



A basement fitted with an ADD waterproofing system

It's a gas, gas, gas

Radon is a naturally occurring radioactive gas that seeps from the ground into buildings through the earth-retaining surfaces. Exposure to high levels of radon is a significant health hazard, and it is estimated by the Health Protection Agency (HPA) that over 2000 people in the UK die every year from lung cancer linked to radon exposure.

In properties without basements, the gas enters the building through the ground floor. A property with a basement, cellar or other partly below-ground area, however, will have several earth-retaining surfaces. Given the increased surface area in contact with the ground through which the gas can permeate, the potential for a property with a

As the popularity of basement conversions continues to increase, Rebecca Kench of specialist subcontractor ProTen Services explains why consideration must be given to radon gas.

basement to contain high levels of the carcinogenic gas is significantly increased.

Measures to control radon entry should be taken in all basements as, due to the nature of radon movement, its entry into the basement is foreseeable, even if at the present time a test reveals relatively low concentrations are present. This is the same principal as stipulated in BS 8102: Code of Practice for the Protection of Structures against Water from the Ground, whereby adequate waterproofing must be

provided as water entry into a basement is foreseeable, even if the structure is presently dry.

regulations apply to both new buildings, extensions and any basement conversion works. Approved Document C is currently being reviewed, with clearer and updated guidance due to be published in 2010.

Unfortunately, most methods used to control radon gas ingress into properties without basements are unviable, at least in part, for use below-ground, due to the way in which radon is drawn into properties.

Gas who?

Great care must always be taken when appointing a contractor to deal with radon, as without the correct training and knowledge of radon movement it would be easy to inadvertently increase levels of the gas in the property. For example, the installation of an extract fan in the basement will elevate radon levels by drawing more gas from the surrounding ground into the property.

Several membrane systems used for basement waterproofing have been certificated as suitable for providing radon protection. Whilst the material itself may provide a barrier to radon entry, it is vital that a radon specialist be involved in the

Always use a membrane system certified for radon gas protection



design and installation of the system, as the way in which it is used will affect its capabilities. Installed in the normal manner for waterproofing, a cavity drain membrane system is unlikely to provide effective radon protection and, in fact, has the potential to make the problem worse.

Cavity drain membranes are vulnerable to defect (a puncture is unlikely to affect its waterproofing qualities, but would let gas pass through), and by providing a barrier to entry in the basement could force radon in the soil to enter the property at ground-floor level, thus increasing the concentration in the rest of the property.

Entry level

ProTen Services have over 20 years' experience in dealing with radon gas, both in existing buildings and newbuilds. With an 80 year history in damp and waterproofing, the firm was ideally placed to develop a system able to achieve waterproofing to BS 8102 standard and also control radon gas entry.



Aquis Double Defence, known as ADD Waterproofing, is a patented system which uses a combination of cavity drainage membranes and air management. The combination of these components alongside the specific calibration of the air management system ensures that radon is unable to enter the basement or any other part of the building.

The system was successfully used in a basement conversion in Oxfordshire, where radon levels of 2600 bq/m³ (more than 10 times the Government's



recommended maximum limit) were originally found. The double vaulted basement also flooded during heavy rainfall, and so ADD Waterproofing was an ideal solution for the family, who wished to use the space as a playroom for their children. Once the works were completed, a radon test revealed the level of radon in the basement had fallen to 69 bq/m³, well below the guideline maximum level of 200 bq/m³, and the basement was left waterproof and free from the risk of condensation forming.

For further information on the ADD Waterproofing system use the reader enquiry number 188

For further information on ProTen Services use the reader enquiry number 189