Strategy Proposals for Radon prevention in new buildings

Radon Forum
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Presentation Overview

1. Current Building Regulation requirements
2. Current issues causing problems
3. Radon Strategy proposals for:
   • Training
   • Improved Prevention methods
   • Certification
Building Regs - Requirements

- Part A - Structure
- Part B - Fire Safety
- Part C - Site preparation and moisture resistance
- Part D - Materials/workmanship
- Part E - Sound
- Part F - Ventilation
- Part G - Hygiene
- Part H - Drainage, waste water disposal
- Part J - Heat producing appliances
- Part K - Stairways, Ladders, ramps & guards
- Part L - Conservation of fuel & energy
- Part M - Access for disabled people
Building Regulation C & TGD C
Site Preparation and Resistance to Moisture

• C3  Reasonable precautions shall be taken to avoid danger to health and safety caused by substances (including contaminants) found on or in the ground to be covered by a building.

• “contaminant” includes any substance which is or could become flammable, explosive, corrosive, toxic or radioactive and any deposits of faecal or animal matter;

• Section 2 addresses Radon for designated High and Low areas.
Radon map
Standby Radon Sump

- Design, location and frequency (influence area at least 250m²)
- No obstructions
- Pipework connecting sumps should terminate outside the external walls of the building or in the attic space.
- Pipes should be capped and external pipes should be sealed to prevent ingress of rainwater or rodents
- Clearly identified as potential outlets for Radon Gas
  - Marker plate
  - Pipe cap incorporating raised lettering
Radon Sump with capped extraction pipe.
Activated standby sump

Future System Activation Kit (if required)

Radon pipe cover opened and extended for extraction

Extend pipework using standard pipe brackets

Terminal Unit

Fan
High Radon Areas

- a fully sealed membrane of low permeability over the entire footprint of the building
- a potential means of extracting Radon from the substructure such as a standby Radon sump
A Radon Barrier is NO guarantee of a Low radon level in the finished dwelling.

TGD C recommends a post occupation test so that the Radon Sump can be activated if necessary.

A Radon Barrier contributes significantly to reducing the overall Radon concentrations.

The reduction appears to be inline with other EU countries using Barriers.
Radon Barrier with pipe penetration

The Barrier must be:
- In accordance with Part D of the Building Regulations
- Materials and Workmanship (& TGD D)
- Independent Certification by an approved body eg NSAI Irish Agrément Board (IAB)

• Proper installation by trained personnel, attention to detail, and post – installation protection
Radon Barrier installation

- Radon Barrier extending to the outside leaf.
- All pipe penetrations sealed.
Issues

- Poor installation or positioning of sumps:
  - Pipe sloping downwards and water accumulating in the pipe resulting in a water trap
  - Outlet positioned under or in front of obstacles or obes
Poor design and positioning
Issues (cont.)

• Barriers poorly installed especially at corners & around penetrations

• Post installation damage
  – By services
  – By power floating
  – By workmen
Post installation damage
Proposed Information & Training

- M.1 Short targeted training courses should be provided for site staff on the correct installation of radon preventive measures and on maintaining the integrity of those measures once installed.

- The aim of this would be to:
  - Explain the dangers of Radon
  - The purpose of the standby sump
  - The necessity of maintaining the barrier intact

This course to be done through industry groups such as the CIF, IHBA and/or Homebond.
Proposed Information & Training

• M.2 Basic information on radon should be included on undergraduate courses related to the construction industry
  – Currently the 3rd level training appears to deal with barriers as part of the DPM for buildings without any emphasises on the dangers or reasoning behind the requirements.
  – National reference levels etc

• M.3 In cooperation with the relevant professional bodies education on radon should be integrated into the existing system of continuous professional development (CPD) for building professionals.
  – The aim here to increase the expertise of the construction professional both for prevention and resultant remediation
  – Explain other remediation methods
  – Design methods to reduce the risk of damage to barriers
Proposed Information & Training

• M.4 A web based knowledge resource on radon should be developed for the building industry

• The aim is to have available:
  – Information on the dangers
  – methods of prevention and remediation
  – FAQ’s for the homeowner and the professional.
Proposed TGD Changes

• M.5 The relevant Technical Guidance should be amended to require that a passive sump be installed in all new dwellings
  – There is increased evidence that a passive sump reduces radon by 50% or more
  – Little added cost to the current sump requirements
  – Aids the proper positioning and installation.

• M.6 The relevant Technical Guidance should be amended to include provisions, which would allow radon preventive measures to be more easily identified on site
Passive Radon Sump

Pipe continues from Radon Sump to external air.
Pipe vents above the roof to:
- Give passive extraction
- Disperse gas to air.
Pipe readily identifiable to prevent errors and misuse.
Very small capital cost.
Large reduction in Radon infiltration
Easy connection of Fan for future remediation.
Typical Radon vent pipe
Proposed Research

• M.7 The current requirement that barriers are required in High Radon Areas should stand. Research should be carried out to assess the combined effectiveness of passive sumps and barriers compared to the effectiveness of barriers alone.

• M.8 Research on better barrier systems and the appropriate placing of barriers to improve barrier success rate and decrease post-installation damage should be undertaken.
The building control process should be amended to require specific “sign off” by a competent person regarding the installation of radon preventive measures. It is noted that the proposed Building Control (Amendment) Regulations 2012, will result in new building certification procedures requiring sign off by competent persons on a wide range of measures.
Proposed Building Control Regulations

- Statutory requirement for a registered professional
- Schedule of inspections is agreed with the assigned certifier.
- Assigned Certifier & Builder are responsible for the statutory Certificate.
- Statutory certificate confirms compliance with all the Building Regulation requirements.
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Thank You for your attention.