### Radon protection

**Is radon gas present?**

| Yes / No | If unsure, check with NHBC surveyor / engineer for clarification |

Please specify floor design and level of protection required:

<table>
<thead>
<tr>
<th>Ground bearing</th>
<th>Suspended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic:</td>
<td></td>
</tr>
<tr>
<td>Full:</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Where high radon protection is required, depressurisation/ventilation (either a radon sump or a ventilated subfloor void) should be provided below the level of the radon barrier.

**Note:** If the site is in an area known for a high or fluctuating water table, there is a risk that radon sumps may become waterlogged. As such, tanking should be used to prevent water ingress and provide radon protection.

Please specify the membrane barrier to be installed:

**Note:** If a recycled product is being used, ensure that it provides the same or better level of protection and longevity as that offered by 300 micrometre (1200 gauge) virgin polyethylene.

### Other gas protection

**Is methane/carbon dioxide or other hazardous gas (i.e. Hydrocarbons) present?**

| Yes / No | If unsure, check with NHBC surveyor / engineer for clarification |

Has the level of gas regime been defined?

<table>
<thead>
<tr>
<th>Amber 1</th>
<th>Amber 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Risk</td>
<td>High Risk</td>
</tr>
<tr>
<td>CS2</td>
<td>CS3</td>
</tr>
</tbody>
</table>

**Note:** Ensure the gas risk assessment report has been accepted by NHBC Surveyor/Engineer.

**Note:** Amber2/CS3 gas regimes are considered high risk. It is essential that the gas risk assessment & construction detail is agreed in advance of works.

**Note:** Verification of measures will be requested for CS3/Amber2 sites. The verification plan should be discussed in advance of construction.

**Note:** The opportunity to provide post construction evidence will be difficult, costly & disruptive.

### Gas protection measures

**Have gas protection measures been agreed?**

<table>
<thead>
<tr>
<th>Yes / No</th>
<th>Ground bearing</th>
<th>Suspended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane specification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight Polymeric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforced product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-layer with aluminium insert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrocarbon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist membrane</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Minimum 1200 gauge. Technical specification datasheets should provide test permeation data.

**Note:** Only virgin products (non-recycled) to be used.

**Note:** Membrane should be suitable for level of gas risk, nature of construction & durable.

**Note:** Specialist membrane may be required where hydrocarbon vapours are present.

**Sub slab ventilation**

| Clear void | Geosrips | Void former | Granular venting blanket | Venting pipes |

**Note:** Sub Slab ventilation (or pressure relief system) is required where gas protection measures are needed.

**Note:** A specialist system will be required where ground bearing slabs adopted

**Note:** The layout & connectors require specialist design.

**Note:** Granular blankets with venting pipes require specialist design.

**Note:** If the site is in an area known for a high or fluctuating water table, there is a risk that sub slab ventilation may become waterlogged & specialist advice is required.
### Has a specialist installer been employed to install the barrier system?

Yes / No

Note: For sites classed as Amber 2 or CS3, operatives should be suitably qualified. An NVQ Level 2 qualification is one example of specialist qualification.

Note: In all instances the installer should be familiar & appropriately experienced in gas membrane installations.

Note: Third party verification is required for Amber2/CS3 gas regime sites. The verifier should not be the installer.

### General requirements and considerations for radon and other gas protection

The barrier should be continuous across the whole plan of the building, including:
- taking it through or under internal wall and external walls,
- continuing across party or separating walls,
- provide an air tight seal around any penetrations through the barrier,
- Tapes and jointing should be specified in the design.

Where the barrier crosses the cavity, a cavity tray should be formed to prevent the ingress of water.

#### Membranes

- ![Image](membrane1.png)
- ![Image](membrane2.png)
- ![Image](membrane3.png)

Ensure product is sufficiently durable to withstand the construction process. Specialist installers may be required to joint thicker products. Specialist membranes may be required. Taped seams may not be appropriate.

#### Ventilation

- ![Image](ventilation1.png)
- ![Image](ventilation2.png)
- ![Image](ventilation3.png)

Specialist venting solution required for ground bearing slabs. Sub slab voids should be clear of debris. Venting pipes should be interleaved to prevent short circuiting & have more than one inlet & outlet point.

#### Ventilators

- ![Image](ventilator1.png)
- ![Image](ventilator2.png)
- ![Image](ventilator3.png)

Ensure telescopic ventilators are adequate. Photo shows ventilator too short & disconnected. Vents should not be susceptible to clogging. Refer to Technical Guidance 6.1/27. Planting proposals must consider air brick positions & not hinder air flow.

#### Installation

- ![Image](installation1.png)
- ![Image](installation2.png)
- ![Image](installation3.png)

Vertical walls & steps require specialist products & knowledge/skills to install. The product needs sufficient strength, detailing & adherence across steps. Preformed components offer solutions for difficult detailing.

- ![Image](installation4.png)
- ![Image](installation5.png)
- ![Image](installation6.png)

Thicker membranes advisable under position of sleeper walls. Timber frame sole plate must not damage membrane integrity. Weld temperatures are critical. Example shows burning of membrane.