

KEEPING UP WITH THE BUILDING REGULATIONS

– Recent changes to Approved Documents F, G, J and L

The core of the Building Regulations is made up of the fourteen parts of Schedule 1, from Part A (Structure) to Part P (Electrical Safety). Fourteen? There is no Part I or Part O.

Each part contains requirements described in general terms, and there is an Approved Document for each part. Approved Document A, for example, quotes the requirements of Part A and gives detailed guidance on how to comply with them. (Eg, there is a table showing the minimum width of strip foundations in different subsoils.) Usually, when people refer to the ‘Building Regulations’, knowingly or not they are invoking the requirements of Schedule 1 and the guidance in the Approved Documents.

If you build in the manner described in an Approved Document, there is a ‘presumption of compliance’ with the requirements. It’s not compulsory to follow the guidance, but, if you don’t, it will be much harder to satisfy the building inspector that your building complies. (As a last resort there are mechanisms for a relaxation, a dispensation, or an appeal – but these are rarely used.)

In order to keep up with prevailing concerns and new technologies, individual parts of Section 1 are occasionally revised, together with the corresponding Approved Document. During 2010, there was a bumper crop of revisions: a revised Part G came into effect in April, and revised Parts F, J and L in October.

Here is an outline of the main changes. (I should point out that I am writing about the regulations that apply to England and Wales – Scotland and Northern Ireland have their own variations.)

Approved Document G – Sanitation, hot water safety and water efficiency

This part was previously known as Hygiene, and the new title indicates its expanded scope.

The concept of ‘wholesome’ water has been introduced – wholesome water must be fit to drink. Non-wholesome water, eg, harvested rainwater or treated greywater, can be supplied to a WC, washing machine, or garden tap.

A new requirement attempts to reduce the future consumption of wholesome water. A prescribed methodology, The Water Efficiency Calculator for New Dwellings, gives a theoretical figure for the potential consumption of wholesome water per person per day. (See Further Info for the online calculator.) The calculated consumption should be less than 125 litres – cf, a national average for actual consumption of about 150 litres.

You can lower potential consumption by fitting water-efficient WC’s, taps, and shower-heads. WC’s are available with small, dual flushes (eg, 4 / 2½ litres). And a low-volume bath helps (eg, 140 litres). Flow limiters can be useful, too. (See Further Info.)

Of course, the actual consumption of water will depend on the occupants and the price of water. I have lamented before that gas and electricity supplies benefit from a reduced VAT rate of 5%. The situation for water is worse. The government urges us to be frugal with water, yet gives the most preferential VAT rate of all, 0%, to water supplies – ridiculous.

The safety requirement that formerly applied only to unvented hot water systems now applies to vented systems, too. And the requirement has been made more comprehensive: all hot water storage vessels must be able to resist excessive temperature or pressure resulting from a malfunction.

Another new requirement is that water from a bath tap must not be hotter than 48°C, to prevent scalding. Fit a Thermostatic Mixing Valve (TMV) in the pipework near the tap; or, more simply, fit a thermostatic mixer tap.

One other point:

It has long been a convention that hot taps are fitted on the left – now this practice is in the Approved Document.

Approved Document F – Ventilation

A new requirement is that a notice must be given to Building Control after a mechanical ventilation system has been installed. Air flow rates must be measured on site – this even applies to simple extract fans and cooker hoods. More complex systems must be properly commissioned; in particular, the flow rates must be properly adjusted. (Too often in the past, ventilation systems were installed but not properly commissioned.)

As with other Approved Documents, the key terms are explained. In this document, ‘air permeability’ is a key term:

Air permeability is the physical property used to measure the airtightness of the building fabric. It is defined as air leakage rate per hour per square metre of envelope area at a test reference pressure differential across the building envelope of 50 Pascal (ie, 50 N/m²).

The air permeability of a dwelling can be measured. A ‘blower door’ is fitted to a doorway and air blown into the dwelling to create the required test pressure of 50 Pascal – this is the sort of pressure which could be developed by a strong wind blowing onto the dwelling. In a steady state, the rate at which the fan blows air into the dwelling equals the rate at which air escapes through cracks, etc. The fan’s air flow rate is metered, and from the reading the air permeability can be calculated. (The test can alternatively be done by sucking air out.) The unit used is m³/h.m², where m³/h refers to the air flow rate in cubic metres per hour, and m² refers to the area of the envelope – ie, the area of the outside walls (including the windows and external doors), the top ceiling, and the bottom floor.

In days gone by, ventilation was left to accidental effects, eg, chimney flues, drafty windows, etc. For better energy efficiency, a building needs to be more airtight and ventilation needs to be more controllable. The subject has become so complex that the guidance of the Approved Document is now supplemented by a new publication, the Domestic Ventilation Compliance Guide. (See Further Info.)

Even so, there are methods of ventilation not covered in either document, and the Approved Document says that other methods may be acceptable. As examples, it mentions Positive Input Ventilation and Supply Air Windows – to which might sometime be added Dynamic Insulation (as described in my article last month).

In the quest for energy efficiency, new dwellings will be built to higher standards of airtightness. An air permeability of less than 5 m³/h.m² is quite airtight, and the

new guidance requires more ventilation in such cases. (Theoretically, the dwelling is considered to be completely airtight, ie, there is no infiltration to supply fresh air.)

By the way, as we see below, the new Part L1A sets an upper limit on air permeability: $10 \text{ m}^3/\text{h.m}^2$.

(For more about ventilation methods, see my SelfBuild & Design articles in the first six months of 2007.)

Approved Document J – Combustion appliances and fuel storage systems

A new requirement is that a carbon monoxide alarm is to be fitted near a combustion appliance, eg, a wood stove:

J2A. Where a fixed combustion appliance is provided, appropriate provision shall be made to detect and give warning of the release of carbon monoxide.

The guidance is that the alarm (battery or mains powered) should be located on the ceiling or wall, at a horizontal distance from the appliance of 1 to 3 metres.

Formerly, no air vent was required for a small combustion appliance (with an output below 5kW). But the new guidance is that in a house with good airtightness (air permeability below $5 \text{ m}^3/\text{h.m}^2$) a vent is required – as it is for larger appliances whatever the air permeability.

For example, for a small, 4 kW wood-stove, a permanently open vent with a minimum area of 22 sq cm is asked for. But it would be silly to try to build an airtight house with such a big hole in the envelope. Instead, choose a woodstove which has been designed so that it can be fitted with a duct to take in air from the outside. (At present, there are few such wood-stoves.)

Approved Document L1A – Conservation of Fuel and Power in New Dwellings

A CO₂ Dwelling Emission Rate (DER) is now required to be calculated at the design stage. The calculation, together with the design air permeability and other relevant specifications, must be submitted to Building Control before building work commences. This is in addition to the pre-existing requirement for a calculation of the DER based on the measured air permeability at the end of the build. The intent of the new requirement is apparently to prompt builders to consider the desired level of airtightness as they build. (Prudent builders may wish to have an extra blower-door test done, perhaps before second fix.)

Note that, for an individual dwelling such as a selfbuild, it is not compulsory to measure the air permeability. Instead, a poor default value, $15 \text{ m}^3/\text{h.m}^2$, can be used in calculating the Dwelling Emission Rate.

Despite its name, SAP2009 came into force with this document, ie, in October 2010. (SAP stands for Standard Assessment Procedure, a methodology for calculating the energy requirements and carbon dioxide emissions of a building.)

The biggest change in practice results from the 25% reduction in the Target Emission Rate (TER) produced by the new SAP. (The TER is the upper limit for the DER.) Put simply, a dwelling now has to be 25% more efficient in its use of energy derived from fossil fuels. (Installing thicker insulation will generally be sufficient to reach the new target.)

The lowering of the CO₂ emissions limit by 25% is a step towards the government's ambition for new dwellings: the 2016 zero-carbon target. (At the time of writing, early December, the long promised definition of 'zero carbon' has still not materialised. The Coalition housing minister, Grant Shapps, said in June that a definition would be given 'within weeks'; later, it would be 'in October'. In fact, the Zero Carbon Hub are still conducting public consultations about the definition on behalf of the government. Presumably, it has been problematic to find a fudged definition of 'zero-carbon' such that it will be possible to meet the so-called 'zero-carbon' target without excessive difficulty, no matter what sort of housing development is under consideration.)

Most of the limits for U-values have been lowered:

Roof	0.2
Floors	0.25
Walls	0.3
Windows	2.0

Limiting U-values (W / m² °C)

(U-values that are much lower than the above limits are generally required in practice.)

These maximum U-values should be of no relevance to most selfbuilders. To achieve a satisfactory Dwelling Emission Rate, your U-values will have to be much lower than the figures above.

As stated previously, new guidance gives a maximum limit for air permeability: 10 m³/h.m².

To achieve a thermally efficient house, attention has to be given to thermal bridges, and the guidance on this in the Approved Document has been expanded.

Thermal bridges usually occur where one building element meets another, in particular where a wall meets the ground floor, roof, or windows. Calculating the heat losses at thermal bridges involves advanced mathematics, though software can do it for you or – more likely – for your architect. However, you don't necessarily require these calculations, as SAP includes conservative (poor) default values which can be used instead.

Theoretically, another alternative would be to use accredited construction details in the design. (Such an accredited scheme would incorporate random site inspections to check the quality of the workmanship.) However, at present there is no such scheme for thermal bridging. (Though there might be one soon. See Further Info.)

You no longer need to fit dedicated low-energy light fittings. You can fit ordinary, bayonet light fittings – as long as 75% of the light fittings in the dwelling have energy efficient bulbs in them. (This makes sense as the phasing out of tungsten filament bulbs is due to be completed in 2011.)

Approved Document L1A is augmented by two further guides: the *Domestic Building Services Compliance Guide*, and the previously mentioned *Domestic Ventilation Compliance Guide*.

FURTHER INFO:

Approved Documents

Free pdf downloads – you need a recent version of Adobe Reader.
www.planningportal.gov.uk.

Domestic Ventilation Compliance Guide

www.planningportal.gov.uk/uploads/br/domestic_ventilation_compliance_guide_2010.pdf.

Domestic Building Services Compliance Guide

Covers many types of heating systems, as well as mechanical ventilation, cooling, and lighting. (Includes renewables.)
www.planningportal.gov.uk/uploads/br/domestic_building_services_compliance_guide_2010.pdf.

Water Efficiency Calculator

www.wrcplc.co.uk/partcalculator/Default.aspx.

Water Efficiency Labelling Scheme

Has a partial list of water efficient products.
www.water-efficiencylabel.org.uk/view_products.asp.

Hot Water Association

Download diagrams interpreting the hot water storage guidance. See News pages:
www.hotwater.org.uk.

Thermal bridging details

Robust Details Limited and the British Board of Agrément have announced their intention to offer a quality-assured, accredited detail scheme to deal with thermal bridges. (Robust Details Ltd already offer accredited details for sound insulation – which is necessary for apartments, etc.)

Zero Carbon Hub

www.zerocarbonhub.org.

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