA C735" 22 June 2022 (Half day Course)

Geo-Environmental Technician with circa 1 years' experience in the construction industry trade.

APPENDIX D

Inspection Pro-Forma

Verification of Ground Gas Protection Systems



Job No:

Client:

Site Name:

Plot/Area Number (s):

Weather:

Verifier/Inspector (s):

Drawing Refs:

Structure Type:

Floor Slab Type:

Gas protection Type:

Installer and competency (e.g. NVQ)

Passive Venting Measures	✓/✖	Inspection Date (s)	Photos:	
Void Former				
Void Height				
Gravel Type				
External Wall Air Bricks				
Internal Sleeper Wall Vents				
External Vent Trench/Duct				

Gas Barrier/Membrane	✓/✖	Inspection Date (s)	Photo	
Underside of membrane				
Membrane Type				
Extent of Coverage				
Slab/membrane condition				
Jointing tape product				
Laps, joints, welds and seals				
Damp-proof course				
Service entries and seals				
Cavity inspection				

This plot/area

REQUIRES FURTHER INSPECTION

Where the above inspection indicates a Pass, construction worksn for that plot/area may proceed, subject to suitable protection measures of the membrane being applied in accordance with the manufacturer’s recommendations.

Compiled by:

Insert Signature here

Print Name (overwrite here)

Checked By:

Insert Signature here

Print Name (overwrite here)

Gas Protection Measures Inspection Checklist

Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
External wall airbricks	Numbers, size, positions as design drawing?
Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
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 structure?
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.
Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
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 gas membrane?
Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap? Sections taped twice?
Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
Cavity Inspection	Confirm that the cavity is not blocked with debris, check that there are no rips in the membrane across the cavity and the jointing detail (if present) is fully sealed.

APPENDIX E

Warning Label

CAUTION

THE MEMBRANE YOU WILL ENCOUNTER ACROSS THIS SITE IS NOT JUST A DPM. THIS MEMBRANE IS A **GAS BARRIER!!**

IT HAS BEEN PURPOSEFULLY SELECTED TO PROTECT THE FUTURE OCCUPANTS OF THIS BUILDING.

PLEASE BE CAREFUL NOT TO **DAMAGE**.
ALTHOUGH IT CAN BE REPAIRED AND PATCHED, UNREPORTED
DAMAGE AND CUTS CAN RENDER THE MEMBRANE **USELESS**.

THE GROUND CONDITIONS BENEATH YOUR FEET ON THIS SITE HAVE THE POTENTIAL TO PRODUCE ASPHYXIAN OR EXPLOSIVE GASES. THESE PRESENT NO RISK IN YOUR DAILY TASKS BUT CAN ACCUMULATE IN A CLOSED BUILDING OVER TIME. THE GAS BARRIER IS VITAL FOR THE HEALTH AND WELLBEING OF THOSE WHO OCCUPY THIS BUILDING.



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