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# Radon – a Building Control Perspective

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**Gerald M Coulter**

**Building Standards Branch**

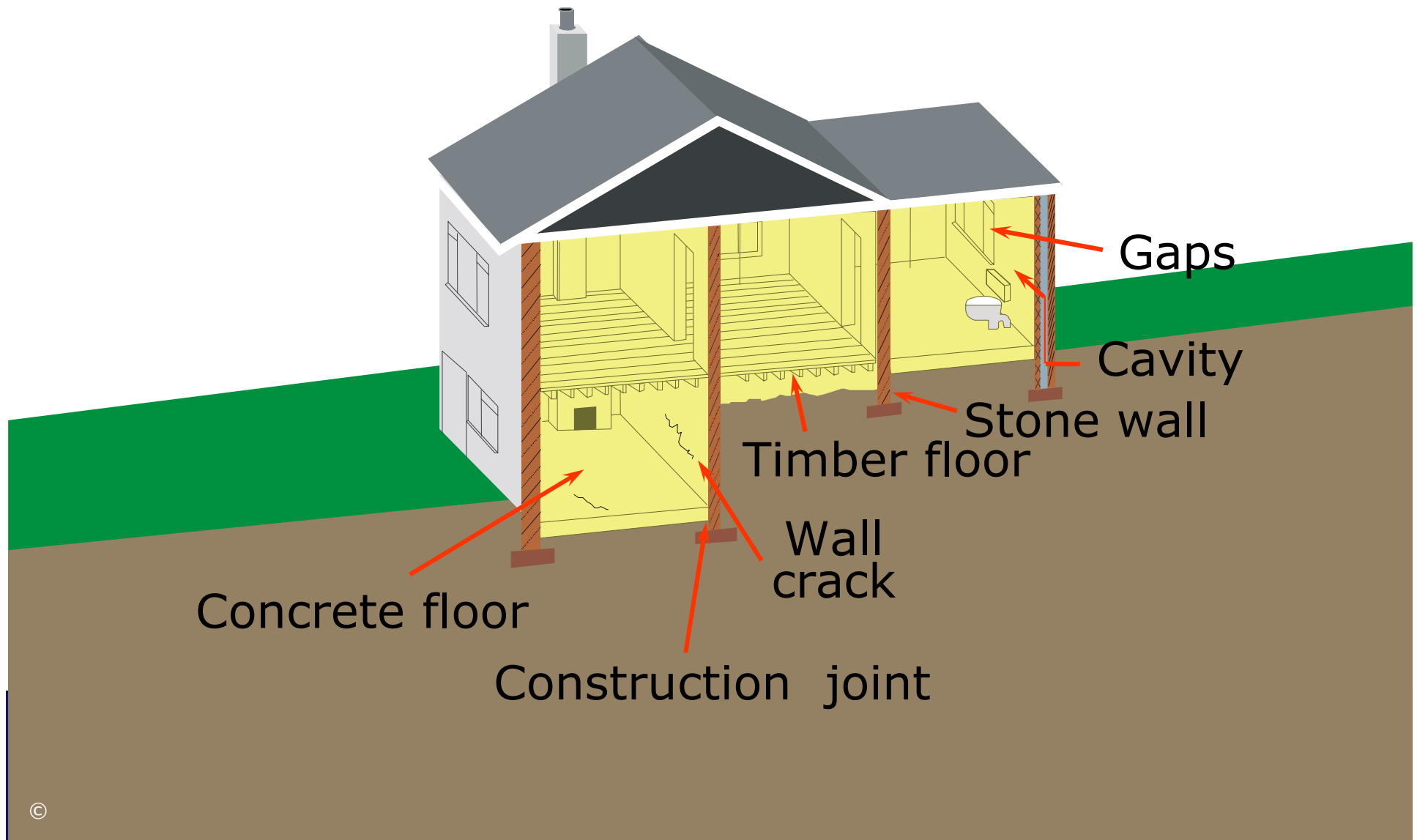
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# Possible Routes of Radon Ingress from the Ground



## C1 Application and interpretation

- (1) Regulation C2(2) shall not apply in relation to an existing **dwelling** or part of an existing **dwelling** -
  - (a) which is altered; or
  - (b) which is extended by less than 30 m<sup>2</sup>.

**DANGEROUS AND HARMFUL SUBSTANCES** includes any substance which is or could become corrosive, explosive, inflammable, **radioactive**, or toxic and includes deposits of faecal or animal matter.



## C2 Preparation of site and resistance to dangerous and harmful substances

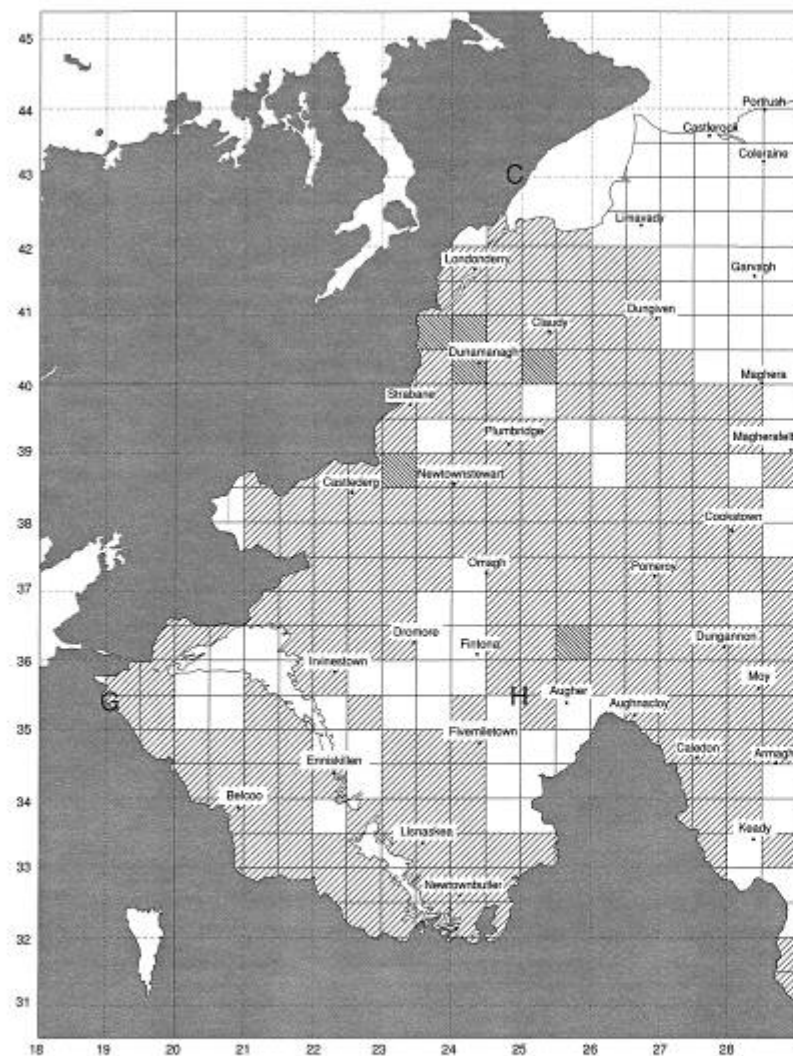
(1) The site of the **building** and the ground adjacent to it shall be prepared and treated, and measures shall be taken, so as to prevent, as far as reasonably practicable, any harmful effect on the **building** or the health and safety of the occupants caused by –

(a) vegetable soil; and

(b) dangerous and harmful substances.

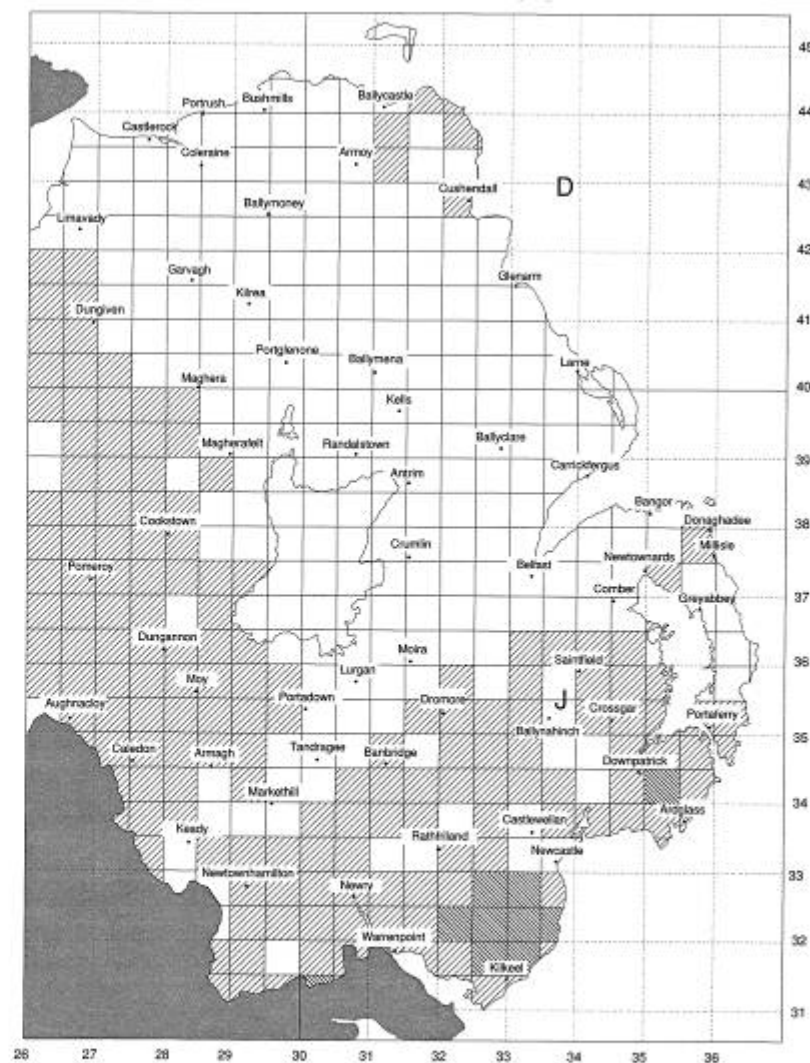
(2) Without prejudice to the generality of paragraph (1) measures shall be taken to prevent or limit the ingress of radon from the ground into any **dwelling** situated in a zone marked **on the map set out in Schedule 3**.





Map 1 Areas where Zone 1 (lighter shading) and Zone 2 (darker shading) radon protection measures must be provided

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Map 2 Areas where Zone 1 (lighter shading) and Zone 2 (darker shading) radon protection measures must be provided

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## ***C6 Deemed-to-satisfy provisions for regulations C2(2), C4 and C5***

- (1) The requirements of regulation C2(2) shall be deemed to be satisfied, in the case of a building specified in column (2) of Table C opposite the reference to that regulation, if the measures to prevent or limit the ingress of radon into the building are in accordance with the relevant provisions of the publications or measures specified opposite thereto in column (3), as amended by the publications specified opposite thereto in column (4)***



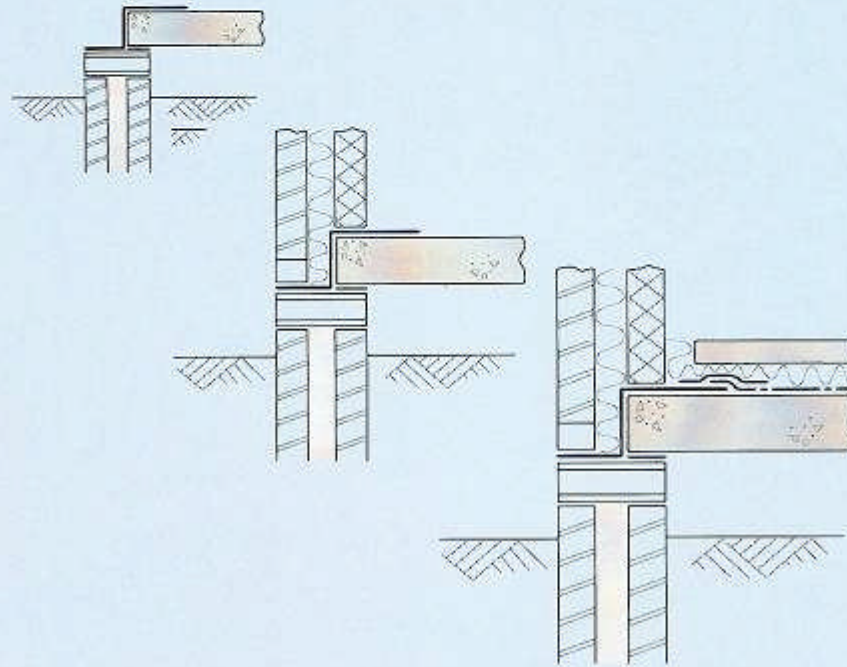
## Table C

### *(Preparation of site and resistance to moisture)*

Regulations (1)	Buildings (2)	Publications or Measures (3)	Amendments (4)
C2(2) Preparation of site and resistance to dangerous and harmful substances	Alteration or extension to a dwelling	The same measures as are incorporated in the existing dwelling	—
	A dwelling	BRE Report BR 413	—



# Radon: guidance on protective measures for new dwellings in Northern Ireland

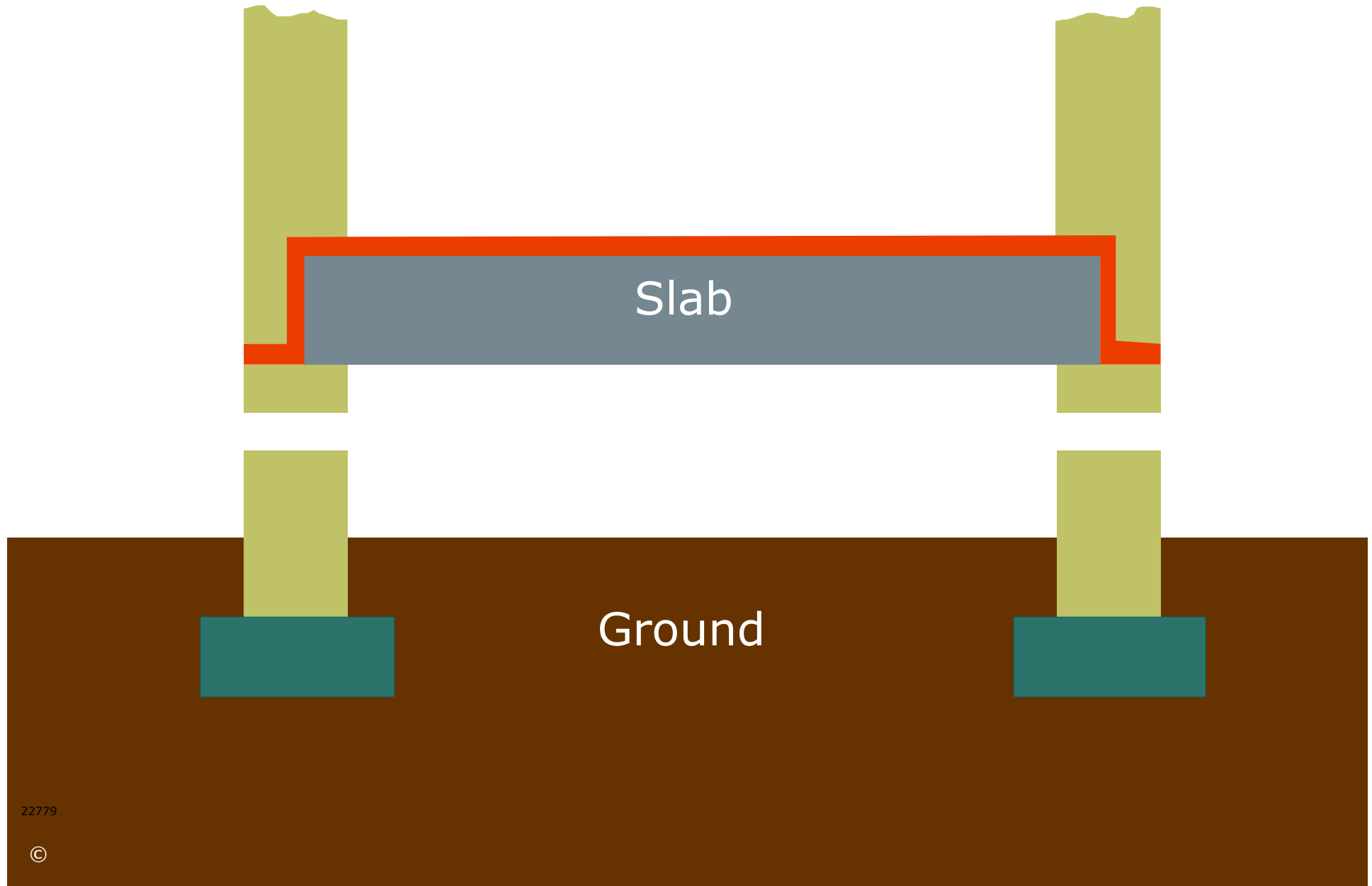


**Zone 1 – 1% to 10% probability** of radon concentration exceeding 200 becquerels per cubic metre

**A radon membrane over the footprint of the building**



# Anti-radon Design

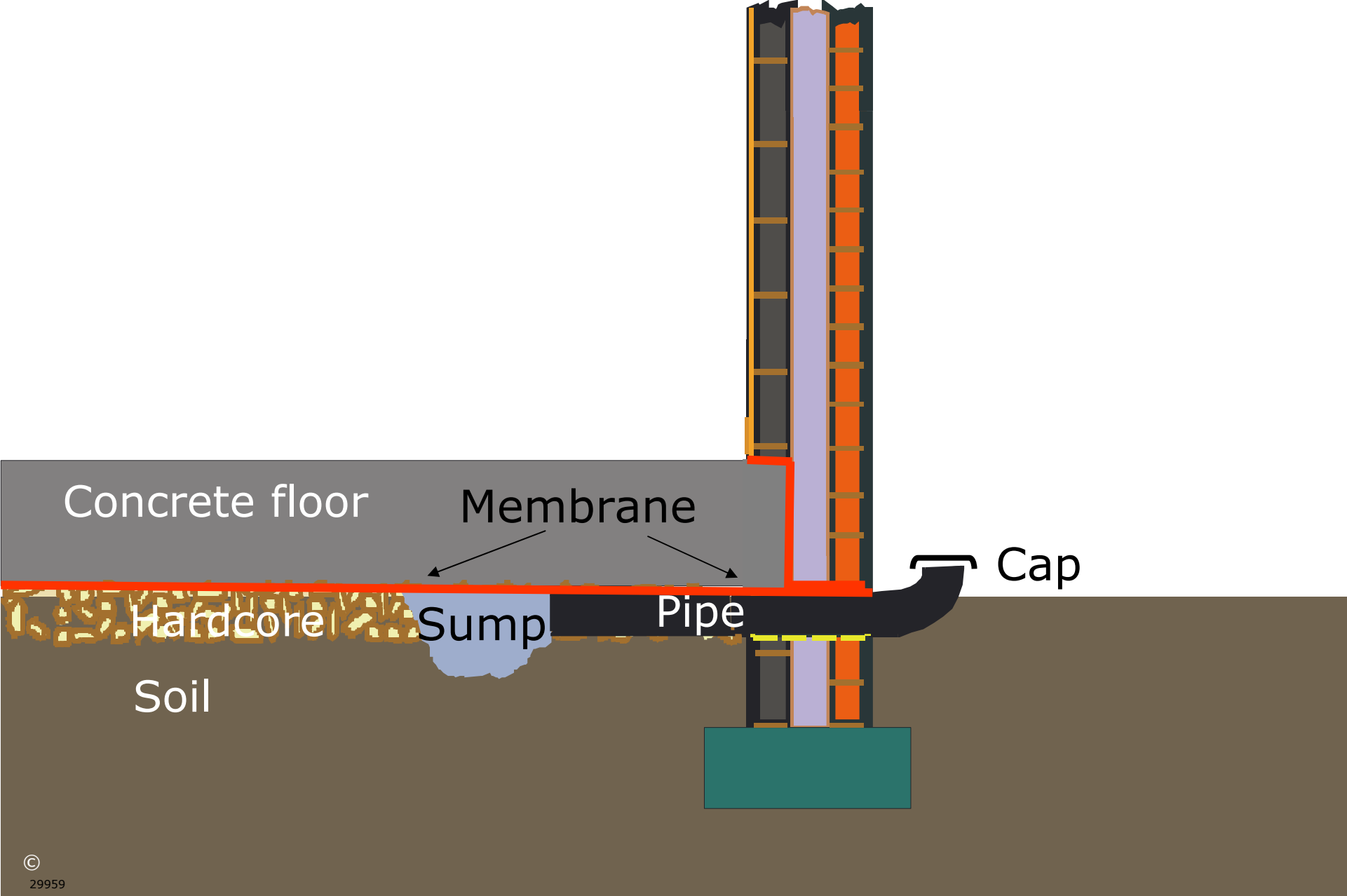


**Zone 2 – Greater than 10% probability of radon concentration exceeding 200 becquerels per cubic metre**

**A radon membrane over the footprint of the building and a radon sump and stub duct**



# Anti radon design



## Practical problems

- Sealing joints in the membrane (Gas tight)
- Sealing around service penetrations
- Protecting against punctures in the membrane
- Sealing membrane to cavity trays
- Slip planes
- Continuity at internal walls



## Practical problems

- Air supply to combustion appliances
- High water table affecting sumps
- Integral garages with occupied rooms above
- Stepped foundations
- Adequate underfloor ventilation
- Settlement (esp ground bearing slabs)





## **A3 Deemed-to-satisfy provisions**

**(1) Where any provision (in these regulations called a deemed-to-satisfy provision) states the use of a particular material, method of construction or specification shall be deemed to satisfy the requirement of any regulation or part thereof, that provision shall not be construed so as to require any person necessarily to use such material, method of construction or specification.**



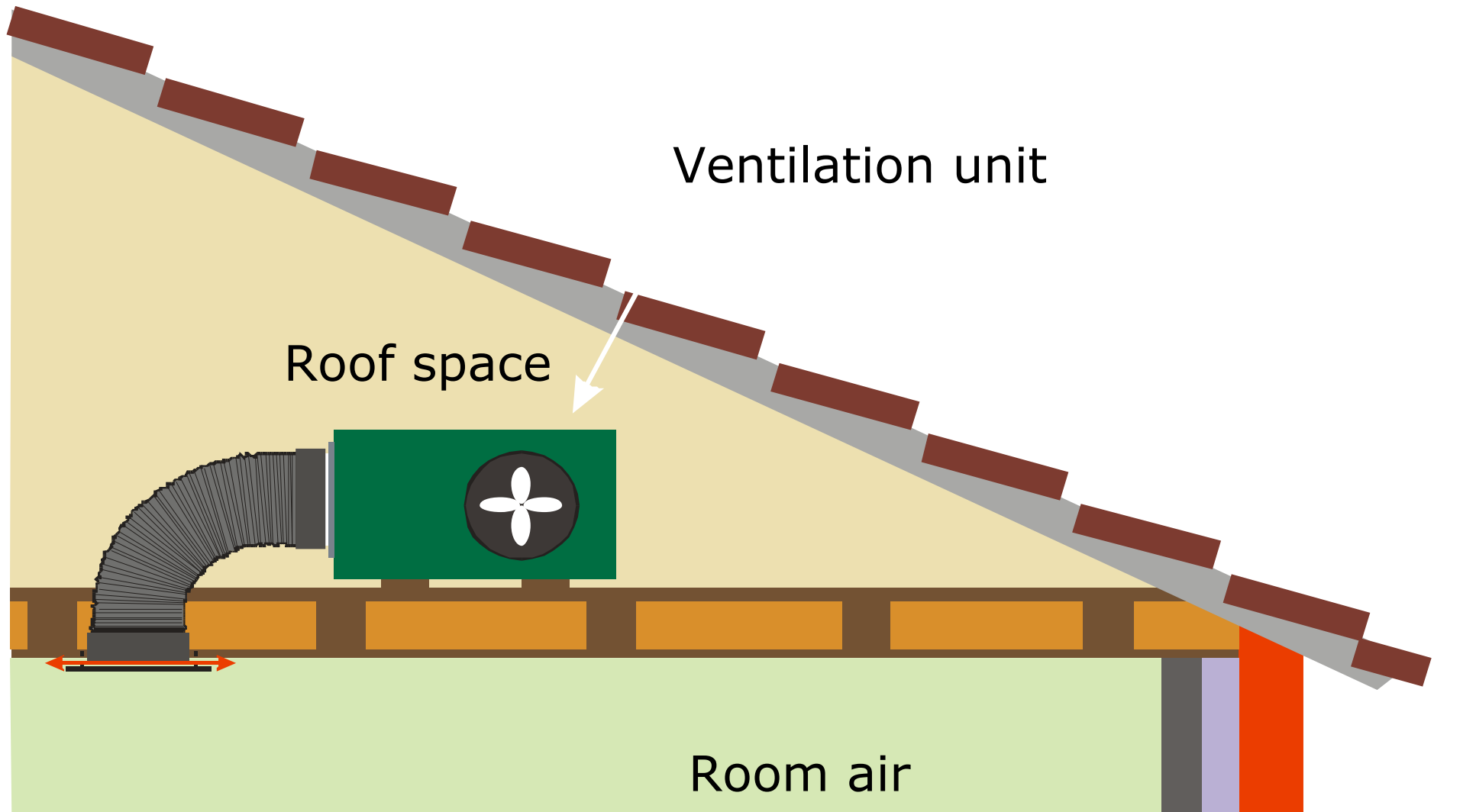
**So you do not have to follow the deemed-to-satisfy provisions!**

**Propose alternative radon strategies to Building Control to either –**

- (1) prevent radon ingress to living areas; or**
- (2) dilute the radon.**



# Ventilation Fan in Loft



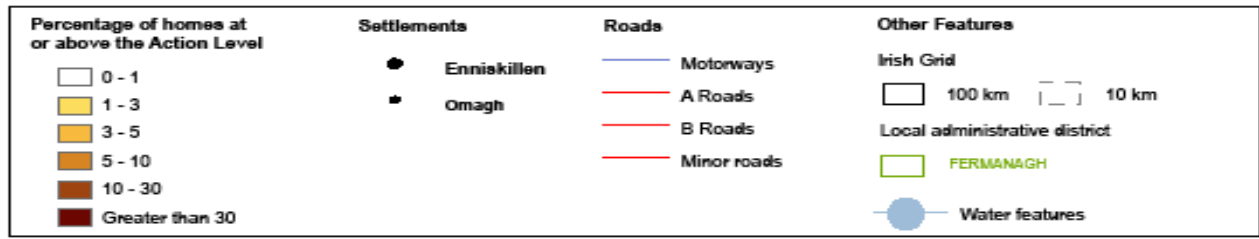
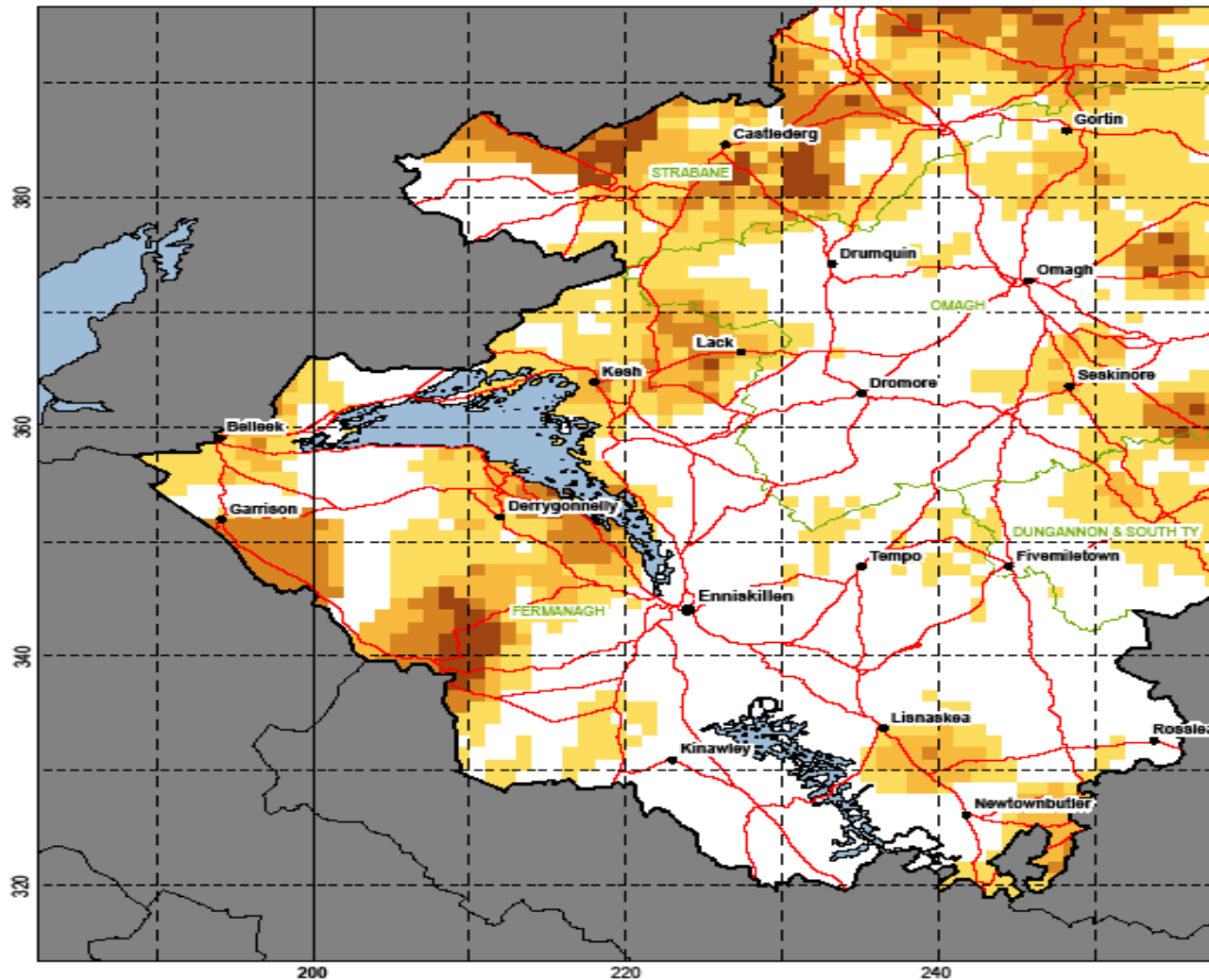
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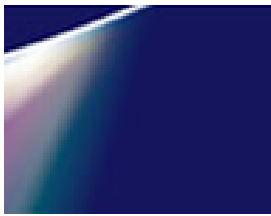


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Map 1 Southwest Northern Ireland (axis numbers are the coordinates of the Irish Grid)

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**As with measures to limit climate change the problem is not with new dwellings as they will (where necessary) have radon protection to comply with the building regulations.**

**The problem is how to get householders to get existing homes tested and to encourage them to undertake radon remedial measures where necessary.**

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# Thank you

**Gerald M Coulter MRICS MBEng**

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