The Practical Application of Energy Efficiency Improvements in Social Housing

The UK deals with the standards applicable to retrofitting of Social Housing though a number of vehicles:

1. The **Decent Homes Standard**
A decent home is one that meets the following criteria:

- is above the current statutory minimum standard for housing;
- is in a reasonable state of repair;
- has reasonably modern facilities and services;
- provides a reasonable degree of thermal comfort.

The Decent Home standard is a component of the UK's Fuel Poverty Strategy which outlines a number of other schemes and initiatives which will tackle fuel poverty. The new measure of thermal comfort is the most effective way of increasing the energy efficiency of a home and therefore will contribute to the reduction in the level of fuel poverty in the social sector

2. The **Building Control** legislation provides a minimum standard
Part L of the Building regulations for England & Wales (similar provisions apply under different legislation in Scotland and northern Ireland) seeks to limit heat loss by

- Insulation of building
- Airtight building
- Insulation of pipework, etc.

Part L sets Performance Targets

Heating & hot water
Efficient appliances
Controls for timing and temperature
Lighting
Switching
Energy efficient

Revisions to Part L raise these Performance Targets. For example, prior to April 2006 the minimum thermal efficiency of walls on new construction was set at 0.35W/m²K. From April 2006 this is increased to 0.30W/m²K

3 The recently introduced **Health and Housing Safety Rating System**, based on risk assessments, will provide a flexible, and hopefully effective enforcement regime but insufficient education of the landlords and managers on the methodology and the real risks associated with energy inefficiency (cold, damp, etc.)

The principle behind the Housing Health and Safety Rating System is that - A dwelling, including the structure, the means of access, any associated outbuildings and garden, yard and/or other amenity space, should provide a safe and healthy environment for the occupants and any visitors.

To satisfy this principle -

- a dwelling should be free from unnecessary and avoidable hazards; and
- where hazards are necessary or unavoidable, they should be made as safe as reasonably possible.

This approach acknowledges that all dwellings, even new ones, contain hazards. The Rating System is designed to rate the severity of hazards. It, therefore, differentiates between those where there is a small chance of relatively minor harm and those where there is an imminent risk of major harm or death. The higher the hazard score, the greater the threat to health and safety.

For the purposes of the System -

- A Fault is a failure of an element to meet the Ideal, whether that failure is inherent, such as a result of the original construction or manufacture, or a result of deterioration or a want of repair or maintenance.
- The Ideal is the currently perceived model for an element which defines the functions and safest performance criteria that can be expected of that element.
- An Element is any component or constituent part, facility or amenity of a dwelling, such as a wall, a window, a staircase, a bath, means of lighting, and means of space heating.
- A Hazard is the effect which may result from a fault and which has the potential to cause harm.

The System places the emphasis on hazards - the effect, rather than the fault. This means that for the assessment, the cost or extent of remedial work is irrelevant, it is the potential for harm which is the significant factor. However, the System allows for all faults to be recorded, including those which do not currently contribute to a hazard, so that they may be taken into account if action is contemplated. The assessment involves judging each Element of a dwelling against an Ideal for that particular element. Any faults identified are then assessed for their potential to cause harm.

Potential hazards are assessed in relation to the most vulnerable class of person who might typically occupy or visit the dwelling. For example, gaps to balustrades are judged in relation to a young child. This approach ensures it is the dwelling which is rated irrespective of the current occupants. To generate a Hazard Score, the surveyor gives -

- the likelihood of an occurrence which could result in major harm; and
- the spread of health outcomes or harm which could from such an incident.

Details of average likelihoods and harm outcomes for a range of hazards are provided in the guidance.

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The possible Harms (or health outcomes) which may result from an occurrence are categorised according to the perceived severity. Four Classes of Harm are used for the purposes of the System. These are harms of sufficient severity that will generally require medical attention and, therefore, are likely to be recorded. The four Classes of Harm are -

Class I	including, death, permanent paralysis below the neck, regular severe pneumonia, and 80% burns.
Class II	including, chronic confusion, regular severe fever, loss of a hand or foot and serious fractures.
Class III	including, chronic severe stress, regular and persistent dermatitis, loss of a finger, severe concussion and serious strain or sprain injuries.
Class IV	chronic or regular skin irritation, benign tumours, slight concussion, moderate cuts to face or body and regular serious coughs or colds.

A weighting is given to each Class of Harm to reflect the degree of incapacity of each Class. The weightings are, Class I - 10,000; Class II - 1,000; Class III - 300; and Class IV - 10.

Although one harm (or health outcome) is the most likely, other outcomes are possible, which may be more or less severe. For example, there may be a 60% chance or a Class III Harm, with a 30% chance of a Class IV Harm and a 10% chance of a more serious Class II Harm.

I give as an example the issue of dampness and mould growth

Hazards from	Vulnerable Group	**Statistics**	Harm Outcomes	Ideal
Damp and Mould Growth etc: Includes risks from house dust mites, mould and fungal spores.	Children 5 - 14 years	**Likelihood -** - All dwellings - 1 in 18 - pre-1919 - 1 in 10 - post 1980 - 1 in 32 **Typical Hazard Scores -** - 10 or less in best 5% of stock - 1,700 or more in worst 0.13% of stock	Class I - 0% Class II - 0.1% Class III - 1% Class IV - 99%	Relative humidity between 45% and 60%. No mould growth or dampness.

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4. The **Proposed Code for Sustainable Homes** Consultation Paper, issued in 2006, started from the premise that homes constructed today should be built to last for at least 60 years. It will be a lost opportunity if house-builders fail to recognise how much the climate of the UK could change even by 2030.

This proposal is for a different approach: one that builds upon current regulations, and moves a stage further; builds upon people's willingness to think about sustainability and to use their purchasing power to obtain it; and offers an alternative to regulation and a way to incorporate sustainability in new homes voluntarily.

The Code as currently proposed will have six essential elements. These are:

1 energy efficiency in the fabric of the building and appliances in the building. This covers, for example, the standard of insulation or the use of solar heating. It may include 'A' rated kitchen appliances (where fitted) or low energy light bulbs;
2 water efficiency, for example, fitting dual or low flush toilets and reduced flow taps;
3 surface water management, for example sustainable drainage;
4 site waste management, as building construction is responsible for a significant proportion of waste that currently goes to landfill;
5 household waste management. This means providing space for bins, such as segmented kitchen bins for recycling waste;
6 use of materials, for example, using low allergy materials.

Minimum standards will be set for each essential element and all of these must be achieved if a home is to meet Code standards. Where there is a relevant building regulation, then the minimum Code standard will at least equal or exceed it. In addition, it is proposed that homes built to higher Code standards may have some of the following features:

- Lifetime Homes. This is about internal adaptability so that a home can be adapted for use of an elderly or disabled person;
- additional sound insulation which is important especially in apartment developments;
- private external space which may be a garden or a balcony;
- higher daylighting standards which is beneficial to health and reduces the need for electric lighting;
- improved security; and finally
- a home user guide. This is a home log book and will advise purchasers on the details of the sustainability of their home.

The Code is performance-based which means that it does not prescribe how a particular standard should be achieved. Rather, it sets a standard and allows the house-builder to deliver the required level of sustainability.

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It is proposed that the Code should have five levels:

1. a base level that meets the minimum standard in each of the six essential elements;
2. three further levels that deliver all of the minimum standards and additional levels of sustainability either by meeting higher standards in some of the essential elements or by offering some of the optional elements; or a combination of both; and
3. a level which delivers 80% or more of the Code.

I now turn to the Use and the users of the dwelling – **The Occupants**.

The use of a dwelling has a substantial impact on its energy efficiency and its health. By this I mean not just the health of the Occupants but also the "health" of the building Guidance for Occupants on how to use their homes is often sparse or couched in language which is not accessible to those outside of the construction industry.

One of the major problems for Occupants is Condensation and mould

Condensation occurs due an imbalance of insulation, heating and ventilation. Moisture is generated by normal household usage, although in particular circumstances this can be exacerbated by lifestyle. How can this be addressed?

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- Insulation
  Generally dependent on the construction of the dwelling . The Building Codes set the standards and **this element is usually not variable** by the Occupant
- Heating
  Generally dependent on the construction of the dwelling . The Building Codes set the standards and **this element is variable** by the Occupant who has control over usage
- Ventilation
  Generally dependent on the construction of the dwelling . The Building Codes set the standards and **this element is variable** by the Occupant who has control over usage

Occupants are not provided with adequate guidance on how to use their homes When you buy an appliance or a gadget you get an instruction book. When you buy a car you get an instruction manual. These documents tell you how to use the equipment for optimum performance and give guidance on maintenance, cleaning and repair.

Remedying condensation dampness and mould growth is apparently simple – achieve a balance between insulation, heating and ventilation

- Ventilation: Install automatic (i.e. humidistat controlled) extract fans, operating separately from lights
- Heating to be controlled by timed air thermostats, correctly set.

Occupants are (naturally) anxious about additional energy costs. The immediate impact on the Occupant is two-fold - Costs and Comfort. There is inadequate promulgation of any research and reassurance to demonstrate, for example, that

- intermittent heating can increase rather than reduce costs.
- Switching off ventilation will increase moisture retention > reducing comfort levels

It must not be forgotten that the Landlord can also obtain benefits from increased comfort for the Occupant for example:

- Reduction in rent arrears and consequent housing management costs
- Reduction in dispute costs
  - Legal
  - Management
- Reduction in repair costs due to premature failure
  - Kitchen units
  - Plaster
  - Flooring
  - Windows

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Finally, Landlords should consider the disruptive effect of retrofitting energy efficiency works and maximise the use of appropriate opportunities to carry out major works when they will be less disruptive, for example:

- Insulation when property becomes empty/ refurbished
- Heating works in warmer weather (but not school holidays when the home is crowded)
- Ventilation and heating at the same time

Patrick Reddin, FBeng, FRICS, ACIH,

Reddin & Co. Ltd., *Chartered Building Surveyors and Corporate Building Engineers*

Honorary Secretary **Association of Building Engineers**

Reddin & Company Ltd
Reddin Housing Services Ltd
No.1 The Broadway · London N8 8DU · UK
Tel: +44 (0)20 8348 4674
Fax: +44 (0)20 8340 7653

Also at
Casilla 14812 · La Paz · Bolivia
Tel: +591 2 22431636

www.reddin.co.uk

www.abe.org.uk