CATEGORIES 4, 5, 6, AND 7 OF THE CODE FOR SUSTAINABLE HOMES
– Surface Water Run-Off; Waste; Pollution; Health And Well-Being

We continue with our exploration of the Code for Sustainable Homes, looking this month at four of the nine categories considered in the Code. (For the Code’s methodology, see earlier articles.)

CATEGORY 4 – SURFACE WATER RUN-OFF

Maximum number of credits: 4.
One credit converts to 0.55 points, so the maximum number of points is only 2.2.

Management of Surface Water Run-off from the Development

Aim: To avoid, reduce, and delay the discharge of rainfall run-off to watercourses and public sewers by the use of SuDS techniques.

Credits available: 2. Mandatory at all Levels.

The Technical Guide for the Code promotes the use of SuDS techniques to manage surface water run-off. ‘SuDS’ stands for Sustainable Drainage System. The reader may also come across references to ‘SUDS’, which originally stood for Sustainable Urban Drainage System. But the earlier expression, SUDS, has morphed into SuDS, ie, there is no practical difference between them.

The Code for Sustainable Homes has been designed primarily for the development of large sites with many repetitive dwellings, not, unfortunately, for an individual plot. For a one-off home, some of the requirements of the Code are excessive. For example, it is mandatory for this issue to appoint ‘an appropriately qualified professional’. Quoting from the Technical Guide, ‘Suitable professionals may be found in a variety of disciplines, such as engineering, landscape design, or hydrology, or a combination’.

Also mandatory is a Flood Risk Assessment – see Further Info.

And a third mandatory requirement is that the development does not increase the surface water run-off – neither the peak rate of run-off nor the overall rate. SuDS techniques that can help are permeable paving for the driveway, and soakaways. (Soakaways can be made as a pit or a trench. Note, though, that some soils, particularly clayey ones, can be too impermeable for a soakaway – however, you may be able to get beneath the clay by digging deep.)

Another useful SuDS technique is rainwater harvesting. (This also helps you gain credits in Category 2, Water.)

For this issue, a credit is available if there is no run-off for 5mm of rain, and another credit if the run-off from hard surfaces is clean.

Flood Risk

Aim: To promote housing development in low flood risk areas; and elsewhere to reduce the impact of flooding.

Credits available: 2.

You can gain a couple of credits if:
• Your plot has a low probability of flooding from rivers and the sea; ie, it is in Flood Zone 1. (See Further Info for more about Flood Zones.)
   And:
• A Flood Risk Assessment for the plot indicates that there is a low risk of flooding from overflowing sewers, as well as rivers and the sea.

If your plot is in Zone 2 or 3a, you can still gain a credit by building the ground floor and access routes at least 60 cm above the design flood level of the Flood Zone.

I remember that in the Eighties there was not so much information available about flooding. I had purchased a plot and there were other houses close by; the idea of flooding didn’t enter my mind. But it did when, on clearing the site, I came across an abandoned highway sign with the warning: ‘Flood’. That prompted some enquiries to the neighbours – their homes had indeed been flooded by overflowing sewers the previous year. So luckily forewarned, I raised the foundations higher out of the ground.

**CATEGORY 5 – WASTE**

Maximum number of credits: 8.
One credit converts to 0.8 points, so the maximum number of points for Waste is **6.4**.

**Storage of household waste**

*Aim:* To provide adequate internal and external space for waste.
Credits available: 4. Mandatory at all Levels.

It is mandatory at all Code Levels that there is sufficient external space allocated for waste storage – no problem for most selfbuilds. (In old-speak, waste storage = dustbins.)

The Technical Guide has four pages devoted to the provision of access from the external door to the external space for waste storage. In short, a gently sloping pathway must link the two and be usable by wheelchair.

For credits, one or more internal storage bins are required for recycling materials (eg, paper, glass, and textiles). Some local authorities collect these mixed together, in which case one 30 litre bin is sufficient. If they are collected separately, then bins of the appropriate number are required, with a total volume of 30 litres or more.

A generous four credits are awarded for this.

**Composting**

*Aim:* To provide compost facilities in order to reduce landfill.
Credits available: 1.

You can gain an easy credit by installing a composting container in the garden. (Access must be via a gently sloping pathway, as above.) As a selfbuilder, you must also provide yourself with information about composting.

**Construction Site Waste Management**

*Aim:* To promote resource efficiency via the effective management of construction site waste.
Credits available: 3.
You need – anticipatory drum-roll – a Site Waste Management Plan. Your SWMP should contain procedures and commitments for waste minimisation and for diversion from landfill. Since selfbuilders are spending their own money, they hardly need a SWMP to encourage them to minimise waste. (Over-ordering during a build is sometimes prudent – but not too much!) Divert surplus material from landfill by:

- Selling it;
- Finding some imaginative use for it;
- Keeping it for future use.

Anyway, in a SWMP, the amount of waste produced, reduced, re-used, and recycled is monitored. (See Further Info to download a ‘Simple Guide to Site Waste Management Plans’. Free SWMP templates are also available.)

There are eighteen waste groups to be monitored:

- Bricks
- Concrete
- Insulation
- Packaging
- Timber
- Electrical and electronic equipment
- Canteen/office/ad hoc
- Asphalt and tar
- Tiles and ceramics
- Inert
- Metals
- Gypsum
- Plastics
- Floor coverings
- Soils
- Hazardous
- Architectural features
- Other/mixed.

If you have a suitable SWMP and you minimise waste for at least three of these waste groups, you gain a credit. (Note that if your projected build cost is more than £300,000, the Clean Neighbourhoods and Environment Act 2005 makes a SWMP a legal obligation.)

You can gain further credits by diverting waste from landfill:

<table>
<thead>
<tr>
<th>Percentage of waste diverted from landfill</th>
<th>50%</th>
<th>85%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further credits</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Credits for minimising landfill**

(Presumably no credits for fly tipping!)

**CATEGORY 6 – POLLUTION**

Maximum number of credits: 4.

One credit converts to 0.7 points, so the maximum number of points for Pollution is **2.8**.

*Global Warming Potential of Insulation*

*Aim: To reduce the use of foamed insulation that has a high Global Warming Potential (GWP).*

Credits available: 1.

The following should be free of insulation with a high GWP:

- Roof (including loft hatch).
- Walls (including lintels).
- Floors.
- Hot water cylinder, thermal store, pipe insulation.
• Cold water tank.
• External doors.

Any blowing agent used in the manufacture or installation of insulation for the above should have a GWP of less than 5.

The following gases are satisfactory:
Air, Carbon Dioxide (by definition its GWP is 1), Pentane, and Isobutene.

**NOx Emissions**

*Aim: To reduce the emissions of nitrogen oxide, NOx.*

Credits available: 3.

Nitrogen oxide (NOx) is a term for two of the gases produced in combustion: nitric oxide (NO) and nitrogen dioxide (NO₂).

<table>
<thead>
<tr>
<th>NOx level (mg/kWh)</th>
<th>Boiler Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>70</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credits for clean burning boilers**

Note: ‘NOx’ is pronounced like ‘knocks’. Sometimes ‘Boiler class’ is called ‘NOx Class’.

A good condensing boiler should gain you some credits here.

Some oil boilers have come to the market this year which can gain credits. But, as yet, the NOx emissions of all log and pellet boilers are too high for credits.

You may think that by using electrical heating you are avoiding NOx emissions. Not so! A whopping 1,200 mg of NOx is associated with each kWh of mains electricity.

So the use of a heat pump will not lead to any credits for this issue.

**CATEGORY 7 – HEALTH AND WELL-BEING**

Maximum number of credits: 12.

One credit converts to 1.17 points, so the maximum number of points is an appreciable 14.

**Daylighting**

*Aim: To promote good daylighting, so the quality of life is improved and energy conserved.*

Credits available: 3.

The Technical Guide give a sophisticated formula for calculating the ‘average daylight factor’ in a room. The factors used in the formula are:

• Area of glazing.
• Total surface area of ceiling, floor, walls and windows.
• Average reflectance of these surfaces. Reflectance of matt magnolia paint is about 83%. As a default value, the Guide suggests that the average reflectance for all room surfaces is only 50%. (The low value is presumably partly explained by the low reflectance of a typical floor.)

• Correction factor for dirt. Roof-lights tend to be dirtier than vertical windows, reducing light transmission by about 20%.

• Glass transmission factor. Triple glazing and low-e double glazing reduce light transmission by about 40%.

• Angle of the visible sky.

(Technophiles can consult the Guide to find the formula.)

There is a credit available for each of the following:

• Kitchen – Its average daylight factor is at least 2%.

• Any living room, dining room, study, or Home Office – The average daylight factor for the room is at least 1.5%.

• Any room listed above – At least 80% of the ‘working plane’ of the room receives light directly from the sky. (The working plane is a plane 0.85 metres above the floor.)

The guidance recommends that the calculations are done by a ‘daylighting expert’, and that computer simulation software is used for complex room geometries – all too sophisticated in my book. But at least the Guidance does suggest that the calculation may need to be done only for what can reasonable be considered the least well lit room(s). If these have enough daylight, then calculations are not needed for the other rooms.

**Sound insulation**

*Aim: To promote the provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.*

Credits available: 4.

A selfbuilder gets an automatic 4 credits, for building a detached dwelling.

**Private space**

*Aim: To promote the provision of outdoor space which is at least partially private.*

Credits available: 1.

Most selfbuilders gets another automatic credit here, for having a garden. No garden? Balconies, a roof terrace, or a shared courtyard may be sufficient.

**Lifetime Homes**
**Aim:** To promote the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants.


I must have a rant about the misuse of words in the Code’s ‘Aim’, above.

What’s the point of building a home that is not accessible? Whether or not a home is accessible by wheelchair is another matter. And a future need of mine could be a home sauna. Must my home be easily adaptable to meet that future need? I think not. ‘Changing needs’ is a silly euphemism for ‘physical infirmity’.

The Lifetime Homes Standard is a set of sixteen design criteria which are intended to make a home easily adaptable for the lifetime use of its occupants. The criteria are given on the Lifetime Homes website – see Further Info. (I intend to write more about Lifetime Homes in a future article.)

To gain the 4 credits available for this issue, all the 16 criteria of Lifetime Homes need to be met. Some modifications are likely to be necessary in the design of your home, and, in particular, the choice of windows is very restricted – the handle must be no more than 1.2 m above the floor.

On a plot with a strong slope (more than 1:15), it may not be physically possible to satisfy Criteria 2 and 3 of the Lifetime Homes Standard (about the gradients of pathways). But if the other 14 criteria are met, 3 credits are gained and the mandatory requirement for Code Level 6 is waived.

**Next month:** The last two CSH categories, Management and Ecology.

**FURTHER INFO:**

**Code for Sustainable Homes Technical Guide, November 2010**
Free download from:

**Environment Agency**
Free downloads – but the links are hard to find on their website. (Use Google.)
Mostly applicable to large sites:

- **Sustainable Drainage Systems (SUDS) – A guide for developers** (12 pages);
- **Sustainable Drainage Systems – An introduction** (28 pages).
Their online flood map shows Flood Zones for any given Postcode. (Flood Zones are defined in Planning Policy Statement 25: Development and Flood Risk.)
Also available: advice on making a Flood Risk Assessment.
www.environment-agency.gov.uk.

**NHBC Foundation**
Free downloads after free registration:

- **A Simple Guide to Sustainable Drainage Systems for Housing**
  (NF22 – 92 pages);
- **Site Waste Management – Guidance and Templates for Effective Site Waste Management Plans**
  (NF8 – templates for a SWMP are supplied as pdf’s or Excel files).
www.nhbcfoundation.org.

**Construction Industry Research and Information Association**
Two free downloads (after free registration with CIRIA):

CSH CATEGORIES 4, 5, 6 AND 7 6 JUNE 2011.
The SUDS manual (C697); Site handbook for the construction of SUDS (C698). www.ciria.org.uk/suds/publications.htm.

A Simple Guide to Site Waste Management Plans
Free download (13 pages) from: www.netregs-swmp.co.uk.

SMARTWaste
BRE site with free registration. Their online SmartWaste Plan and free user guide enable you to set up a SWMP.
www.smartwaste.co.uk.

WRAP
The Waste and Resource Action Program offers, amongst a lot else, a free SWMP.
www.wrap.org.uk.

Lifetime Homes
“A model for building accessible and adaptable homes.”
www.lifetimehomes.org.uk.

Words: 2240.

© Copyright article by Robert Matthews in SelfBuild & Design magazine, June, 2011.