

Preventative/Protective Radon measures for 'New Builds'

A UK Perspective: This presentation summarises the BR211 guidance document (BRE, 2023), using examples from that publication

Understanding how UK Regs have reduced radon levels in new buildings could aid a 'fast track' route to providing a good level of protection in buildings in Portugal

March 2024

Jerry Board, Director, UK Radon Ltd



BR211 UK Building Regulation Guidance 2023



Published by the Building
Research Establishment

Only available on-line, not a
printed document

Levels of Radon Concentrations; defining categories

- **Basic Radon protection**
Areas with <10% risk
- **Full Radon Protection**
areas with >10% risk

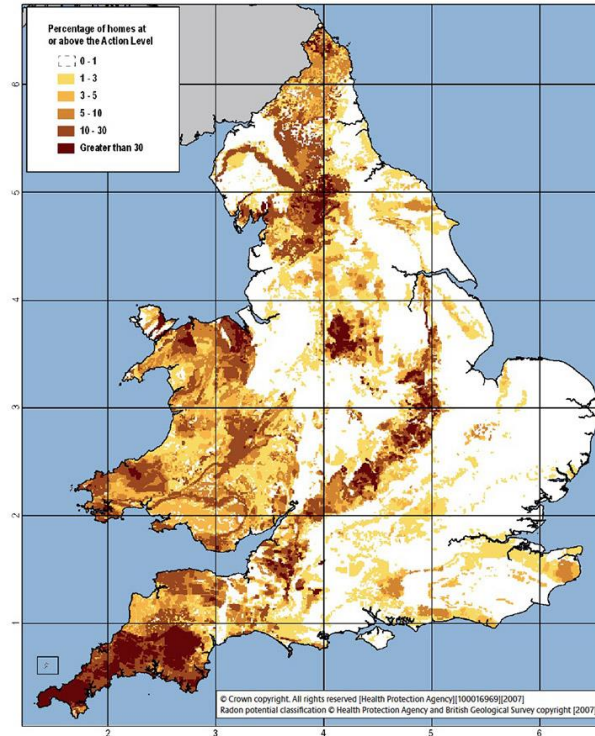
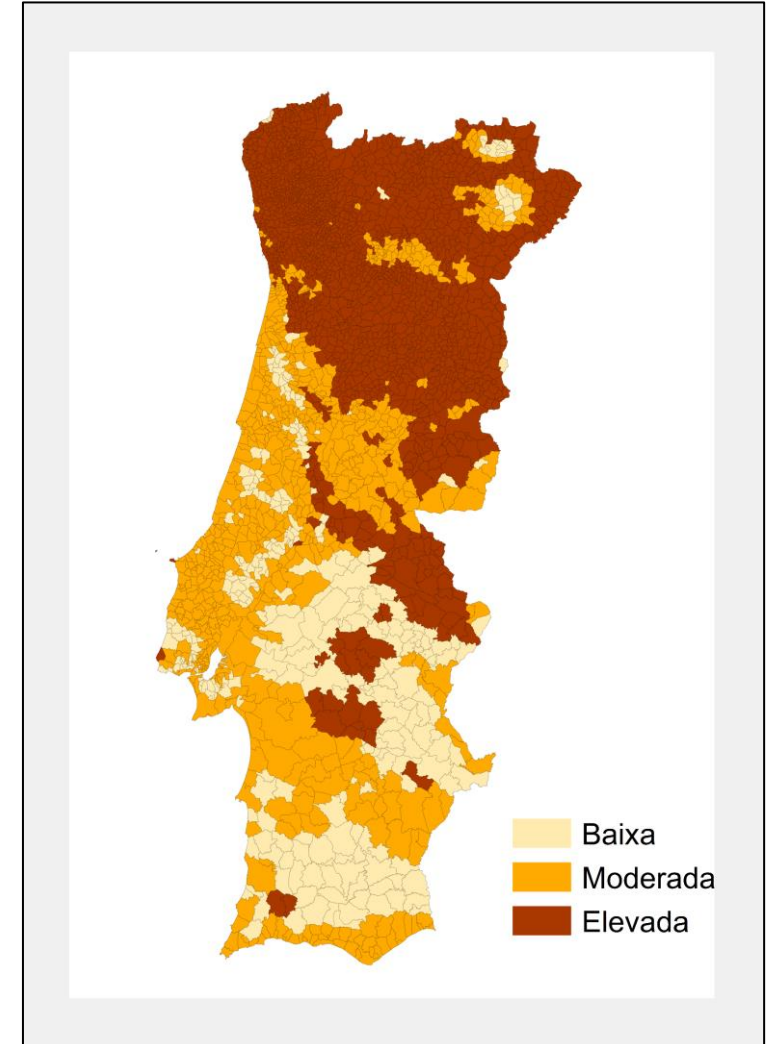


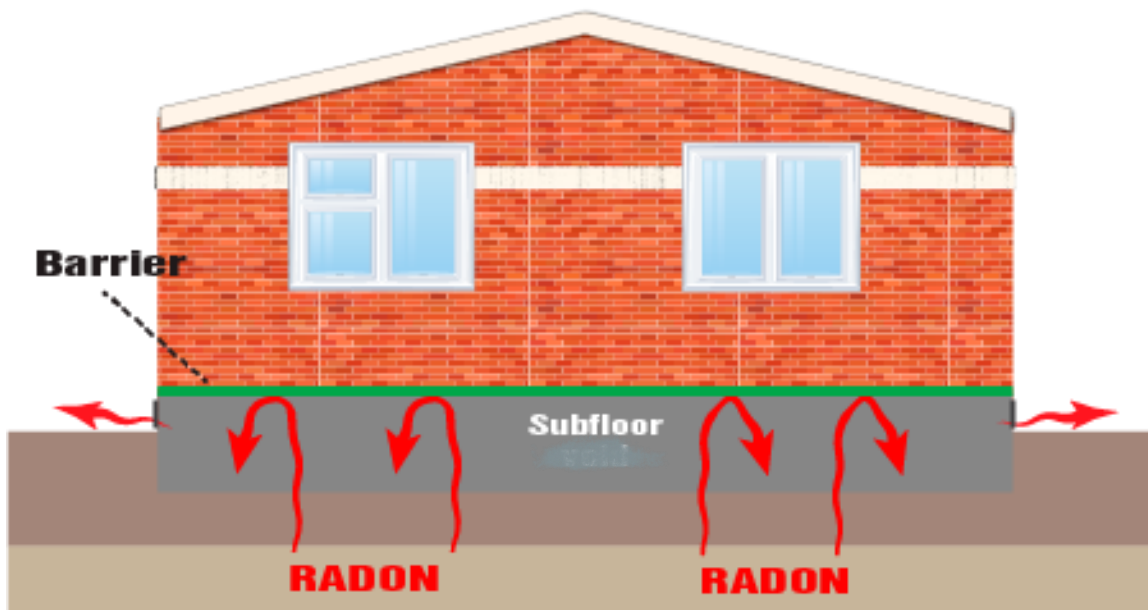
FIGURE 2 Overall map of radon Affected Areas in England and Wales (axis numbers are the 100-km coordinates of the national grid)



Basic Radon protection (areas with <10% risk)

Solid Floors

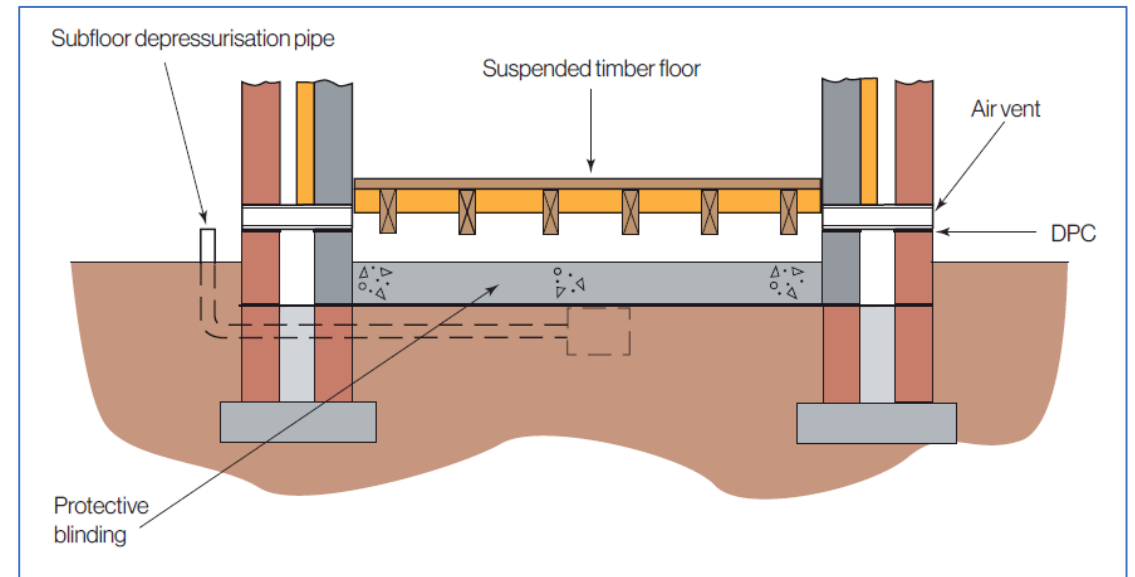
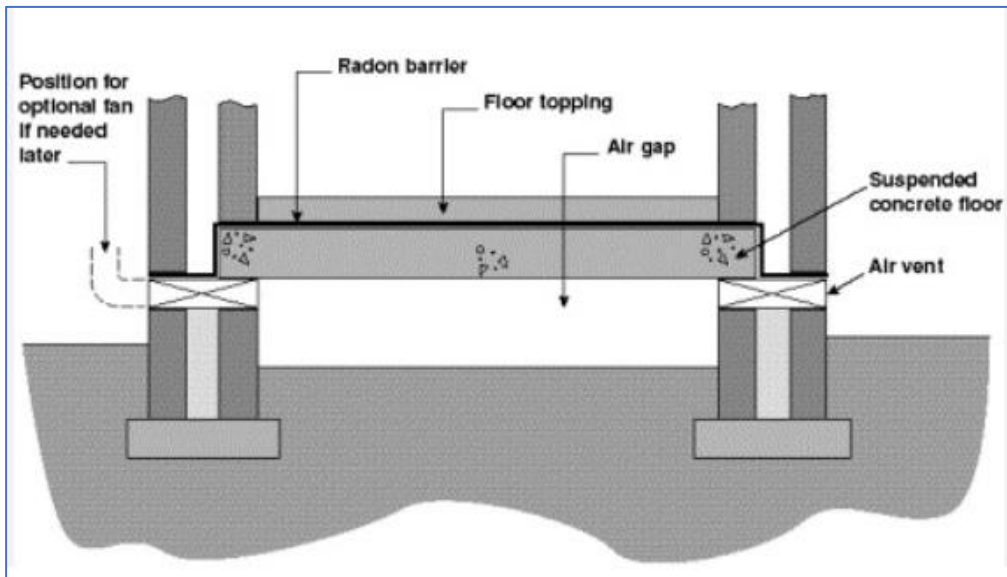
- A barrier across the footprint of the building (400 microns thick)



Basic Radon protection (areas with <10% risk)

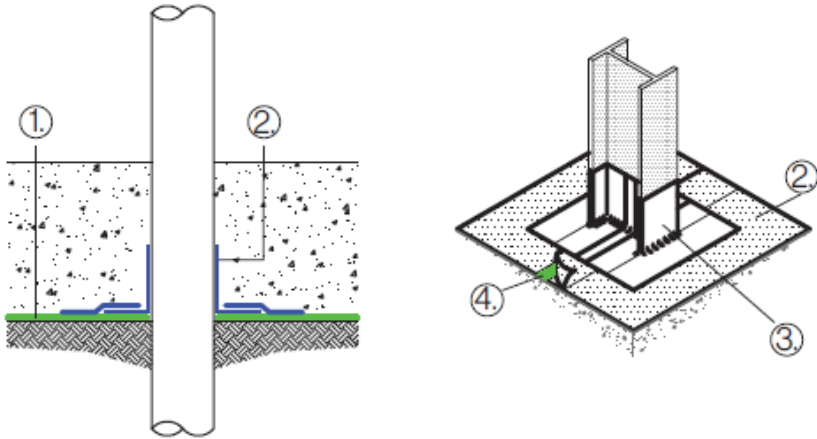
Suspended Floors

- A barrier across the footprint of the building (400 microns thick)
- Adequate air bricks around the building



Details

- Seal around all protrusions through the membrane



- Seal across any cavity to the outside of the building



Full Radon Protection

(areas with >10% risk)

Solid Floors

- Fit a precautionary sump

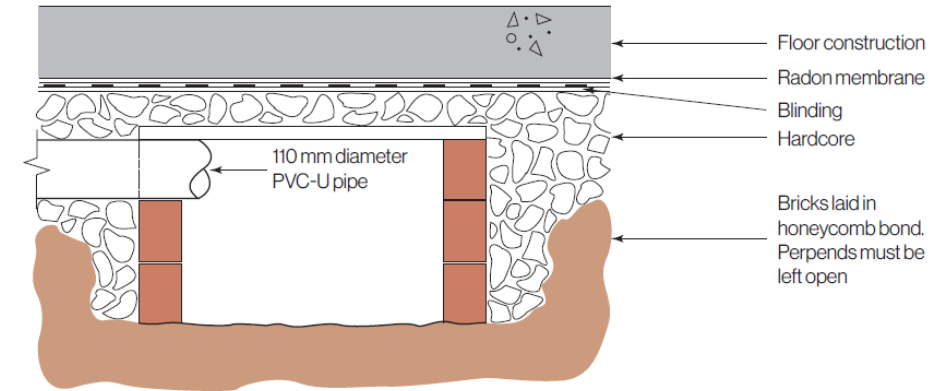


Figure 30: Radon sump details

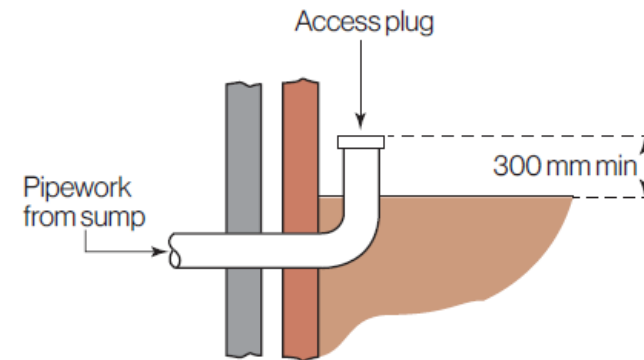


Figure 31: Pipework from sump is capped off with an access plug just above ground level

Full Radon Protection

Suspended Floors

- Provide adequate under-floor ventilation

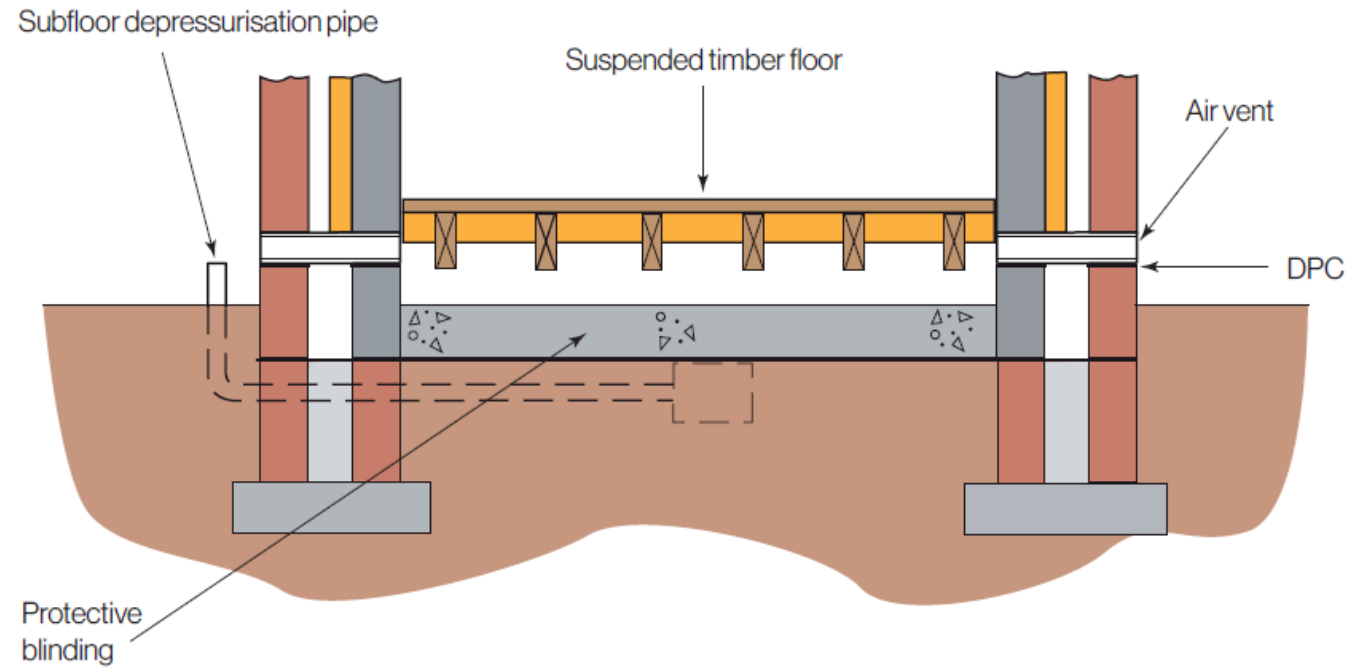


Figure 20: Full radon protection to a suspended timber floor with the barrier laid under the blinding and extended out through the walls

Protective measures against Radon Ingress – BR211 guidance

- **Basic protection** (lower Radon levels) – fit a barrier under the floor extending to the outside of the building. Ensure adequate cross-flow of air under suspended floors
- **Full Protection** (High Radon levels) – fit a precautionary sump and ensure that active sub-floor ventilation can be supplied under suspended floors
- **Detail** – ensure the barrier is complete, especially where protrusions are made, and when crossing cavities

Protective Radon measures; some caveats

- For basic protection, barriers significantly reduce radon coming into a building, but do not stop radon completely
- You must ensure the barrier does not get broken during construction, as this can reduce effectiveness
- You may still need active radon remediation after construction, if radon monitoring shows the property remains above the action level.
- In earthquake zones the barrier can only be sealed to the edges of pillars, so cannot cover the whole footprint of the building

Protective Radon measures in Portugal

Barriers

Should barriers be fitted under all properties?

Can sealing inside the outer structure be effective?

Precautionary Sumps

Could passive/active sumps be used without a barrier?

Airflow

Should this be the most important component for suspended floored houses?