

Radon Protection of Buildings

Towards a Common European Technical Agenda

- ◆ A coherent, **Harmonized European Action Programme** - initially covering the short term up to the year 2010 ;
- ◆ A multi-lingual, **Harmonized European Vocabulary** dealing with 'radon protection of buildings' ;
- ◆ A reliable, **Harmonized European Database** of 'radon' related statistics - concerted action is required by Eurostat and the national statistical organizations of the E.U. Member States (this will require time and resources) ;
- ◆ **'Person-Centred' Research & Demonstration** which answers the health needs of 'real' people exposed, over prolonged periods of time, to low levels of ionizing radiation and the practical demands of those who plan, design, construct and manage for protection of that health in the European 'built' environment ;
- ◆ A comprehensive array of 'radon' related **Performance Indicators** - this includes **Benchmarking** ;
- ◆ An effective E.U. regime of **Performance Monitoring & Technical Control**.

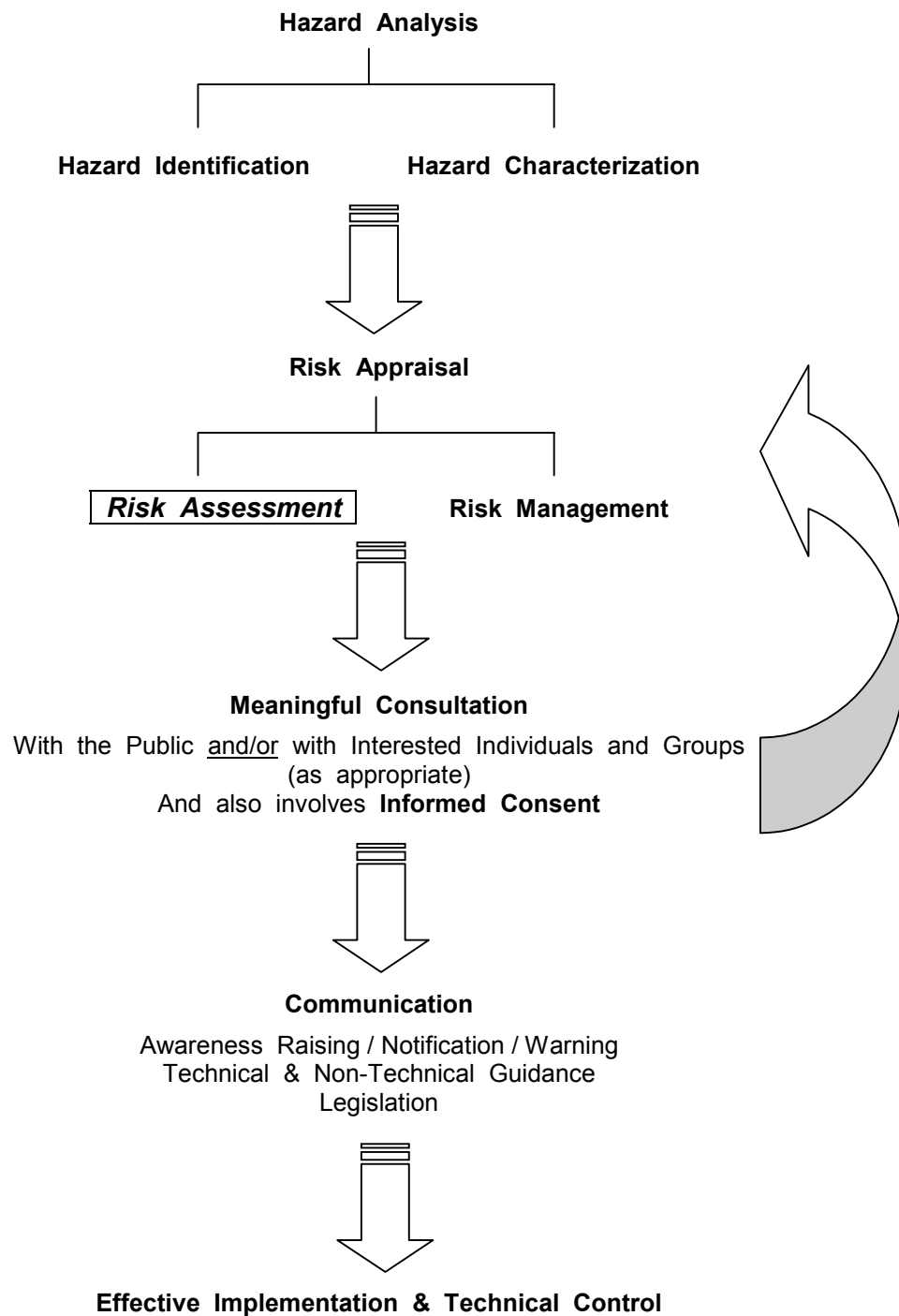
Radon Protection of Buildings

Harmonized European Action Programme

- ◆ **Widely Multi-Disciplinary Approach** is essential ;
- ◆ **Good European Union Legislation** - implemented well at national / regional / local levels & operated properly :
 - E.U. Objective - high level of health protection ;
 - 'fitness for intended use' of products / systems ;
 - 'competence' - plan, design, construct & manage ;
 - regular testing of buildings (every 5 years) - and upon completion of any major modifications ;
- ◆ **Health Protection & Assessment of Risk to Safety ??**
- ◆ **Meaningful Consultation with Public**
 - Informed Consent** : Consent freely obtained - without threats or improper inducements - after appropriate disclosure to a person (or persons) of relevant, adequate and easily assimilated information in a form, e.g. oral, written, braille, and language understood by that person (those persons)' ;*
- ◆ **Building Planning, Design & Construction**
 - 'Person-Centred' ;
 - 'Reliability-Based' ;
- ◆ **Effective E.U. Technical Control of Construction & Monitoring of Buildings in Use.**

Radon Protection of Buildings

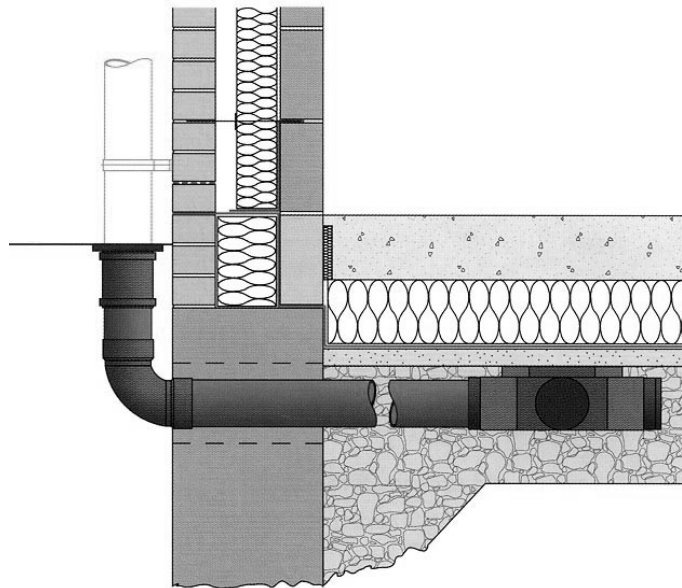
Objective - 'Protection of Health'



Radon Protection of Buildings

Issues of 'Real' Construction

Europe / Non-Seismic Zones



(IAB Certificate 01/0130)

◆ Design Detailing for Building Life Cycle

- reliable radon protection - strategy of 'defence-in-depth' ;
- construction settlement - 50yrs 100yrs 150yrs ;
- thermal performance ;
- accessibility for people with activity limitations.

◆ Radon ~ Emissions, Testing & Measurement

- soils (some may be imported onto site for landscaping) ;
- sub-floor hardcore (imported crushed stone) ;
- building materials (assume no longer local / traditional) ;
- water supplies (especially from deep wells).

- resistance of radon membranes ;
- integrity of installed radon resisting membranes ;

- measure the building - not occupant lifestyle ;
- in vicinity of overhead, high-voltage electrical power lines ?

Radon Protection of Buildings

Categorization of Construction

[General]

1. Category A

- (a) Supervision of the works is exercised by appropriately qualified and experienced personnel from the principal construction organization ;
- (b) Regular inspections, by appropriately qualified and experienced personnel familiar with the design and independent of the construction organization(s), are carried out to verify that the works are being executed in accordance with the design.

2. Category B

Supervision of the works is exercised by appropriately qualified and experienced personnel from the principal construction organization.

3. Category C

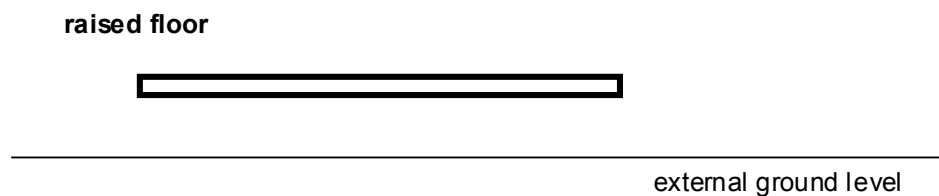
This level of construction execution is assumed when the requirements for **Category A** or **Category B** are not met.

Part 3.3 ~ Irish Agrément Board Certificate No. 01/0130 of 2001
(Easi-Sump & Easi-Sump Cap-Link Radon Soil Gas Control System)

Radon Protection of Buildings

Building Footprint

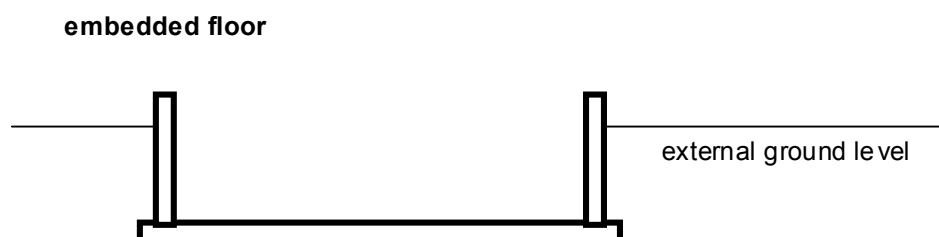
1. Ground Floor Profile I



2. Ground Floor Profile II



3. Ground Floor Profile III



Radon Protection of Buildings

Categorization of Construction

[Radon Resisting Membranes]

1. Category A

- (a) Design of the works is exercised by an independent, appropriately qualified and experienced architect, with design competence relating to radon protection of buildings ;
- (b) Installation / fitting of radon-related construction products / systems is exercised by appropriately qualified and experienced personnel, with construction competence relating to radon protection of buildings ;
- (c) Supervision of the works is exercised by appropriately qualified and experienced personnel from the principal construction organization ;
- (d) Regular inspections, by appropriately qualified and experienced personnel familiar with the design, and independent of the construction organization(s), are carried out to verify that the works are being executed in accordance with the design.

2. Category B

- (a) Design of the works is exercised by an independent, appropriately qualified and experienced architect ;
- (b) Installation / fitting of radon-related construction products / systems is exercised by appropriately qualified and experienced personnel ;
- (c) Supervision of the works is exercised by appropriately qualified and experienced personnel from the principal construction organization.

3. Category C

This level of design and construction execution is assumed when the requirements for **Category A** or **Category B** are not met.