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BRE Good Building Guides and Good Repair Guides

A library of information for all construction professionals

Good Building Guides numerical listing

Good Repair Guides numerical listing

All guides classified by subject

Information

BRE Good Building Guides have over more than 20 years built into a substantial resource of concise practical advice - helping you achieve good quality building.

The complementary Good Repair Guides, published from 1996, provide practical help with defect diagnosis, assessment and repair.

Drawing on BRE site experience and research, each series provides clear technical advice, practical solutions and covers a range of subjects.

An **updated** compilation CD ROM comprising over 100 Good Building Guides and nearly 50 Good Repair Guides giving a huge reference library of advice, practical guidance and expertise from BRE.

Good Building Guides give concise guidance on the principles and practicalities for achieving good quality building. They draw on BRE experience and research, and other sources, to provide clear technical advice and solutions.

Good Repair Guides are accessible guides to the defects most commonly encountered in buildings and offer sound advice on putting them right. They are highly illustrated to make the problems and solutions easy to identify and understand.

Included on this CD are pdfs of Good Building Guides, numbers 1-82 (excluding 3, 4 and 5 which have been withdrawn) and Good Repair Guides, numbers 1-37.

Adobe Acrobat Reader 5 or later for Windows or Macintosh is required to run this CD.

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Roofs and roofing
Structural design and performance

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Cladding
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GOOD BUILDING GUIDE GBG 82

RAINWATER HARVESTING FOR DOMESTIC PROPERTIES

Peter Trotman* and John Griggs+
*BRE Associate, +Chartered Institute of Plumbing and Heating Engineering

This Good Building Guide covers the use of rainwater in a domestic property. Most houses have some means of collecting run-off from one or more locations including the house, garage, shed and greenhouse roofs and, possibly, paved areas. Local water suppliers have encouraged this collection of rainwater by making available, at reasonable cost, water butts together with diverters to fit in the downpipe. Systems are now available to store collected rainwater and pump it for use for irrigation and WC flushing. The different options are described together with system design, components and materials.

It will be useful to designers and building owners wanting to reduce water consumption.

Piped water within the home is a requirement of national building regulations[1–3] and that supplied from the mains is designated 'wholesome water'. It must comply with the requirements of Regulations made under the Water Industry Act[4].

Water usage by a household will obviously vary depending upon lifestyle, occupation pattern and the installed appliances. Average consumption per capita in the UK is between 125 and 201 litres per person per day, with the higher figure from single-person households[5].

Most of the water used in the home is not consumed. Average figures for the European Union (EU) show that only 5% of wholesome water is used for drinking and cooking[6]. Hence, there is a great potential to use non-wholesome water for many of the current domestic uses. For example, typical proportions of UK household water used for various purposes include:

- 35% for bathing and personal hygiene
- 26% for WC flushing
- 12% for clothes washing

Figure 1: Compact rainwater butt

- 9% for dishwashing
- 7% for outside use, eg garden watering and car washing[7].

Although rainwater could be used for all of the above uses, the skin contact and risk of ingestion during washing and bathing would require treatment to near-wholesome water standards. However, the wastewater from bathing could be utilised for the other uses if greywater reuse was practised.

RADON SOLUTIONS IN HOMES

Positive house ventilation

Chris Scivyer

This Good Repair Guide offers guidance to builders and homeowners installing positive ventilation systems in homes. When controlled ventilation is provided to a house, indoor radon levels can be reduced and at the same time the indoor environment can be improved by reducing condensation, mould, stuffiness and stale odours. Advice is also given on system maintenance and what to do if a system fails to adequately reduce radon levels.

This Good Repair Guide is Part 2 in a 3-Part set and replaces the guidance given in BRE Report BR 281. Part 1 covers underfloor ventilation and Part 3 covers radon sump systems.

Figure 1: Roof-located positive ventilation system

Figure 2: Wall-mounted positive ventilation system

BACKGROUND

Radon

Radon is a naturally occurring radioactive gas that is present in all buildings. Prolonged exposure to high levels causes lung cancer. The Health Protection Agency (HPA) recommends that householders with concentrations above the action level (200 Bq m^{-3}) should reduce their radon concentrations as far as they can and ideally to below the target level (100 Bq m^{-3}).

What is positive ventilation?

Positive ventilation systems blow fresh filtered air into a property. Most systems comprise a fan unit located in the roof space (Figure 1). The air usually enters through a diffuser in the ceiling of the hallway or at the top of a stairway. The fan units should run continuously to effectively reduce radon concentrations. For properties without a roof space, such as flats and apartments, wall-mounted units are available (Figure 2).

Where can positive ventilation systems be used?

Positive ventilation systems are one of the least disruptive radon remedial measures to install. The systems are likely to work best:

GOOD REPAIR GUIDE GRG 37 Part 3

RADON SOLUTIONS IN HOMES

Radon sump systems

Chris Scivyer

This Good Repair Guide offers guidance to builders and homeowners installing radon sump systems in homes. It covers the installation of both active (fan-assisted) and passive sump systems. Advice is also given on system maintenance and what to do if the system fails to adequately reduce radon levels.

This Good Repair Guide is Part 3 in a 3-Part set and replaces the guidance given in BRE Report BR 227. Part 1 covers underfloor ventilation and Part 2 covers positive house ventilation.

This guide is split into three sections:

- introduction to radon and sump systems
- guidance on installing sump systems, including worksheets
- maintaining systems and what to do if a sump system does not reduce radon levels sufficiently.

BACKGROUND

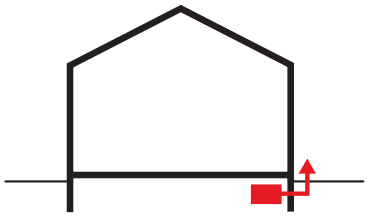
Radon

Radon is a naturally occurring radioactive gas that is present in all buildings. Prolonged exposure to high levels causes lung cancer. The Health Protection Agency (HPA) recommends that householders with concentrations above the action level (200 Bq m^{-3}) should reduce their radon concentrations as far as they can and ideally to below the target level (100 Bq m^{-3}).

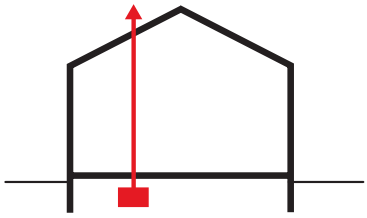
Where can sump systems be used?

These systems can be used on any building where:

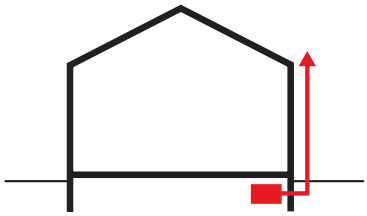
- there is a capping over the ground, such as a concrete groundbearing slab
- there is concrete capping to the soil beneath a suspended timber floor
- a standby sump was provided during construction (in newer homes); see pages 2 and 6.



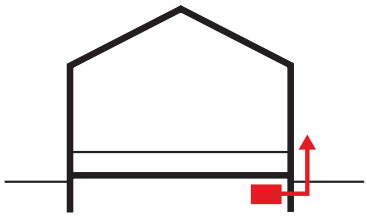
Externally constructed sump with low-level exhaust



Internally constructed sump with high-level exhaust



Externally constructed sump with high-level exhaust



Externally constructed sump with low-level exhaust to a timber floor with concrete capping to the soil below

Figure 1: Generic sump systems