Castledine Environmental

LAND CONTAMINATION SURVEYS

Phase 4 Verification Report

for

Demolition of Existing Dwelling and Attached Garage and Erection of 2 No. Detached Dwellings with Internal Garages on the site of No.45 First Avenue, Worthing, West Sussex BN14 9NJ

No.45, First Avenue, Worthing Plot No. 2 only

Date: March 2022

Status:	Final Report
Reference:	3191D P4 KAL Homes - Worthing
Date:	09/03/2022

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4 Wymeswold Road, Hoton, Loughborough, Leicestershire, LE12 5SN

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1.0 QUALITY ASSURANCE

Castledine Environmental confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine Environmental would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine Environmental.

Kevin Castledine

(Proprietor)

2.0 INTRODUCTION

Castledine Environmental have been appointed by KAL Homes Ltd to carry out a verification inspection on works carried out at No.45 First Avenue, Worthing, West Sussex BN14 9NJ.

The following reports previous reports on the site are:

- Phase 1 Land Contamination Risk Assessment for No.45 First Avenue, Worthing. Produced by Castledine Environmental in March of 2021 and referenced: 3112D
- Phase 3 Remediation Strategy and Verification Plan for No.45 First Avenue, Worthing. Produced by Castledine Environmental in May of 2021 and referenced: 3146K

3.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of KAL Homes Ltd and their appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework 2021
- part C1 of the building regulations.
- Condition No.6 of the Planning Inspectorate Appeal Decision Notice planning approval reference APP/M3895/W/18/32207300 https://planning.adur-worthing.gov.uk/online-applications/simpleSearchResults.do?action=firstPage

6. No development shall take place, (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), until the following components of a scheme to deal with the risks associated with contamination of the site have been submitted to and approved in writing by the Local Planning Authority:-

(1) A preliminary risk assessment which has identified:-

• all previous uses;

• potential contaminants associated with those uses;

• a conceptual model of the site indicating sources, pathways and receptors; and

• potentially unacceptable risks arising from contamination at the site.

(2) A site investigation scheme, based on (1) above to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

(3) The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full

details of the remediation measures required and how they are to be undertaken.

(4) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in (3) are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Any changes to these components require the express consent of the Local Planning Authority. The scheme shall be implemented as approved above and, prior to commencement of any construction work (or such other date or stage in development as may be agreed in writing with the Local Planning Authority), a Verification Report demonstrating completion of the works set out in the approved remediation strategy and the effectiveness of the remediation shall be submitted to and approved in writing by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a 'long-term monitoring and maintenance plan') for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the Local Planning Authority.

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine Environmental.

- The report consists of a Remediation Strategy and Verification Plan in accordance BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- CIRIA: C735 good practice on the testing and verifications of protection systems for buildings hazardous ground
- LCRM “Land Contamination Risk Management”.

4.0 OVERVIEW OF FINDINGS AND RECOMMENDATIONS FROM PREVIOUS REPORTS

4.1 SUMMARY OF GROUND GAS REGIME

A previous investigation has found that the site is located in an area of former chalk and gravel pits with a nearby landfill record. The landfill waste type is unrecorded and as such, these features, coupled with the nature of the local geology in the area (chalky, dissolution features, well-fractured) mean there is a credible risk to site, should they be producing hazardous ground gases

4.2 SUMMARY OF WORKS CARRIED OUT

The client has installed ground gas protection measures (inline with BS 8485:2015+A1:2019 ‘Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings’) within the proposed development. This consisted of beam and block flooring with subfloor void of minimum 150mm with exterior venting (airbricks located on opposite sides of the dwelling) and a Visqueen gas barrier membrane.

An example of the recommended gas protection plan can be found in Appendix C.

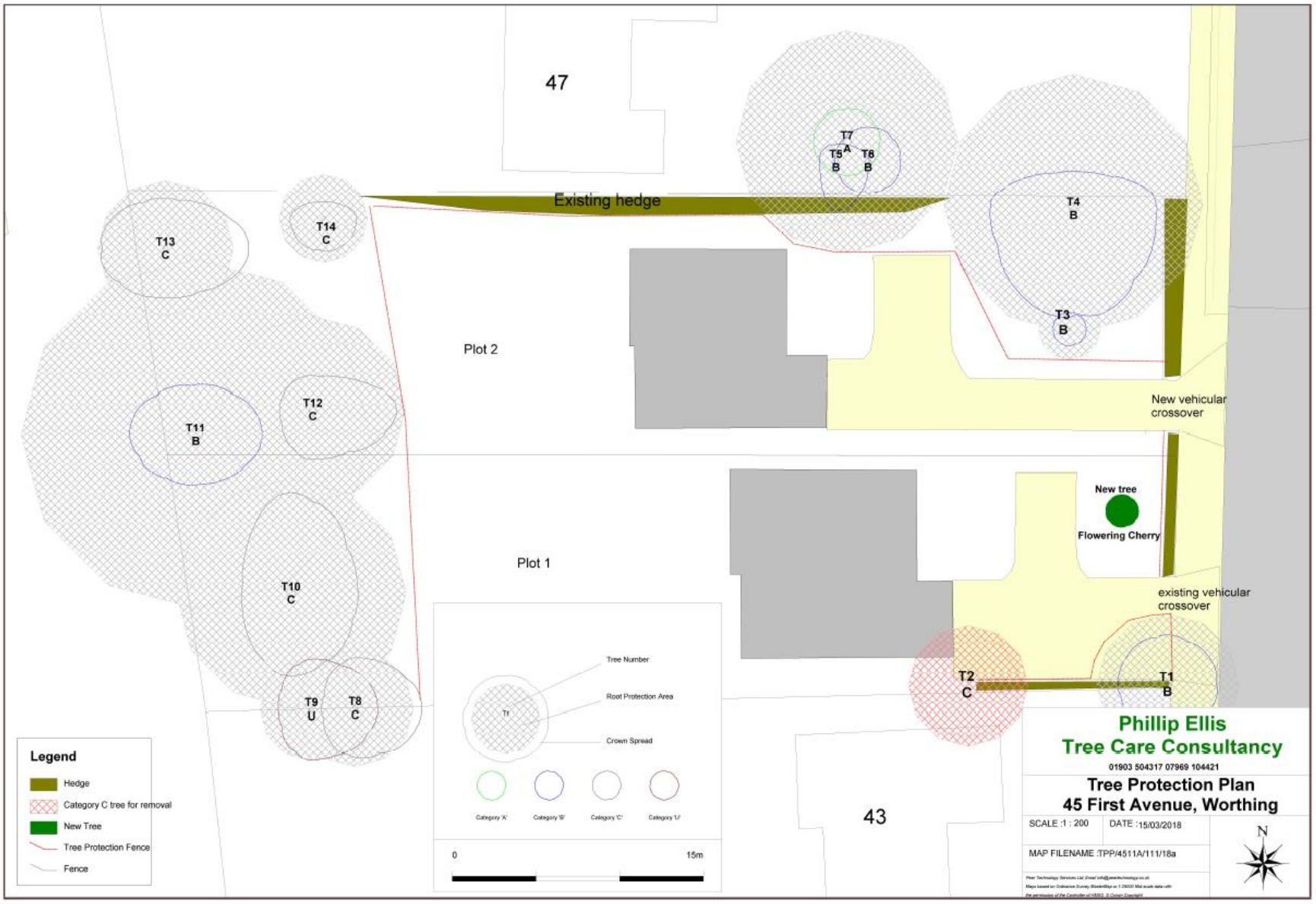
4.3 VERIFICATION PRO-FORMA (TAKEN FROM CIRIA C735)

Site Name:- No.45, First Avenue, Worthing. (Plot No.2)	**Gas Characteristic situation:-** CS2
Job No:- 3191K	**Type of building:-** Type A – Residential
Date:- 04/03/2022	**Building Description:-** Dwelling
Visit by:- K. Castledine	**Foundation type (floor):-** Beam & Block
Weather:- Fine	**Gas protection type:-** Passive ventilation with membrane

No	Item	Comments
1	**Gas Membrane**	
1.1	Condition of sub-grade and underside of gas membrane	Good
1.2	Gas membrane type	Visqueen gas barrier
1.3	Gas membrane condition	Good
1.4	Joining tape product	Visqueen
1.5	Lapping design	150mm overlap
1.6	Laps, welds and joints seals	Double sided tape
.7	Service entries seals	Top hats
2	**Passive venting**	
2.1	Sub-floor void	Min.150mm void present
2.2	External wall airbricks	Yes on either side of dwelling at every 2m, connected to telescopic air vents
2.4	External vent trenches/ducts	Na
	Active venting	
	System details	Na
	Additional Notes:	Tested and correctly fitted. No repairs required.

5.0 APPENDICES

APPENDIX A **PROPOSED SITE PLANS**



APPENDIX B MEMBRANE INSPECTION PHOTOGRAPHS

Castledine Environmental
LAND CONTAMINATION SURVEYS

Client: KAL Homes Ltd

Address: First Avenue, Worthing

Membrane Inspection Photos



Photo No.1: Showing construction at slab level



Photo No.2: Corner detailing at slab level

Castledine Environmental
LAND CONTAMINATION SURVEYS

Client: KAL Homes Ltd

Address: First Avenue, Worthing

Membrane Inspection Photos



Photo No.3: Stanchion detailing at slab level



Photo No.4: Service entry detailing at slab level

Castledine Environmental
LAND CONTAMINATION SURVEYS

Client: KAL Homes Ltd

Address: First Avenue, Worthing

Membrane Inspection Photos

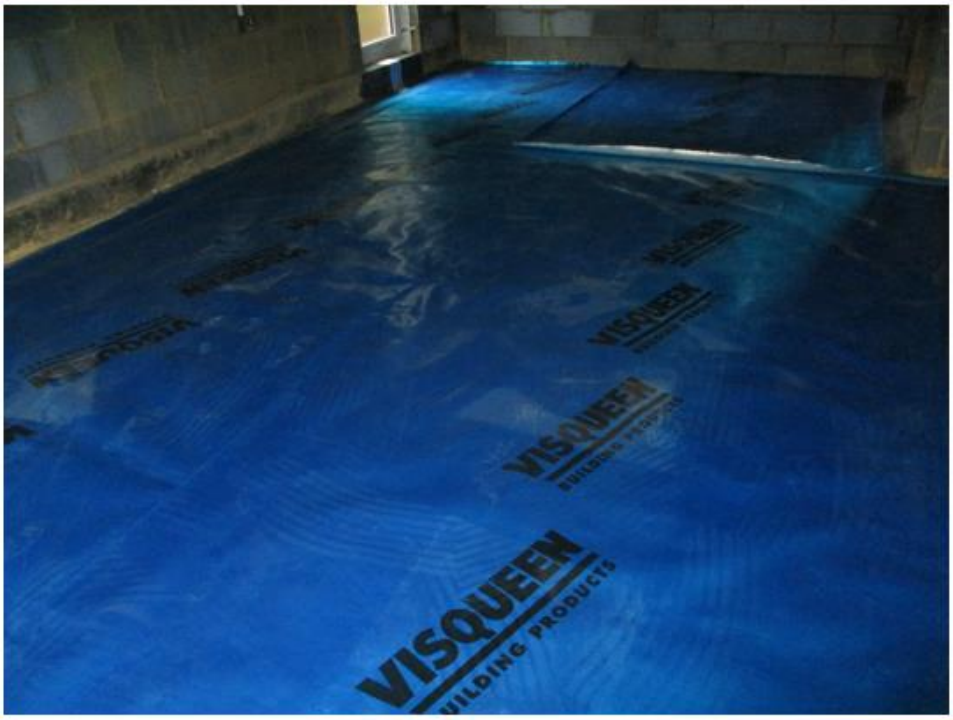


Photo No.5: Membrane installed throughout dwelling

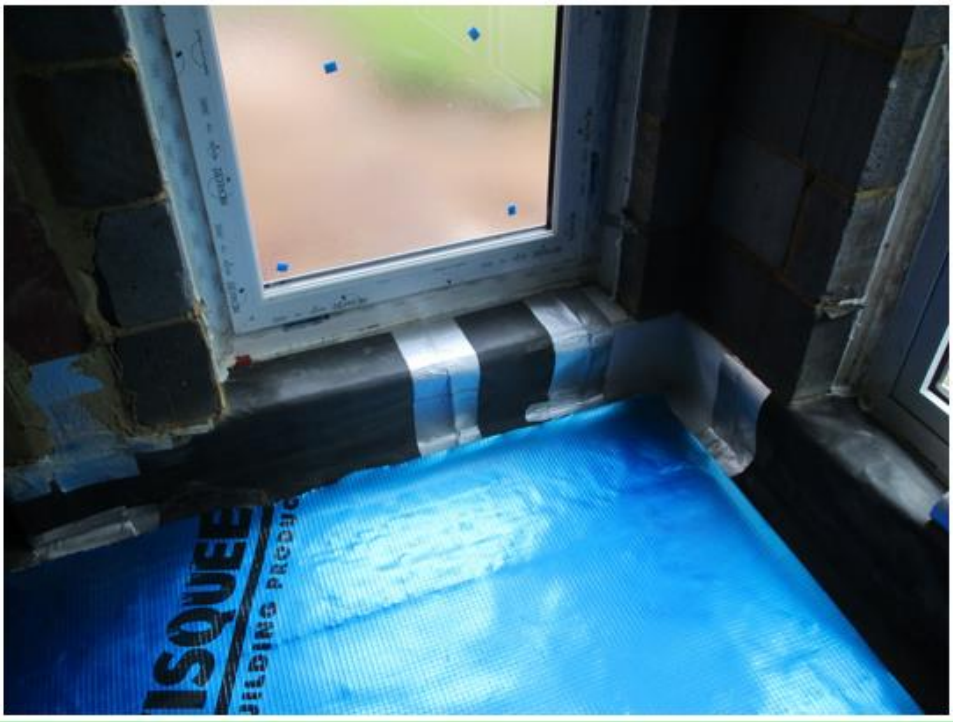


Photo No.6: Doorway detailing (perimeter and fill)

Castledine Environmental
LAND CONTAMINATION SURVEYS

Client: KAL Homes Ltd

Address: First Avenue, Worthing

Membrane Inspection Photos



Photo No.7: Finished service entry detailing

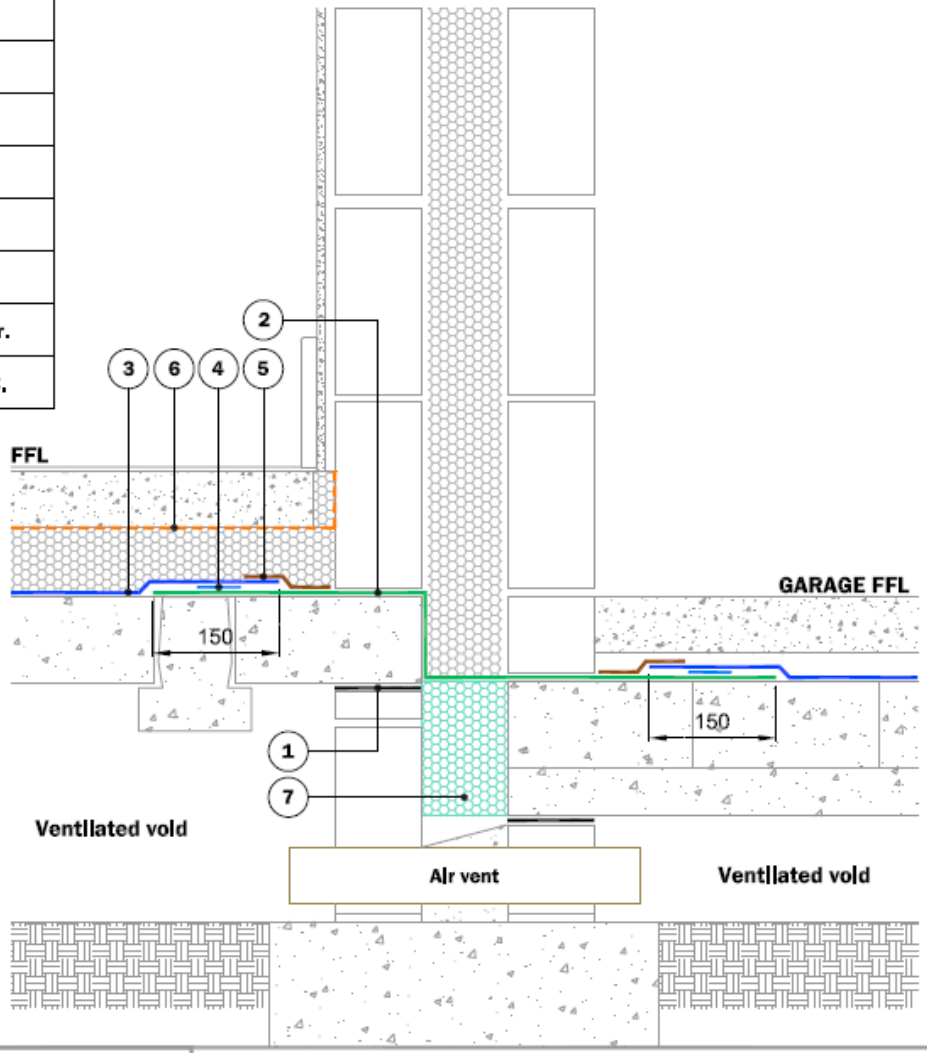


Photo No.8: Airbricks on either side of dwelling

APPENDIX C RECOMMENDED GAS PROTECTION PLAN

KEY TO MATERIALS :-	
1	Visqueen Zedex CPT DPC.
2	Visqueen GR 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 :-
All cavity work above DPC must be kept clear from any mortar droppings by use of a cavity drip batten, full-fill insulation or regular careful cleaning of cavities, avoiding damage to the DPC



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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 BS8102:2009.

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

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.

Standard Detail

www.visqueen.com

Scale : NTS

Date : Dec.2018

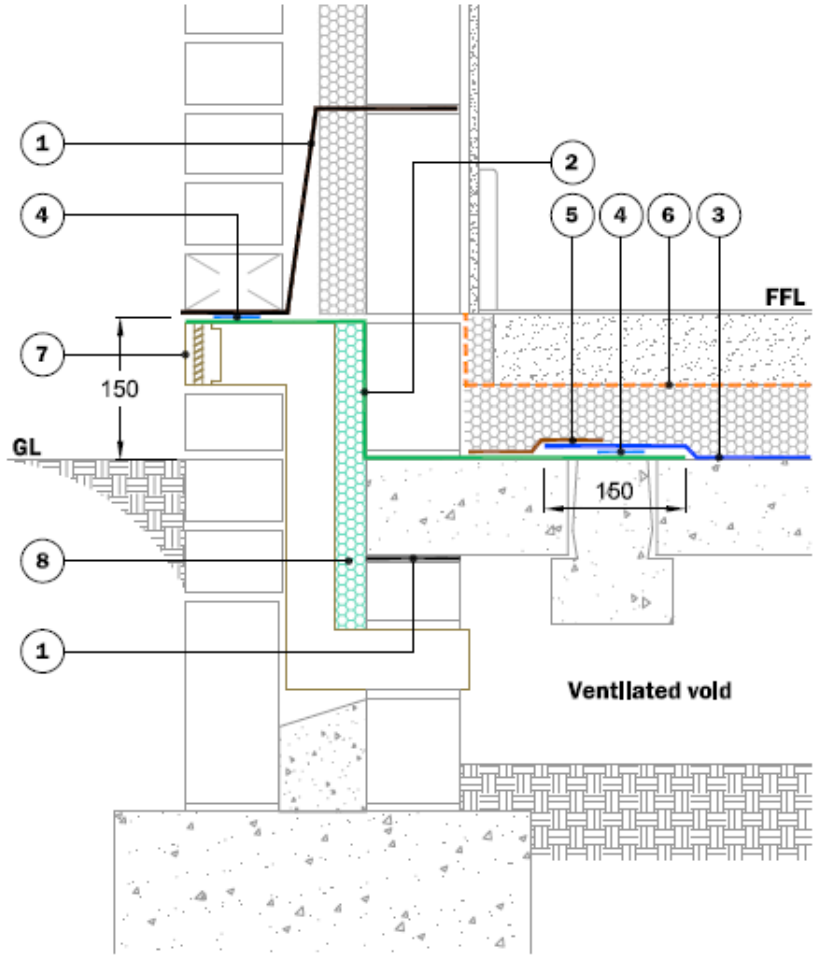
Drawing No : GB-06

VISQUEEN GAS BARRIER

Typical Internal House to Garage Cavity Wall Detail.

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

KEY TO MATERIALS :-	
1	Visqueen Zedex CPT DPC.
2	Visqueen GR 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	Visqueen Adjustable Z Vent & Air Brick.
8	Rigid Insulation by others to support gas DPC.



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Do Not Scale - Use Figured Dimensions Only.

Standard Detail

www.visqueen.com

Scale : NTS

Date : Dec.2018

Drawing No : GB-02

VISQUEEN GAS BARRIER

Typical Edge Detail - Suspended Slab, Option 2.

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