GOOD REPAIR GUIDE GRG 37/1

RADON SOLUTIONS IN HOMES

Improving underfloor ventilation

Chris Scivyer

This Good Repair Guide offers guidance to builders and homeowners carrying out installation works to increase ventilation under suspended ground floors. It covers the installation of both natural and mechanical (fan-assisted) ventilation to underfloor spaces. Advice is also given on system maintenance and what to do if a system fails to adequately reduce radon levels.

This Good Repair Guide is Part 1 in a 3-Part set and replaces the guidance given in BRE Report BR 270. Parts 2 and 3 cover positive house ventilation and sump systems.

BACKGROUND

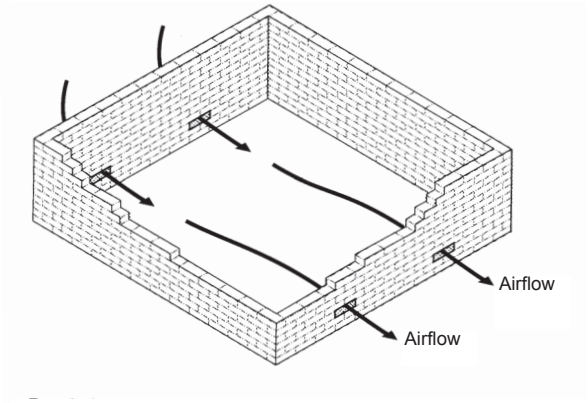
Radon

Radon is a naturally occurring radioactive gas that is present in all buildings. Prolonged exposure to high levels causes lung cancer The Health Protection Agency (HPA) recommends that householders with concentrations above the action level (200 Bq m^{-3}) should reduce their radon concentrations as far as they can and ideally to below the target level (100 Bq m^{-3}).

Improving underfloor ventilation

If part, or all, of the ground floor is of suspended timber construction, improving underfloor ventilation may be an appropriate method for reducing indoor radon levels. Suspended timber floors should be well ventilated to reduce the risk of timber rot and musty smells. Ideally, there should be vents in the walls on either side of the floor to encourage cross-ventilation and minimise dead areas beneath the floor (Figure 1). Improving underfloor ventilation to reduce radon levels therefore also benefits the floor in other ways.

Locating airbricks on the opposite sides of the underfloor space allows for complete cross ventilation



Poorly located airbricks cause areas of poor ventilation (dead areas)

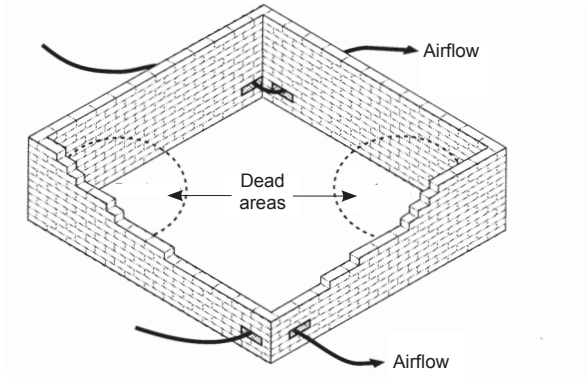


Figure 1: Examples of (a) good ventilation (b) poor ventilation

Improved natural underfloor ventilation is generally effective for radon levels up to 500 Bq m^{-3}. It may be effective with higher levels but if not an underfloor fan could be added later. Often with higher levels, mechanical underfloor ventilation (using a fan) or an alternative solution will be required.

GOOD REPAIR GUIDE GRG 37 Part 2

RADON SOLUTIONS IN HOMES

Positive house ventilation

Chris Scivyer

This Good Repair Guide offers guidance to builders and homeowners installing positive ventilation systems in homes. When controlled ventilation is provided to a house, indoor radon levels can be reduced and at the same time the indoor environment can be improved by reducing condensation, mould, stuffiness and stale odours. Advice is also given on system maintenance and what to do if a system fails to adequately reduce radon levels.

This Good Repair Guide is Part 2 in a 3-Part set and replaces the guidance given in BRE Report BR 281. Part 1 covers underfloor ventilation and Part 3 covers radon sump systems.

Figure 1: Roof-located positive ventilation system

Figure 2: Wall-mounted positive ventilation system

BACKGROUND

Radon

Radon is a naturally occurring radioactive gas that is present in all buildings. Prolonged exposure to high levels causes lung cancer. The Health Protection Agency (HPA) recommends that householders with concentrations above the action level (200 Bq m^{-3}) should reduce their radon concentrations as far as they can and ideally to below the target level (100 Bq m^{-3}).

What is positive ventilation?

Positive ventilation systems blow fresh filtered air into a property. Most systems comprise a fan unit located in the roof space (Figure 1). The air usually enters through a diffuser in the ceiling of the hallway or at the top of a stairway. The fan units should run continuously to effectively reduce radon concentrations. For properties without a roof space, such as flats and apartments, wall-mounted units are available (Figure 2).

Where can positive ventilation systems be used?

Positive ventilation systems are one of the least disruptive radon remedial measures to install. The systems are likely to work best:

GOOD REPAIR GUIDE GRG 37 Part 3

RADON SOLUTIONS IN HOMES

Radon sump systems

Chris Scivyer

This Good Repair Guide offers guidance to builders and homeowners installing radon sump systems in homes. It covers the installation of both active (fan-assisted) and passive sump systems. Advice is also given on system maintenance and what to do if the system fails to adequately reduce radon levels.

This Good Repair Guide is Part 3 in a 3-Part set and replaces the guidance given in BRE Report BR 227. Part 1 covers underfloor ventilation and Part 2 covers positive house ventilation.

This guide is split into three sections:

- introduction to radon and sump systems
- guidance on installing sump systems, including worksheets
- maintaining systems and what to do if a sump system does not reduce radon levels sufficiently.

BACKGROUND

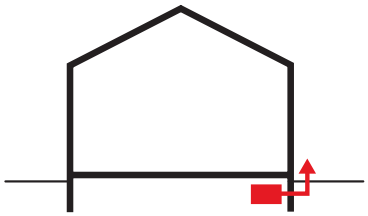
Radon

Radon is a naturally occurring radioactive gas that is present in all buildings. Prolonged exposure to high levels causes lung cancer. The Health Protection Agency (HPA) recommends that householders with concentrations above the action level (200 Bq m^{-3}) should reduce their radon concentrations as far as they can and ideally to below the target level (100 Bq m^{-3}).

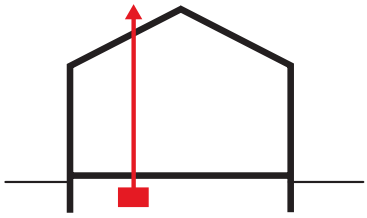
Where can sump systems be used?

These systems can be used on any building where:

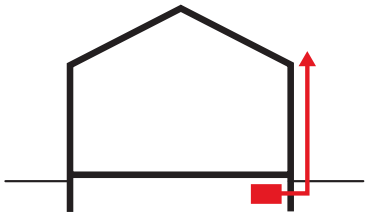
- there is a capping over the ground, such as a concrete groundbearing slab
- there is concrete capping to the soil beneath a suspended timber floor
- a standby sump was provided during construction (in newer homes); see pages 2 and 6.



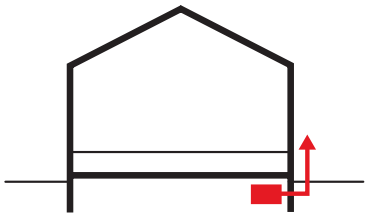
Externally constructed sump with low-level exhaust



Internally constructed sump with high-level exhaust



Externally constructed sump with high-level exhaust



Externally constructed sump with low-level exhaust to a timber floor with concrete capping to the soil below

Figure 1: Generic sump systems