



Reducing Radon

Quick Guide 7

Underground rooms – cellars and basements

Radon levels may be higher in homes with underground rooms due to the greater area of floor and wall in contact with the ground. This leaflet provides guidance for reducing radon in homes with rooms either fully or partially below ground (eg cellars and basements, or stepped construction where the property is built into a slope or hill). These rooms are often used as a living space or for storage. The flowchart (Figure 1) will help you choose the most suitable method of remediation.

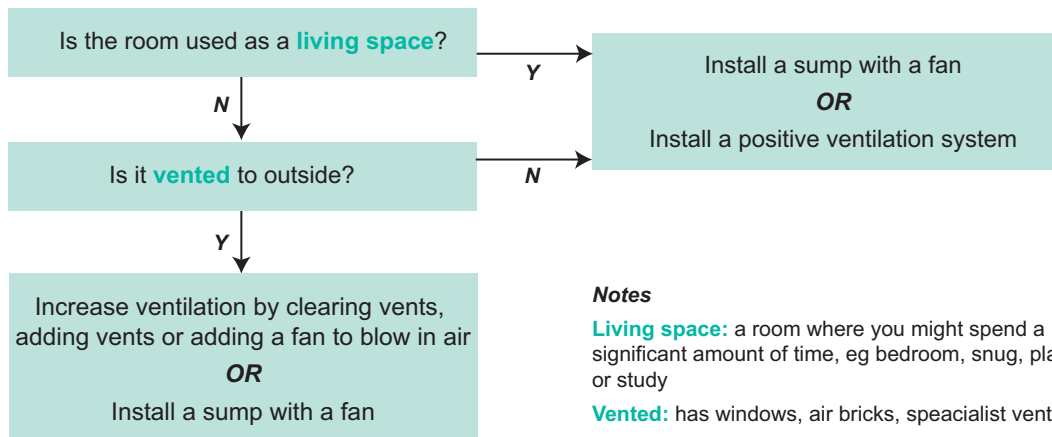


Figure 1 Flowchart to choose a suitable remedy (www.ukradon.org/information/tree-cellar)

Increasing natural ventilation

Increasing natural ventilation by installing vents in outside walls can help to reduce radon levels. Consider periscopic vents when the room is below ground level (Figure 2).

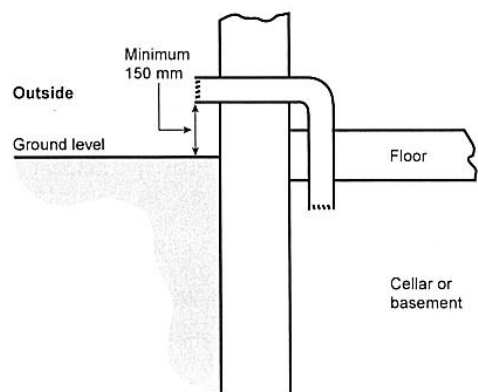


Figure 2 Air ducted from above ground

Positive ventilation (see Quick Guide 3)

Whole-house positive ventilation systems fitted in the loft are suitable for typical two-storey houses. You may require a larger unit if you have an underground room – check with the manufacturer.

You could consider a system for the underground room alone or, as an additional system to the whole house, a positive ventilation system in the loft.

Ventilation can be applied to an underground room using an electric fan blowing air in from outside (Figure 3). The effectiveness will be increased if entrances into the underground room are sealed.

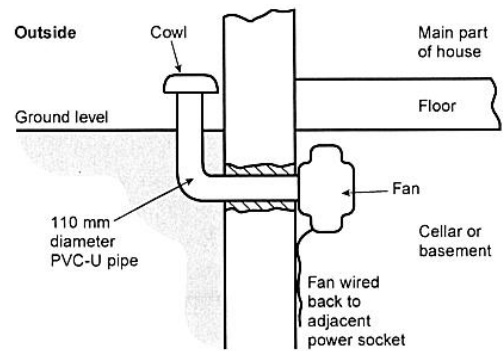


Figure 3 Fan blowing in air

Extracting air from an underground room

This is often effective at reducing radon levels in the rest of the house but the radon level in the underground room could be significantly increased. It is worth measuring the radon level in the room to determine the significance in terms of regular occupancy. If necessary, consider reversing the fan to positively ventilate instead.

Sump system

(see *Quick Guides 4, 5 and 6*)

A sump system can be installed within an underground room to draw radon from beneath a concrete or membrane sealed floor, or from beneath the floor and the adjacent ground floors of the house (Figure 4). Consider noise from the fan and pipe work when positioning the sump: insulation around the fan will reduce noise. You may need a specialist contractor to advise on the position of the sump

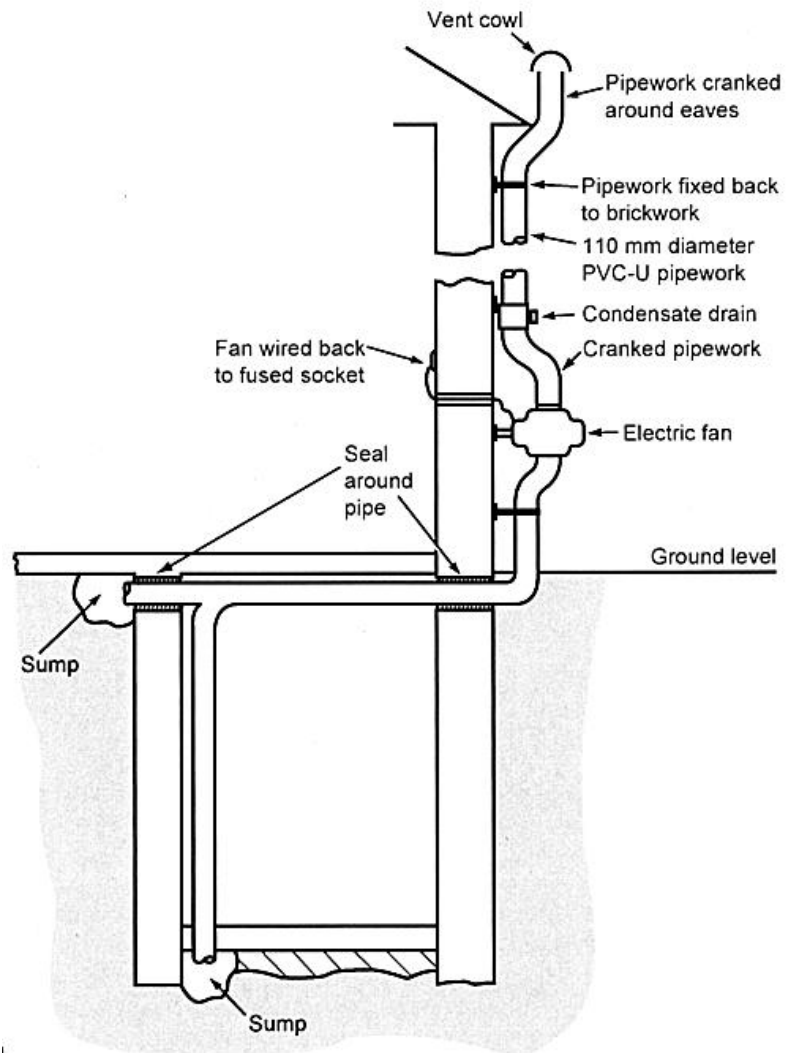


Figure 4 Sump system with high level exhaust, drawing radon from beneath a basement and the adjacent ground floor

Supplementary notes

- isolate unused underground rooms from the rest of the building by sealing around doors and other access points to the main house, with a draught excluder, rubber seal, etc

- ventilate any other under-floor voids. Consider increasing the ventilation beneath any suspended timber ground floors by clearing, replacing with more open plastic airbricks or adding more airbricks to reduce radon levels (**see also Quick Guide 1**). The underground room would require separate treatment: see above
- sealing walls and floors in an underground room is unlikely to significantly reduce radon levels
- If the space beneath a home contains a garage, it is likely that the garage has a well constructed floor and good ventilation. If a room is adjacent to the garage, ventilation could be improved in the room and/or a sump system could be installed within the garage to reduce radon levels
- consider using a specialist radon contractor

REMEMBER

Do a follow-up RADON TEST to check radon levels are reduced sufficiently.

More detailed guidance on cellars and basements is available in

BRE Report BR343: A BRE guide to radon remedial measures in existing dwellings: dwellings with cellars and basements, which can be purchased from www.brebookshop.com.

Disclaimer

This information sheet has been produced by BRE and PHE. It should be noted that BRE and PHE cannot guarantee that the measures described on this sheet will reduce the radon level in your home; however, similar measures have regularly proven successful elsewhere in the UK.

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