

Our Ref: E19/7349/MH/004A – Rev A

26 May 2021

**FAO Andrew Ratcliffe**

C/o Ryan Lewis  
Martin Walsh Architectural.  
99-103 Leeds Road  
Dewsbury  
West Yorks  
WF12 7BU

Dear Sir,

**Re: Development at Egypt Farm, Cleckheaton**

Further to your request we have attended site to undertake an inspection of the gas membrane to confirm that the quality of the installation is satisfactory to the converted barn at the above project.

Following completion of the gas monitoring on site, our report E18/7349/R002 established that due to the increased gas levels it would be prudent that the site be characterised as **Amber 2** under the NHBC traffic light system, due to the consistent elevated levels of carbon dioxide in the proximity of the former barn, and the potential for long term build up beneath the ground floor slab.

When consulting BS 8485:2015 Table 2 the site can be characterised as CS2 for Type A buildings. Consulting tables 5 - 7 we would recommend the following to achieve a score of 4.5:

- Fully vented minimum 150mm deep void below suspended slab. 2.5 Points  
To be increased to 250mm where the proximity of trees affects the foundation construction.
- Continuous membrane across the cavity/party walls. 0 Points
- Cavity tray in the external walls. 0 Points
- Fully sealed service entries and ducts to manufactures specification. 0 Points
- Beam and block floor slab 0 Points
- A Visqueen Gas Barrier meeting all of the following criteria: 2.0 Points
  - Sufficiently impervious to gasses with a methane gas Transmission rate <40.0ml/day/m<sup>2</sup>/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1 manometric method).
  - Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas Emissions.
  - Sufficiently strong to withstand in-service stresses

(eg. Settlement if placed below a flood slab).

- Sufficiently strong to withstand the installation process  
And following trades until covered (eg. Penetrations  
From steel fibres in fibre reinforced concrete,  
Penetration from reinforcement ties, tearing due to  
Working above it, dropping tools etc.)
- Capable, after installation, of providing a complete  
Barrier to the entry of the relevant gas.
- Verified in accordance with CIRIA C735 [N1]

Total

**4.5 Points**

Gas measures will need to be retrofitted to the existing buildings on site. This will require the excavation of the existing ground floors, in order to construct a new beam and block floor to create a vented void beneath the ground floor slab area. This will likely require underpinning to be carried out, in order to deepen the foundations to a point where a sufficiently deep void can be implemented. Once sufficient ground has been excavated, and ventilation measures implemented, a new ground floor slab should be laid, and a gas membrane overlain.

In addition to the above a new blockwork internal leaf will be constructed to create a cavity to the existing 440mm thick solid external wall.

### **Installation**

In accordance with NHBC requirements, installation of the gas membrane should be carried out by a suitably qualified person.

Prior to work commencing on site it was agreed with the developer that the gas membrane installation would take place in a 2 stage process.

Stage 1 – Installation of the correct dpc and air bricks through the existing external wall. Leaving sufficient overlap to allow installation of the floor membrane at a later date.

Stage 2 – Once the property was constructed and weather tight the floor membrane was to be installed and sealed against the overlap from the cavity membrane. Following inspection, the floor is to be immediately insulated and screed poured to prevent potential damage to the membrane.

Installation of the membrane should be in accordance with the manufacturer's specification and standard details.

### **Inspection Procedure**

Inspection of the membrane was undertaken in a two-stage process to suit the installation of the membrane. These initial visits were undertaken on the 16<sup>th</sup> and 25<sup>th</sup> October 2018 and the stage 2 visit on the 6<sup>th</sup> Feb 2019.

Stage 1 – Inspect the property at DPC level once the membrane had been laid across the new cavity/ party walls. Air brick spacing and sub-floor void were also inspected.

Stage 2 – Inspect the property once the full floor membrane has been laid and sealed prior to the insulation being laid.

## **Validation**

Installation of the membranes were carried out by the groundworkers involved in the construction of the on site development.

The detailing and sealing of the membrane was of a good standard on site.

We can therefore confirm that the installation of the gas membrane is satisfactory to comply with NHBC Amber 2 conditions for residential properties. Sample site photographs are attached. A site plan is also attached indicating location of the photographs.

## **Photographs Index**

1. Partial installation of beam and block floor showing void below floor.
2. Is typical of the installation which shows the gas Aldercourse with is heat sealed to the floor and primed abutting wall. Where joints lap, gas tape is used to form the seal. The top hat, is then sealed on top of the Aldercourse using gas tape which adheres to the Aldercourse. Where the soil and vent pipe protrudes through the top hat, gas tape is used to seal this joint.  
  
The area that can be seen which is still a blockwork floor then has the reinforced Alderprufe (blue) gas membrane adhered to the Aldercourse using gas tape.
3. Aldercourse GRA joints bonded and sealed at step in floor level. Awaiting installation of periscopic vent to higher level.
4. Typical sealed periscopic vents at higher floor level on later site visit on 25<sup>th</sup> October 2019, Aldercourse GRA primed and heat sealed to wall and gas taped on overlap.
5. Alderprufe GRA laid and sealed to floor area using approved gas tape.
6. Vertical view of sealed periscopic vent.
7. Date stamp of manufactured Alderprufe – NB gas tape sealed 40mm back from free edge.
8. Typical sealed periscopic vents at higher floor level on later site visit on 25<sup>th</sup> October 2019, Aldercourse GRA prime and heat sealed to wall and gas tapered on overlap.
9. BBA approved Alderprufe gas membrane gas taped to Aldercourse GRA.
10. Alderprufe GRA membrane sealed fully installed – Note additional DPC cut back and overlaid to protect during construction.
11. Aldercourse GRA laid below internal masonry with black primer in readiness to accept Alderprufe membrane and taped to primer. Also standard DPC above used to protect membrane prior to insulation and screed being laid.
12. Aldercourse GRA laid below internal masonry with black primer in readiness to accept Alderprufe membrane and taped to primer. Also standard DPC above used to protect membrane prior to insulation and screed being laid.

I trust that the above is satisfactory, should you have any queries please do not hesitate to contact me direct.

In addition to the above gas membrane the majority of the external area will be a hard paved driveway. There will be small area to the front of the barn is to be finished with artificial grass this has been constructed off 450mm clean stone to break the pathway from the elevated arsenic identified in the original site investigation.

I trust that the above is satisfactory to yourselves, should you have any queries please do not hesitate to contact me direct.

Enclosures

Yours faithfully,

A handwritten signature in black ink, appearing to read 'M. Huddleston', with a stylized, cursive script.

MARTIN HUDDLESTON. MEng  
[martin@haighhuddleston.co.uk](mailto:martin@haighhuddleston.co.uk)



# Appendix

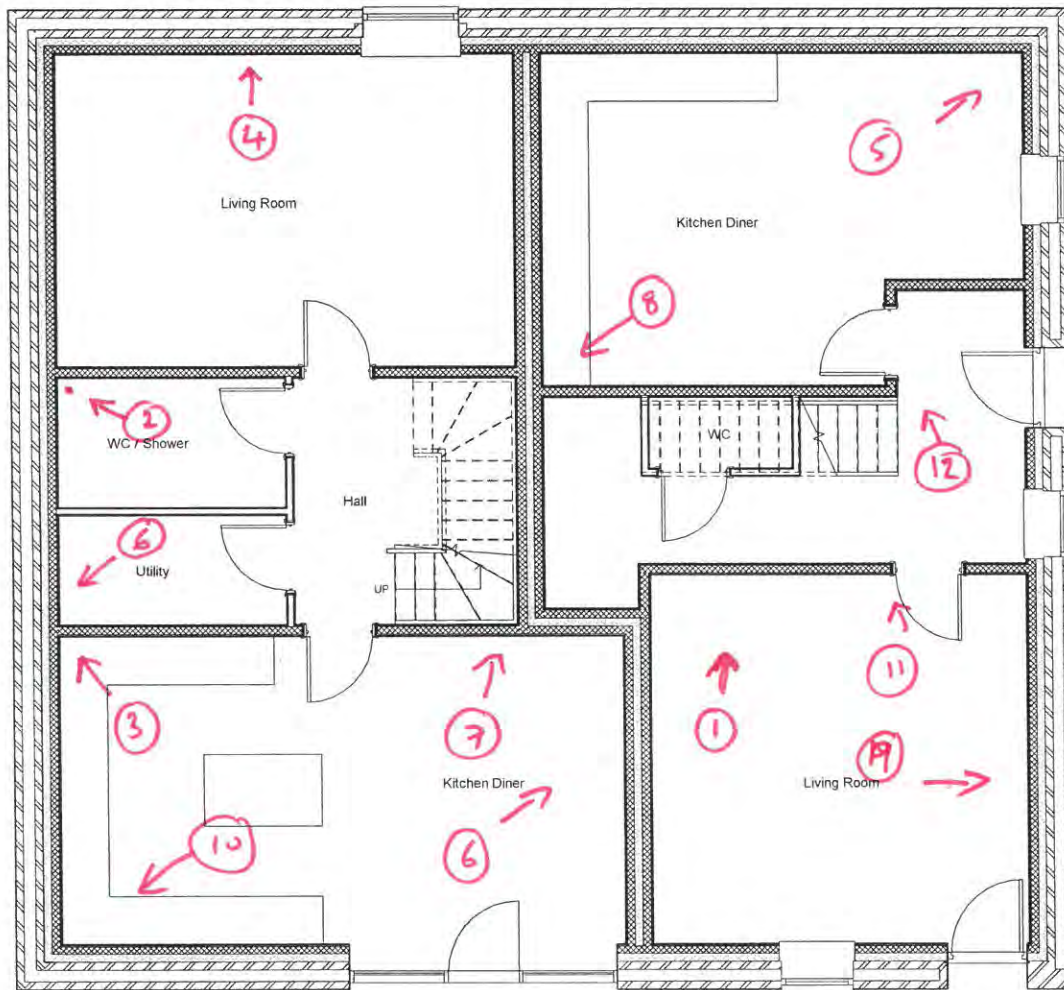
# Inspection Checklist

## VISUAL INSPECTION OF GAS PROTECTION MEASURES

| Site name: Egypt Farm Cleckheaton      |                                                      | Gas characteristic situation: Amber 2                                                              |
|----------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Job number: EI8/7349                   |                                                      | Type of development and building/block checked: Residential                                        |
| Date: 19.02.19                         |                                                      | Building description: Plots 3-13                                                                   |
| Visit by: MH                           |                                                      | Foundation type: Beam & Block                                                                      |
| Weather at time of inspection: Cloudy  |                                                      | Gas protection type: passive                                                                       |
| No                                     | Item                                                 | Comments                                                                                           |
| <b>1. Gas membrane</b>                 |                                                      |                                                                                                    |
| 1.1                                    | Condition of sub-grade and underside of gas membrane | Good                                                                                               |
| 1.2                                    | Gas membrane type                                    | Alderprufe Gas membrane GRA and Aldercourse GRA                                                    |
| 1.3                                    | Gas membrane condition                               | Good                                                                                               |
| 1.4                                    | Joining tape product                                 | Gas resistant silver foil tape.<br>Gas resistant bituminous welded.                                |
| 1.5                                    | Lapping design                                       | In accordance with manufacturers details.<br>100mm Min overlap between floor and cavity membranes. |
| 1.6                                    | Laps, welds and joints seals                         | Good. Joints welded and sealed with double sided tape where required.                              |
| 1.7                                    | Service entries seals                                | Top hats present. Sealing good.                                                                    |
| <b>2. Passive venting</b>              |                                                      |                                                                                                    |
| 2.1                                    | Sub-floor void                                       | Min 150mm achieved. Void unobstructed.                                                             |
| 2.2                                    | External wall airbricks                              | Present. No more than 2m spacings                                                                  |
| 2.3                                    | Internal sleeper walls                               | Vents present in line with air bricks in accordance with foundation drawings.                      |
| 2.4                                    | External vent trenches/ducts                         | N/A                                                                                                |
| <b>3. Active venting</b>               |                                                      |                                                                                                    |
| 3.1                                    | System details                                       | N/A                                                                                                |
| Additional notes:                      |                                                      |                                                                                                    |
| The gas protection measures inspected: |                                                      | <b>A are acceptable and comply with the specification</b>                                          |
|                                        |                                                      | B are acceptable but attention is drawn to issues related to item no. xxx                          |
|                                        |                                                      | C are not acceptable due to the issues related to item no. xxx                                     |

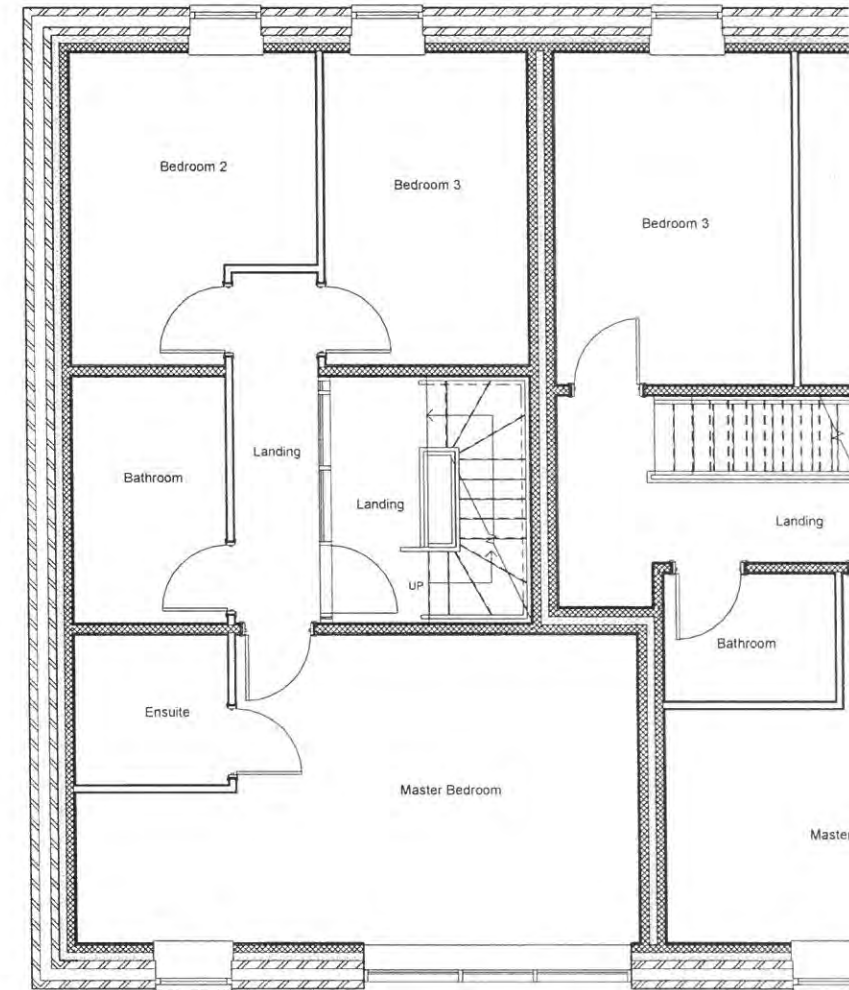
Name: Martin Huddleston      Signature:      Date: 18.02.19

# PHOTOGRAPHS



**Ground Floor**  
1 : 50

LOCATION PLAN OF PHOTOGRAPHS



**First Floor**  
1 : 50



























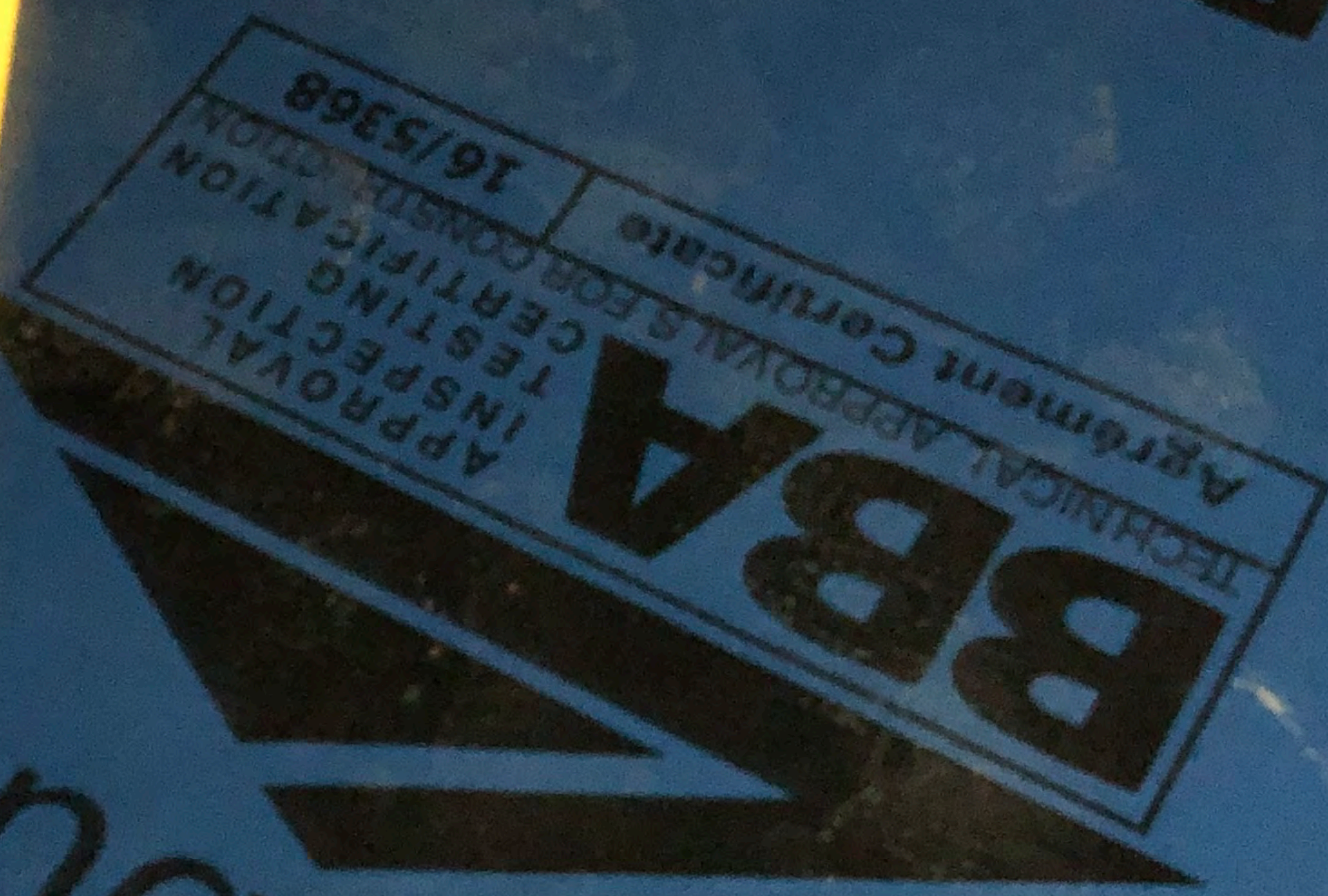


18:40 02.10.2019





MEMBRANE



MEMBRANE





**BBA**

APPROVA  
INSPECT  
TESTING  
CERTIFIC

TECHNICAL APPROVALS FOR CONSTRUCTION

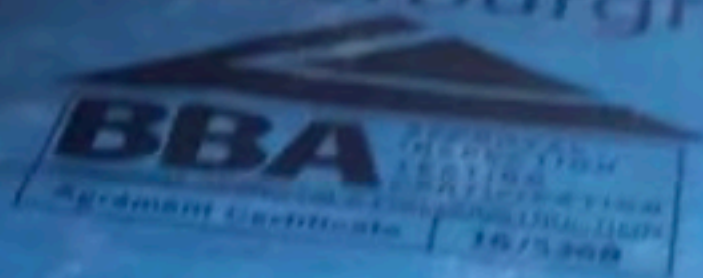
Accrément Certificate

16



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# DETAILS OF GAS MEMBRANE



**Alderprufe GRA** Gas Barrier is a multilayer, low-density polyethylene membrane, reinforced with a polypropylene reinforcing grid with an integral aluminium foil (BBA 16/5368) for use above or below a concrete ground floors that are not subject to hydrostatic pressure, to protect buildings against gas penetration from the ground.

## General Description

**Alderprufe GRA** is a proprietary gas barrier that is compliant with **BS8485:2015**, **Ciria 665** and is suitable for **Amber 1 & 2** applications. It provides an effective barrier to methane, carbon dioxide, radon, and hydrocarbon vapours; as **Ciria C748** notes, aluminium simply does not allow any permeation of almost any common organic pollutant.

It can be installed above or below a slab, above or below insulation or beneath a screed.

The methods of jointing provide an effective barrier to the passage of gases, hydrocarbon vapours, liquid water and water vapour from the ground.

**Alderprufe GRA** is suitable for use in accordance with the relevant clauses of CP102:1973 Code of Practice for protection of buildings against water from the ground (as amended), in concrete floors not subject to a hydrostatic pressure, and will meet Requirement of Building Regulations Approved Document C (England and Wales), in that sheet thickness is at least 1000 gauge.

**Alderprufe GRA** has a high resistance to puncture. On smooth or blinded surfaces it will not be damaged by normal on-site foot traffic but care should be taken to avoid damage during installation, particularly when handling building materials and equipment over the surface and when placing concrete or screed since it can be punctured by sharp objects.

**Alderprufe GRA** may be installed under all conditions normal to the construction of ground floor slabs.

The membranes remain flexible and do not soften at the extreme temperatures likely to occur in practice. When used in accordance with the manufacturer's instructions there will be no adverse effect on the membranes from underfloor heating under normal conditions of use, **Alderprufe GRA** will provide an effective barrier to the transmission of gases, liquid water and water vapour for the life of the concrete slab in which it is installed.





## ALDERPRUFE GRA GAS BARRIER

| Characteristic                                                                             | Test Method      | Unit                       | Alderprufe GRA |
|--------------------------------------------------------------------------------------------|------------------|----------------------------|----------------|
| <b>Physical Properties</b>                                                                 |                  |                            |                |
| Thickness                                                                                  | EN 1849-2        | mm                         | 0.60           |
| Width                                                                                      | EN 1849-2        | m                          | 2              |
| Length                                                                                     | EN 1849-2        | m                          | 50 / 25        |
| Weight                                                                                     | EN 1849-2        | g/m <sup>2</sup>           | 350            |
| <b>Gas Permeability</b>                                                                    |                  |                            |                |
| Methane                                                                                    | EN ISO 15105 - 1 | ml/m <sup>2</sup> /day/atm | 0.09           |
| Carbon Dioxide                                                                             | EN ISO 15105 - 1 | ml/m <sup>2</sup> /day/atm | 0.09           |
| Radon                                                                                      | K124/02/95       | m <sup>2</sup> /s          | 8.00           |
| Water Vapour Transmission                                                                  | EN 1931          | g/m <sup>2</sup> /day      | 0.10           |
| Complies with:<br>BS8485:2015, CIRIA C664, CIRIA C748, NHBC (Green Amber 1, Amber 2, Red), |                  |                            |                |

### Installation

Unless the base is smooth, a surface blinding of soft sand or **Geotex 300PP** protection should be used to avoid puncturing the membrane during installation or when the concrete or screed is being placed.

Before jointing, sheets must be clean and free from dirt and grease. Adjacent sheets should be overlapped by at least 100mm wide and bonded with 100mm wide double-sided **Gastite Tape**.

Perforation or puncture of the sheets should be patched with sheets of identical thickness lapped at least 150mm beyond the limit of the puncture and sealed with 100mm wide **Gastite Tape**.

Continuity with DPC: **Alderprufe GRA** membrane must be continuous with damp-proof course in the surrounding walls; lapped and bonded to **Aldercourse GRA** gas dpc for continuation through load-bearing walls. Where necessary **Alderprufe MR50** should be used as a vertical course to link the two (refer to typical details and separate data sheets.)

Placing Concrete or Screed: **Alderprufe GRA** must be covered by a screed or other protective layer as soon as possible after installation. Care should be taken to ensure that the membrane is not stretched or displaced when placing the concrete or screed.

Best practice is to use pre-formed collars and cloaks at penetration to the gas barrier, for example at columns, pipes or piles. If gas ventilation is needed, refer to **Aldervent Gas Ventilation** brochure.

**Use with:** Aldercourse GRA gas dpc \* Gastite Tape \* Preformed pipe collars, column cloaks, pile collars \* Geotex 300PP or Backerboard HD protection \* Membrane Holdfast \* Alderprufe MR50



# **ALDERCOURSE GRA**

**Aldercourse GRA** is an aluminium cored high performance damp-proof course, to maintain the integrity of the gas barrier system in load-bearing locations. Used in combination with all Alderprufe gas barriers it provides a continuous “through the wall to floor” junction.

**Aldercourse GRA** is a laminate of aluminium, high quality oxidised bitumen and hessian, surfaced with a light sand finish, and is compliant with **BS8485:2015** and **BS6398**. The aluminium layer provides an effective barrier to VOC as noted in **Ciria C748**. **Aldercourse GRA** can be heat-bonded to masonry, and in addition to gas barrier applications, it can also be used in cavity tray applications including parapet walls and beneath copings and cappings.



## *Priming*

Any surface to which **Aldercourse GRA** will be heat bonded must be primed with one coat of **Tac Primer** at a rate of 0.1 to 0.3 litres per m<sup>2</sup> dependent on the porosity of the surface. The primer must be allowed to dry thoroughly before applying **Aldercourse GRA**.

## *Application*

**Aldercourse GRA** Damp-proof course should be laid on a wet mortar bed in accordance with British Standards Codes of Practice. All laps of Aldercourse to Aldercourse must be secured by heat bonding, and should be a minimum of 150mm. Laps between Alderprufe gas barriers and **Aldercourse GRA** should be secured as follows:

- A ‘tail’ of **Aldercourse GRA** dpc should extend onto the slab by a minimum of 150mm; the top surface of the **Aldercourse GRA** should be softened by use of a gas torch to allow the bitumen to become viscous; Gastite Tape should be applied to the exposed surface. **Alderprufe gas barrier** should then be applied Gastite Tape, and the joint rolled well for good adhesion.

### ALDERCOURSE GRA GAS DPC

| Characteristic                                                                                                                    | Test Method      | Unit                       | Aldercourse GRA         |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|-------------------------|
| <b>Physical Properties</b>                                                                                                        |                  |                            |                         |
| Thickness                                                                                                                         | EN 1849-2        | mm                         | 3.2                     |
| Width (400mm, 500mm, 600mm, 1000mm are standard widths)                                                                           | EN 1849-2        | m                          | various                 |
| Length                                                                                                                            | EN 1849-2        | m                          | 8                       |
| Weight                                                                                                                            | EN 1849-2        | g/m <sup>2</sup>           | 4000                    |
| <b>Gas Permeability</b>                                                                                                           |                  |                            |                         |
| Methane                                                                                                                           | EN ISO 15105 - 1 | ml/m <sup>2</sup> /day/atm | 0.98                    |
| Carbon Dioxide                                                                                                                    | EN ISO 15105 - 1 | ml/m <sup>2</sup> /day/atm | 0.28                    |
| Radon                                                                                                                             | K12/05/95        | m <sup>2</sup> /s          | 1.5 x 10 <sup>-14</sup> |
| Complies with:-<br>BS8485:2015, CIRIA 665, NHBC (Green Amber 1, Amber 2, Red), CIRIA C748 (*vapours - impermeable aluminium core) |                  |                            |                         |

**Use with:** Alderprufe GRA\* Alderprufe MR50 \* Alderprufe Ultra VOCM \* Alderprufe HC \* Alderprufe GRM \* Super Yellow Gas Barrier \* Alderprufe Tuflex \* Alderprufe LGM Liquid Gas Membrane