

# radon newbuild : model solution

## No 4. Protecting new extensions - supplementary guidance

### **The need to provide radon protection**

If you are building an extension to an existing dwelling in England and Wales you must comply with the requirements of the Building Regulations 1991 for England and Wales, unless an exemption is provided in Schedule 2 of the Building Regulations. Requirement C2 of Schedule 1 of the Building Regulations states that : "precautions shall be taken to avoid danger to health and safety caused by substances found on or in the ground to be covered by the building". As a consequence in areas at risk from radon you may need to provide radon protective measures within the new extension.

Requirement C2 also directs the reader to more detailed guidance, contained within a BRE Report - *BR211 (1999 edition) Radon: Guidance on protective measures for new dwellings*. Within the report there are two sets of maps that should be consulted to identify those areas of the country where protective measures are required. All extensions to dwellings that fall into coloured or shaded grid squares on the maps will require radon membranes to be installed across the whole footprint of the new extension.

Reference is made within BR211 to the need in some areas of the country to obtain a geological assessment of radon potential in order to determine the level of radon protection to include within the new building works. For extensions there is little benefit to be gained by obtaining a geological assessment as the radon barrier is likely to cost little more than the assessment.

### **Protection Requirements**

Providing a radon membrane across the whole footprint of the new extension means having to provide a barrier within both the floor and walls of the new building. To work successfully the barrier needs to be carefully detailed and installed at the floor to wall junction. Model solutions showing detailing at these edge locations can be found elsewhere on this Website. For more detailed guidance you are advised to consult BR211. In areas where there is a greater risk the radon barrier should be supplemented by the inclusion of a radon sump or ventilated underfloor void.

The necessity of providing full radon protection (radon barrier *and sump*) within extensions is a matter of judgement for the Building Control Body. Large extensions that are designed to provide only ancillary accommodation may be re-arranged in the future to provide living accommodation. The size of the extension may be an indicator. If the extension is less than half the ground floor area of the existing house or 30m<sup>2</sup>, whichever is smaller, it could be considered to be relatively small. However, if the accommodation is designed as habitable space in the first instance radon protection should be provided at the appropriate level unless it is considered that full protection is not of significant benefit in which case dispensation under Regulation 8 could be considered.

Extensions with a ground floor area of more than half the ground floor area of the existing house or 30m<sup>2</sup>, whichever is the lesser, should have full radon protection if the house is in a dark brown square in Annex A or if a geological assessment indicates that full protection is advisable.

### **Small extensions**

If the extension is only to be used as a porch, utility room or cloakroom/ shower room occupiers are unlikely to spend much time in these parts of their home. In these circumstances it may be possible to set aside full radon protection if it does not exceed the ground floor area criteria but this is a matter of judgement for the Building Control Body. In such a case there may be no need to obtain a geological assessment or to provide a sump, as it would be of marginal benefit when considered with the risk to the whole of the house.

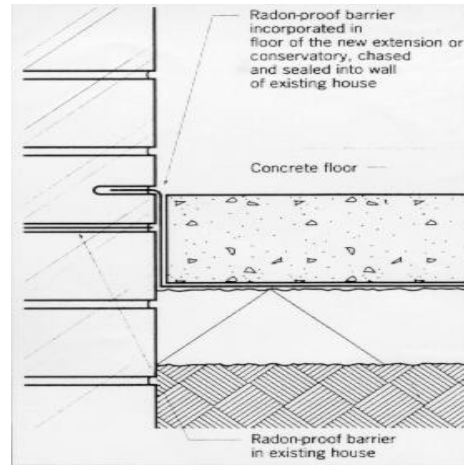
### Extension to house with radon protection

If the house being extended already has radon protection a similar level of protection should be provided to the extension.

### Sealing the joint between the existing dwelling and new extension

If possible, seal the construction joint between the new floor and the existing house. Where radon barriers have been incorporated in both the new floor and the existing floor, the aim should be to joint the two barriers where they meet within the wall of the house. In practice this is difficult to achieve without damaging the existing barrier.

A simpler alternative is to cut a chase in the wall slightly, above or below the existing barrier. The new barrier can then be tucked into the chase in the wall. This approach can also be used where the existing house does not have any radon protection. Whilst this is probably the best approach, other methods of joint sealing may be used e.g. bathroom sealant or other flexible filler.



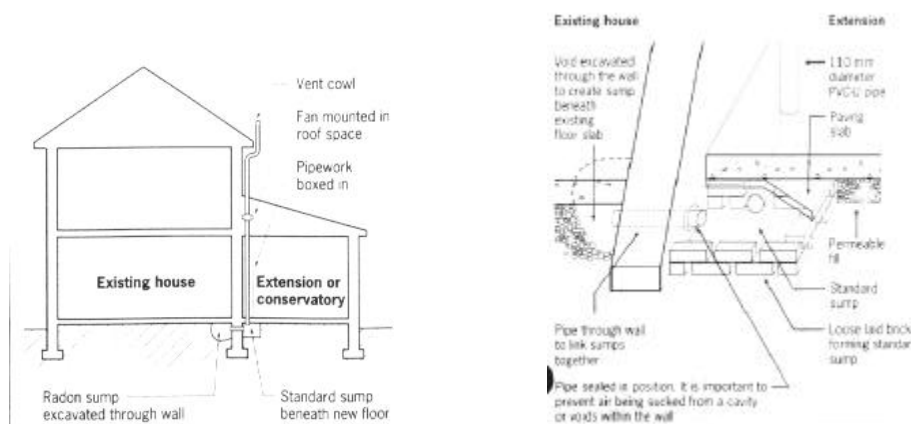
### Underfloor ventilation

If the existing house has a beam and block or suspended timber floor **care should be taken to ensure that the provision for sub-floor ventilation is maintained.**

### Best practice approach to planning an extension in a radon prone area

Householders planning to extend their homes in radon affected areas are recommended to have their homes measured for radon before plans are drawn up. Indoor radon levels fluctuate from season to season, day to day and by the hour. Therefore, to obtain reliable results, monitor radon levels over as long a period as is practical. The ideal is to monitor for three months using etch-track detectors. For further information on monitoring contact the National Radiological Protection Board

If the result exceeds the recommended action level of  $200 \text{ Bq/m}^3$  appropriate protection measures should be installed within the extension and radon reduction measures provided in the existing part of the house. In cases where a sump system is an appropriate remedy for the existing house it may be possible to construct a sump that can reduce radon levels in the existing house and provide protection to the new extension.



### Radon measurement before building an extension

If the existing house is measured for radon and it is found that radon levels in the home are well below the action level radon protective measures may be omitted from the extension. Measurement will need to be carried out using detectors, ideally placed for a three month period.

**Re-monitoring of homes on completion of extensions**

Even if you have taken the precautions against radon entry described in this guide, there is no guarantee that overall indoor radon levels will not rise when the extension has been completed. It is quite possible that radon which used to be harmlessly dispersed outside could now be diverted into the house by the new extension. Therefore it is advisable to test the whole house on completion.

**Note**

BRE have prepared this sheet to assist designers and installers in better understanding how practical cost effective radon protection can be provided within in new extensions to existing buildings. The information does not replace the technical requirements or guidance contained within BRE Report BR211(1999). Copies of BR211 can be obtained from the BRE Bookshop [WWW.BREBookshop.com](http://WWW.BREBookshop.com)