

Gas Protection Scheme Proposal

12 Heulfan Way, Garage Extension

This document details the proposed Gas Protection Scheme for Garage Extension, 12 Heulfan Way in line with the planning condition stated within Planning Permission ref. P/2013/0337.

P/2013/0337

Introduction

This document details the proposed Gas Protection Scheme for Garage Extension, 12 Heulfan Way in line with the planning condition stated within Planning Permission ref. P/2013/0337.

Details of the existing Gas Protection measures installed by Persimmon Homes during the construction of the existing garage structure are included and the intention is to apply the same design scheme to the new garage structure. The details of the existing scheme included have been found by exploratory excavation of the existing floor structure.

The proposed Gas Protection measures will utilise products from Visqueen Building Supplies' Gas protection range. They will be installed in accordance with Visqueen's manufacturer instructions, and in line with the design scheme and methodology detailed within this document. The proposal will match the level of protection offered by the current situation installed by Persimmon Homes. It can be said, that some improvement can be expected due to the improved, and correct installation methodology, as proposed.

Specification details for all products proposed are included within this document.

Installation Validation is proposed by means of a Verification report detailing photographic evidence of the installation taken at fundamental steps, along with details of products used and photographs of product labels. This shall provide the evidence that the installation has been carried out in accordance with the design scheme detailed within this document. Product labels shall also be retained, short term, for inspection if required. Should this not be deemed adequate for a non-habitable detached garage, an independent inspection by Professional Environmental Consultants, post installation, shall be carried out if absolutely necessary. This is to be confirmed by Wrexham County Borough Council.

Existing Gas Protection Measures

The existing Gas protection measures utilise Blue, Foil Backed Gas Barrier Membrane (Fig.2), over a 125mm granular layer of 40-60mm hardcore and building sand mix (Fig.4). This granular layer is directly vented to the outside perimeter of the structure by means of 4 air bricks (2 on each side wall) (Fig.6). A sacrificial layer of Visqueen vapour barrier is laid on top of the granular layer, directly below the gas membrane. The gas membrane is sealed to Foil Backed Damp Proof Course (which extends through the brickwork) by means of double sided jointing tape with an overlap of approximately 150mm. Note: No foil lapping tape has been used to seal the joints. The concrete floor and associated steel reinforcing structure is then laid directly on top of the gas membrane (Fig.5).

The following photographs detail the installation.



Figure 1 – Existing Membranes



Figure 2 – Gas Barrier Membrane



Figure 3 – Foil Backed DPC.



Figure 4 – Granular Layer below Gas Barrier and sacrificial membrane.



Figure 5 – Overall Installation.



Figure 6 – Air Brick Detail

Proposed Gas Protection Measures Methodology – New Building

Gas Barrier Membrane

The proposed gas protection scheme will utilise “Visqueen Gas Barrier” as the core gas membrane. The corresponding datasheet, BBA Certificate and Performance Declaration can be found in Appendices 1 to 3.

The membrane will be laid in two or three strips (dependent on roll width availability), overlapped a minimum of 150mm and bonded with “Visqueen Double Sided Tape” (Appendix 4). The joint(s) shall then be secured with “Visqueen Foil Backed Girth Jointing Tape” (Appendix 4). It shall be ensured that the membrane is clean and dry at the time of jointing to ensure a sound joint. The installation procedure is detailed below in Figure 7:

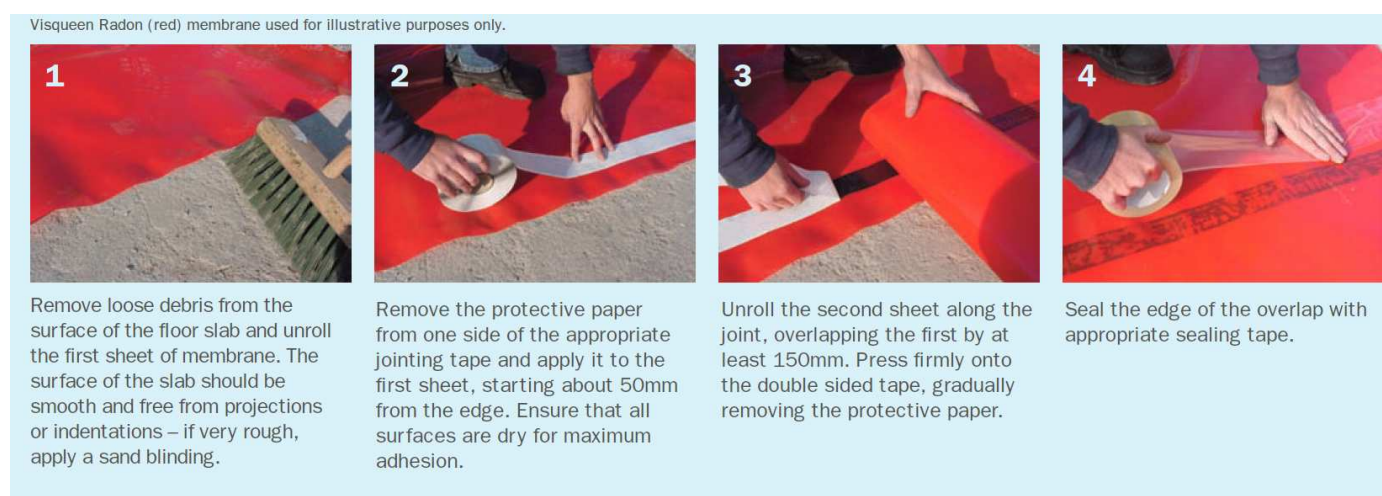


Figure 7 – Gas Barrier Installation Details

“Visqueen Gas Resistant DPC” shall be taken through the brickwork (as per existing scheme – Fig.1) to the outerleaf to avoid slip or shear planes on the gas barrier. The gas barrier shall overlap the DPC by a minimum of 150mm and bonded with “Visqueen Double Sided Tape” (Appendix 4). The joint(s) shall then be secured with “Visqueen Foil Backed Girth Jointing Tape” (Appendix 4). It shall be ensured that the membrane is clean and dry at the time of jointing to ensure a sound joint. The installation procedure is detailed below:



Figure 8 – Gas Barrier to DPC Installation Details

Service Entries

Two off 110mm service entries will be sealed to the membrane by utilising Visqueen Preformed Pipe Sleeves (Top-Hats), as detailed below in Figure 9. The specification details for these units can be found in Appendix 4.

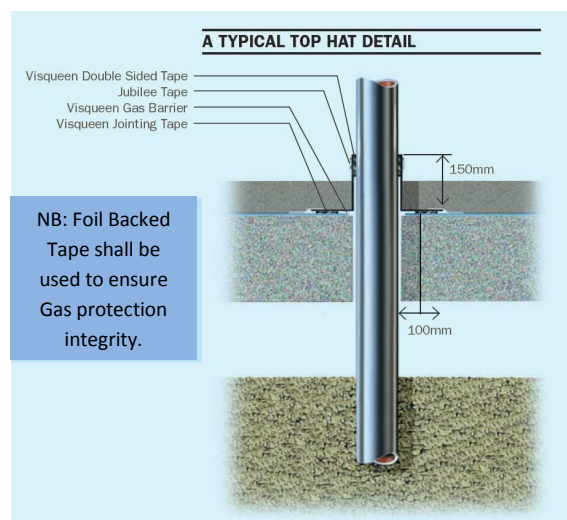


Figure 9 – Typical Top Hat Detail

The Preformed Pipe Sleeves shall be installed using “Visqueen Double Sided Tape” and “Visqueen Foil Backed Girth Jointing Tape” (Appendix 4). It shall be ensured that the membrane and top hat unit is clean and dry at the time of joining to ensure a sound joint. The installation procedure is detailed below:

Visqueen Radon (red) membrane used for illustrative purposes only.

1	2	3	4
Cut a circular hole in the membrane as close as possible to the pipe, or pipe socket. Ensure that pipe penetrations do not occur at joints in the membrane.	With the pipe in position, slide the Visqueen Preformed Top Hat Unit over the pipe (various diameters are available – 110mm being the most common).	Mark the extent of the square horizontal skirt over the membrane and also mark the line of the top of the top hat unit around the pipe.	Raise the top hat unit and cut four lengths of Visqueen Double Sided Tape, one for each side of the horizontal skirt. Allowing for an overlap at each corner. Cut one length to go round the pipe.
5	6	7	8
Start to remove the protective paper from the double sided tape around the pipe and raise it up at an angle so that it will project above the top hat unit when it is stuck to the membrane.	Release the protective paper from each of the four lengths of double sided tape. Lower the top hat unit, ensuring that the free end of the protective paper around the pipe is reachable, and seal the horizontal skirt to the membrane.	Gradually remove the remainder of the protective paper from the double sided tape around the pipe.	Seal the junction of the horizontal skirt and the membrane with the appropriate sealing tape and secure the top hat unit to the pipe with a jubilee clip.

Figure 10 –Top Hat Installation Details

Granular Layer Ventilation

A 150mm granular layer shall be installed below the gas barrier to aid dilution and dispersion of any ground gases. This will be formed using 20mm minimum, well compacted, clean hardcore. This will not be mixed with sand and will also be increased in depth by 25mm in comparison to the existing scheme (Fig.4). This granular layer will be in direct contact and alignment of air vents with cavity sleeves through both leaves of the wall to allow ventilation to the exterior of the building, as detailed in Figure 12.

A sacrificial membrane of minimum thickness of 300µm shall be installed on top of the granular layer. This membrane will then be covered with a layer of sand blinding prior to the installation of the gas membrane to ensure adequate protection of the gas membrane, as detailed in Figure 12.

The gas membrane shall also be suitably protected with a sand blinding layer prior to installation of a 200mm fibre-based concrete floor slab / remaining brickwork. Note, the floor slab shall be installed as soon as practically possible following installation of the membrane to protect the membrane from damage in line with the installation guidelines from Visqueen Building Products.

Ventilation to the exterior of the building shall be provided by installing “Timloc” air bricks in conjunction with cavity sleeves (See Appendix 5 for datasheet). These will allow gases to disperse to the atmosphere. Where these air vents fall below ground level, a 200 - 250mm wide granular trench shall be installed to a depth suitable to reach the bottom of the air vent. These air bricks are the equivalent of 6170mm² area. A total of 10 air bricks shall be installed as detailed below, in Figure 11. This will allow the equivalent of 61,700mm² area. Based on a building footprint of 32.8m² and wall lengths of 8m, this equates to 1,881mm² ventilation per square metre of floor or 3,085mm² ventilation per metre run of wall. This is a significant increase to that of the existing structure (1690mm² per square metre of floor or 2285mm² per metre run of wall).

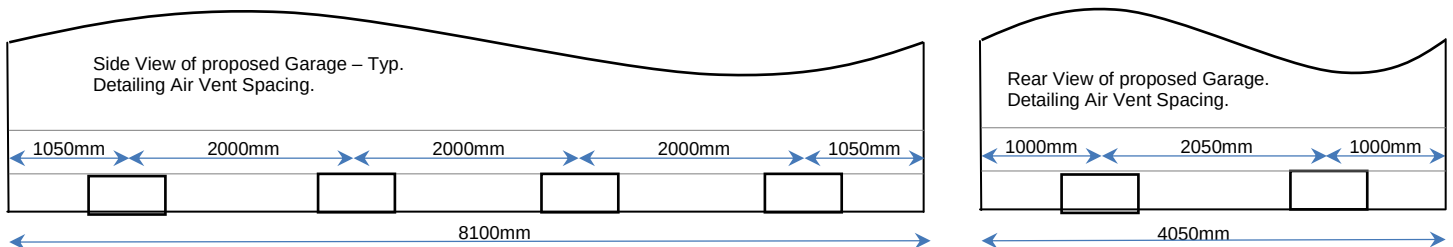


Figure 11 –Air Ventilation Installation Details

Edge Detail

Figure 12, below illustrates the edge detail of the installation in it's entirety:

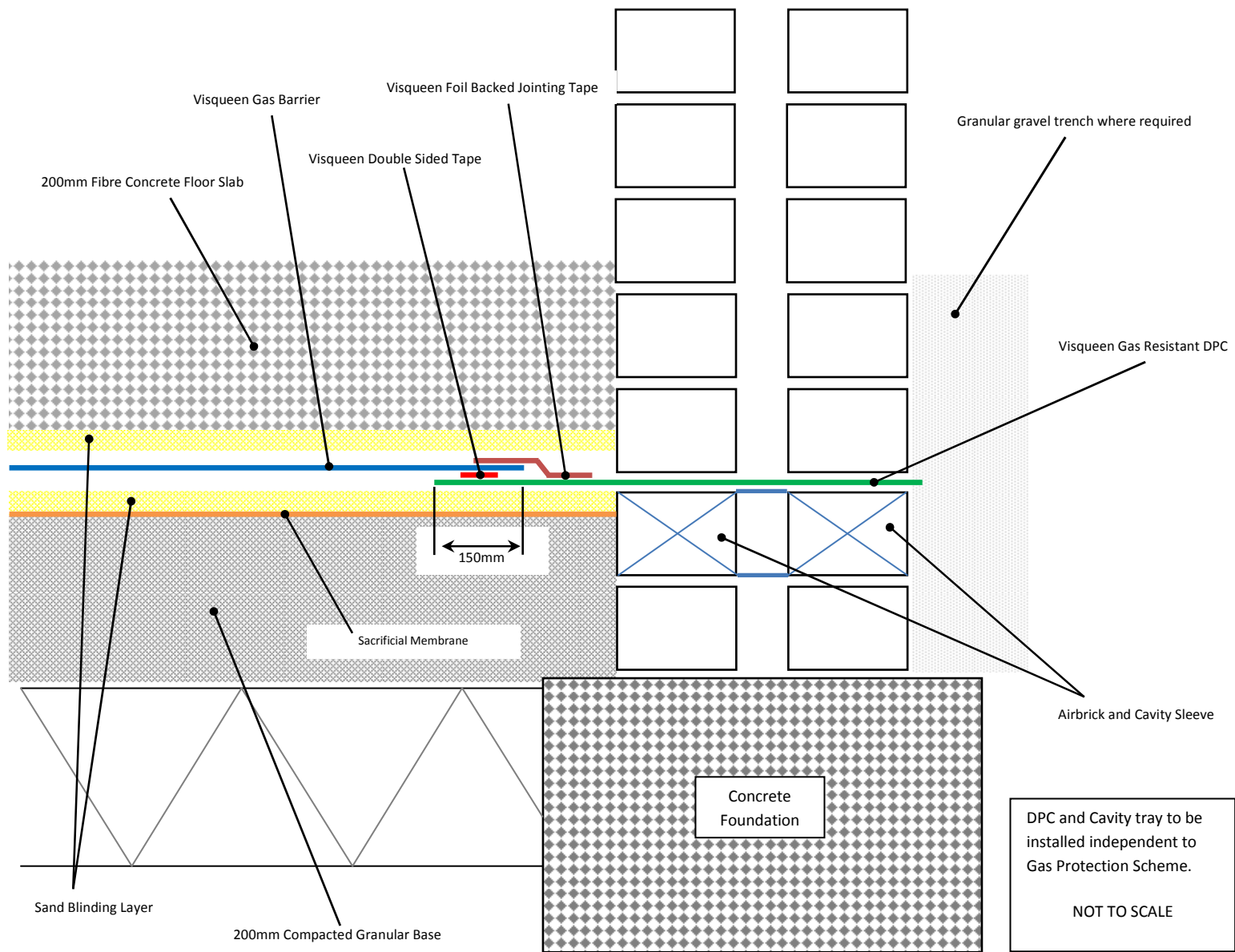


Figure 12 – Proposed Gas Protection Scheme Edge Detail

Appendices

Appendix	Description
1	Visqueen Gas Barrier Datasheet
2	Visqueen Gas Barrier BBA Certificate
3	Visqueen Gas Barrier Declaration of Performance
4	Visqueen Gas Protection System Components Datasheet
5	Timloc Air Brick Product Datasheet



Appendix 1.



Appendix 2



Appendix 3



Appendix 4



Appendix 5