CIBSE LOW CARBON CONSULTANTS REGISTER – SESSION 5
BUILDING REGULATIONS APPROVED DOCUMENT L2A

I – Prophets energy services 03012013
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<td>Slide 58</td>
</tr>
</tbody>
</table>
DEMONSTRATING COMPLIANCE
Conservation of Fuel and Power

L1. Reasonable provision shall be made for the conservation of fuel and power in buildings by:
   (a) limiting heat gains and losses—
       (i) through thermal elements and other parts of the building fabric; and
       (ii) from pipes, ducts and vessels used for space heating, space cooling and hot water services;
   (b) providing fixed building services which—
       (i) are energy efficient;
       (ii) have effective controls; and
       (iii) are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances; and
   (c) providing to the owner sufficient information about the building, the fixed building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.
Criteria to demonstrate compliance

• Criterion One – Achieving acceptable building CO2 emission rate (BER)
• Criterion Two – Limits on design flexibility

• Criterion Three – Limiting solar gain in summer

• Criterion Four – Building performance consistent with BER

  Quality of Construction and Commissioning

• Criterion Five – Provisions for energy efficient operation of the building

  Providing Information
Project name

**MULTI-PURPOSE HALL**

| Date: Thu Jan 03 10:10:17 2013 |

**Administrative Information**

**Building Details**
- Address: MULTI-PURPOSE HALL, St James’s School, 260 Stanley Road, TWICKENHAM, TW2 5NP
- Certification tool: SBEM
- Calculation engine: v4.1.d.0
- Interface to calculation engine: v4.1.d
- BRUKL compliance check version: v4.1.d.0

**Owner Details**
- Name: St James Catholic Primary School
- Telephone number: 0208 8964670
- Address: 260 Stanley Road, Twickenham, TW2 5NP

**Certifier details**
- Name: <insert name>
- Telephone number: 9999999999
- Address: <insert address>, <insert city>, XX XXX

**Criterion 1: The calculated CO₂ emission rate for the building should not exceed the target**

| 1.1 | CO₂ emission rate from the notional building, kgCO₂/m².annum | 13.6 |
| 1.2 | Target CO₂ emission rate (TER), kgCO₂/m².annum | 13.6 |
| 1.3 | Building CO₂ emission rate (BER), kgCO₂/m².annum | 12.3 |
| 1.4 | Are emissions from the building less than or equal to the target? | BER <= TER |
| 1.5 | Are as built details the same as used in the BER calculations? | Separate submission |
## Compliance checklist

### Criterion 2: The performance of the building fabric and the building services systems should be no worse than the design limits

#### 2.a Building fabric

<table>
<thead>
<tr>
<th>Element</th>
<th>$U_{\text{lim}}$</th>
<th>$U_{\text{calc}}$</th>
<th>Surface where the maximum value occurs*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait***</td>
<td>0.35</td>
<td>0.24</td>
<td>z0/01north/n</td>
</tr>
<tr>
<td>Floor</td>
<td>0.25</td>
<td>0.12</td>
<td>z1/01north/w</td>
</tr>
<tr>
<td>Roof</td>
<td>0.25</td>
<td>0.25</td>
<td>z1/01north/c</td>
</tr>
<tr>
<td>Windows***, roof windows, and rooflights</td>
<td>2.2</td>
<td>2.1</td>
<td>z0/01north/s/g</td>
</tr>
<tr>
<td>Personnel doors</td>
<td>2.2</td>
<td>2</td>
<td>z0/01north/e/d</td>
</tr>
<tr>
<td>Vehicle access &amp; similar large doors</td>
<td>1.5</td>
<td>-</td>
<td>&quot;No heat loss vehicle access doors&quot;</td>
</tr>
</tbody>
</table>

High usage entrance

- $U_{\text{lim}} = \text{Limiting area-weight}$
- $U_{\text{calc}} = \text{Calculated area-weight}$

* There might be more than

** Automatic U-value check

*** Display windows and sit

N.B.: Neither roof ventilator

### Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES

### Whole building electric power factor achieved by power factor correction | <0.9

#### 1- HVAC for the example building

<table>
<thead>
<tr>
<th>Heating seasonal efficiency</th>
<th>Cooling seasonal efficiency</th>
<th>Specific fan power [W/(l/s)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.89</td>
<td>3.12</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | YES

*No HWS in project, or hot water is provided by HVAC system*

### Local mechanical ventilation and exhaust

<table>
<thead>
<tr>
<th>Zone</th>
<th>Supply &amp; extract SFP [W/(l/s)]</th>
<th>Exhaust SFP [W/(l/s)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>z1/03</td>
<td>-</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### Display lighting

<table>
<thead>
<tr>
<th>Zone</th>
<th>Lamps efficacy [lm/circuit W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>z0/01north</td>
<td>15</td>
</tr>
<tr>
<td>z0/01west</td>
<td>15</td>
</tr>
<tr>
<td>z0/01south</td>
<td>15</td>
</tr>
<tr>
<td>z0/01southwest</td>
<td>15</td>
</tr>
<tr>
<td>z0/01northwest</td>
<td>15</td>
</tr>
<tr>
<td>z0/03</td>
<td>15</td>
</tr>
</tbody>
</table>
## Compliance checklist

### Criterion 3: The spaces in the building have appropriate passive control measures to limit the effects of solar gains

<table>
<thead>
<tr>
<th>Zone</th>
<th>Solar gain limit exceeded? (%)</th>
<th>Internal blinds used?</th>
</tr>
</thead>
<tbody>
<tr>
<td>z0/02</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/02</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/03</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01north</td>
<td>NO (-54%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01west</td>
<td>YES (+5%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01south</td>
<td>NO (-35%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01north</td>
<td>NO (-23%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01west</td>
<td>YES (+5%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01south</td>
<td>YES (+5%)</td>
<td>NO</td>
</tr>
</tbody>
</table>

### Criterion 4: The performance of the building, as built, is consistent with the BER

1. **4.1** Have the key features of the design been included (or bettered) in practice? Separate submission
2. **4.2** Is the level of thermal bridging acceptable? Separate submission
3. **4.3** Has satisfactory documentary evidence of site inspection checks been produced? Separate submission
4. **4.4** Design air permeability

<table>
<thead>
<tr>
<th>Air Permeability</th>
<th>Worst acceptable standard</th>
<th>This building (Design value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>m3/(h.m2) at 50 Pa</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

5. **4.5** Has evidence been provided that demonstrates that the design air permeability has been achieved satisfactorily? Separate submission
6. **4.6** Has commissioning been completed satisfactorily? Separate submission
7. **4.7** Has evidence been provided that demonstrates that the ductwork is sufficiently airtight? Separate submission

### Criterion 5: Providing information

1. **5.1** Has a suitable building log-book been prepared? Separate submission
• Compliance – Hierarchy of Documents

Submission 1 – “As Designed”

BRUKL2
Approved Document
Check from SBEM

Criterion 1
Compliance 1.1 – 1.6
Achieving acceptable BER

Criterion 2
Compliance 2.1-2.3
Limits on design flexibility

Criterion 3
Compliance 3.1
Limiting Solar Gain in summer

Criterion 4
Compliance 4.4
Quality of construction and commissioning

Criterion 5
Providing information
• Compliance – Hierarchy of Documents

Submission 2 – “As Built”

CRITERION 1
Compliance 1.1 – 1.6
Achieving acceptable BER

CRITERION 2
Compliance 2.1 – 2.3
Compliance 2.4
From BRE IP6/96 & Guide 498
Compliance 2.5
From guidelines in TM39
Limits on design flexibility

CRITERION 3
Compliance 3.1
Limiting Solar Gain in summer

CRITERION 4
Compliance 4.1
Evidence of key features of the design
Compliance 4.2
Evidence of linear Thermal transmittance ACD?
Compliance 4.3
EPC
Compliance 4.4
Criterion 4
Compliance 4.4
Compliance 4.5
Pressure Test results
Compliance 4.6
Commissioning Plans
Compliance 4.7
Ductwork Test results
Quality of construction and commissioning

CRITERION 5
Compliance
Log Book TM31
Providing information

BRUKL2
Approved Document Check from cSBEM
“As Designed”
Compliance 1.7
Compliance – Enforcement

The main areas of enforcement are:
• non-compliance with the building regulations.
• dangerous structures.
• contravention of the building regulations.

Contravention of the building regulations is a criminal offence and action may be taken under Section 35 of the Building Act 1984, against a person who contravenes them. If convicted, that person is liable to be fined up to £5,000 for each offence and may also have to pay a daily fine if the default continues after conviction.

Section 36 of the Building Act allows a notice to be served requiring the owner to pull down or remove any work contravening the regulations, or to bring the work into compliance with the regulations.
• Types of work covered
  – All new buildings other than dwellings
  – Extensions to existing buildings, where
    • the total useful floor (gross floor area) area of the extension is > 100 m², AND
    • > 25% of the total useful floor area of the existing building
  – Fit-out works
    • where this is included as part of the construction of the building
    • where no fit out of services assume efficiencies
    • Calculation to be revised on first fit-out
    • ADL2B will apply to subsequent fit out work
  – Mixed-use developments
    • individual dwellings ADL1A applies
    • rooms for residential purposes are not dwellings
    • common parts, commercial or retail ADL2A applies
• Modular buildings
  – Special considerations apply
    • where intended life is greater than 2 years demonstrate compliance
    • If > 70% external envelope from sub-assemblies prior to BR issue date then adjustment factors apply
    • < 2 years can be based on TER/BER for generic types
    • Re-locating existing modules constitutes new build for BR purposes
  – Guidance in Energy performance standards for modular and portable buildings, MPBA
• Exempt buildings
  – If listed or in conservation area and compliance would unacceptably alter character
  – Included in the schedule of monuments
  – Industrial sites, workshops and non-residential agricultural buildings with low heat demands
  – Used primarily or solely as places of worship
  – Standalone buildings UFA < 50m²
  – Process buildings include if conditioning is for the benefit of the process (computer rooms, cold store etc)
CRITERION ONE – ACHIEVING ACCEPTABLE BUILDING CO2 EMISSION RATE (BER)
Criterion One
Actual Building Emissions $\leq$ TER

\[ \text{TER} = C_{\text{notional 2010}} \]

Where $C_{\text{notional 2010}}$ is derived from a notional building specification that delivers a 25% national aggregate improvement over 2006 standards.

Some buildings will have to improve by more than 25%, others by less.

Aggregate approach is intended to deliver equivalent £ per tonne CO2 saved across all building usage types.
• Criterion One

Reasons for Considering the Aggregated Approach
Criterion One

The Impact of the Aggregated Approach

• 2010 notional (TER) with no improvement factor is based upon the relative cost effectiveness of making energy efficiency improvements for typical building components

• Some Buildings will deliver more than 25%, some less, - optimised to deliver a national target of 25% when applied across the building mix
Criterion One

Criterion 1: Predicted CO₂ emission from proposed building does not exceed the target

The building does not comply with England and Wales Building Regulations Part L 2010

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>CO₂ emission rate from notional building, kgCO₂/m² annum</td>
<td>46.7</td>
</tr>
<tr>
<td>1.2</td>
<td>Target CO₂ Emission Rate (TER), kgCO₂/m² annum</td>
<td>46.7</td>
</tr>
<tr>
<td>1.3</td>
<td>Building CO₂ Emission Rate (BER), kgCO₂/m² annum</td>
<td>148.7</td>
</tr>
<tr>
<td>1.4</td>
<td>Are emissions from building less than or equal to the target?</td>
<td>BER &gt; TER</td>
</tr>
<tr>
<td>1.5</td>
<td>Are as built details the same as used in BER calculations?</td>
<td>Separate submission</td>
</tr>
</tbody>
</table>

No specific renewable element

Renewable requirement considered/required under local planning policy statements - *Local planning authorities may include policies in local development documents that require a percentage of the energy to be used in new residential, commercial or industrial developments to come from on-site renewable energy developments.*
Criterion One

Application of the Aggregated Approach

There are 3 Notional non domestic buildings types
• Top Lit - 
  Warehouses, retail sheds etc...
• Side Lit –  
  Commercial property, offices etc...
• Non Lit –  
  Theatres, cinemas etc...

The applicable notional building is defined through an activity database with a link to planning use classes
**Criterion One**

Example of new Building Typography

<table>
<thead>
<tr>
<th>New Building Categories (TCP Use Class)</th>
<th>Building Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1/A2 Shops and Financial and professional services</td>
<td>Shops and Financial and professional services</td>
</tr>
<tr>
<td>A3/A4/A5 Restaurant and cafes, drinking establishments and hot food takeaways</td>
<td>Restaurant and cafes, drinking establishments and hot food takeaways</td>
</tr>
<tr>
<td>B1 Business</td>
<td>General industrial and Special Industrial Groups</td>
</tr>
<tr>
<td>B2 to B7 General industrial and Special Industrial Groups</td>
<td>General industrial and Special Industrial Groups</td>
</tr>
<tr>
<td>B8 Storage or distribution Storage or distribution</td>
<td>Storage or distribution</td>
</tr>
<tr>
<td>C1 Hotels</td>
<td>Hotels</td>
</tr>
<tr>
<td>C2 Residential institutions</td>
<td>Residential Hospitals and Care Homes</td>
</tr>
<tr>
<td>C3 Secure Residential institutions</td>
<td>Residential Schools and Colleges</td>
</tr>
<tr>
<td>D1 Non-residential institutions</td>
<td>Community Day Centres</td>
</tr>
<tr>
<td></td>
<td>Libraries / Museums / Galleries</td>
</tr>
<tr>
<td></td>
<td>Primary Health Care</td>
</tr>
<tr>
<td></td>
<td>Crown and County Court</td>
</tr>
<tr>
<td>D2 Assembly and leisure</td>
<td>Assembly and leisure</td>
</tr>
<tr>
<td>Sul Generis</td>
<td>Launderettes</td>
</tr>
<tr>
<td></td>
<td>Passenger Terminals</td>
</tr>
<tr>
<td></td>
<td>Emergency Services</td>
</tr>
</tbody>
</table>
Achieving the target

– Enhanced management and control features
  • M & T (with out of range alarms)
  • power factor correction
### Enhanced management and control factors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Adjustment factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic monitoring and targeting with alarms for out of range values</td>
<td>5%</td>
</tr>
<tr>
<td>Power factor correction applied to the whole building to achieve a power factor of at least 0.90</td>
<td>1%</td>
</tr>
<tr>
<td>As above, but to 0.95</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Power factor adjustment can only be taken if the whole building is corrected, and the two levels are not additive.
CRITERIA TWO - LIMITS ON DESIGN FLEXIBILITY
## Criterion Two - Fabric

Table 5: Limiting fabric parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>U-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof</td>
<td>0.25 W/m².K</td>
</tr>
<tr>
<td>Wall</td>
<td>0.35 W/m².K</td>
</tr>
<tr>
<td>Floor</td>
<td>0.25 W/m².K</td>
</tr>
<tr>
<td>Windows, roof windows, rooflights, curtain walling &amp; pedestrian doors</td>
<td>2.2 W/m².K</td>
</tr>
<tr>
<td>Vehicle access and similar large doors</td>
<td>1.5 W/m².K</td>
</tr>
<tr>
<td>High usage entrance doors</td>
<td>3.5 W/m².K</td>
</tr>
<tr>
<td>Roof ventilators (inc. smoke vents)</td>
<td>3.5 W/m².K</td>
</tr>
<tr>
<td>Air permeability</td>
<td>10.0 m³/(h.m²) at 50 Pa</td>
</tr>
</tbody>
</table>

1. Excluding display windows and similar glazing. There is no limit on design flexibility for these exclusions but their impact on CO₂ emissions must be taken into account in calculations.
2. The U-values for roof windows and rooflights in this table are based on the U-value having been assessed with the roof window or rooflight in the vertical position. If a particular unit has been assessed in a plane other than the vertical, the standards given in this Approved Document should be modified by making an adjustment that is dependent on the slope of the unit following the guidance given in BR 443.
3. In buildings with high internal heat gains, a less demanding area weighted average U-value for the glazing may be an appropriate way of reducing overall CO₂ emissions and hence the BER. If this case can be made, then the average U-value for windows can be relaxed from the values given above. However values should be no worse than 2.7 W/m².K.

All U-values are area weighted averages.
Maximum U values W/m²K - area weighted average

Loft

Unheated space
• Criterion Two

• Reasonable provision to limit heat loss and gain through the fabric

• Fabric Backstops generally left unchanged from previous regulations – not most cost effective way to achieve improvements

• More emphasis on the quality of construction, thermal bridging and fixed building services

• More stringent fabric values will be required to meet TER for some building types
Criterion Two - Services

Non Domestic Building Services Compliance Guide

2010 Edition
Criterion Two - Services
What’s Covered..
Section 1  Introduction
Section 2  Gas, oil and biomass-fired boilers
Section 3  Heat pumps
Section 4  Gas and oil-fired warm air heaters
Section 5  Gas and oil-fired radiant technology
Section 6  Combined heat and power & community heating
Section 7  Direct electric space heating
Section 8  Domestic hot water
Section 9  Comfort cooling
Section 10 Air distribution systems
Section 11 Pipework and ductwork insulation
Section 12 Lighting
Section 13 Heating and cooling system glandless circulators and water pumps
Criterion Two - Services
NDBSCG details suggested performance standards and associated controls packages for majority of current building services technology.

Whilst not mandatory, Part L requires that fixed building services are provided which—
(i) are energy efficient;
(ii) have effective controls; and
(iii) are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances.
Criterion Two Services / Controls

Systems should be provided with appropriate controls to enable the achievement of reasonable standards of energy efficiency in use. In normal circumstances, the following features would be appropriate for heating, ventilation and air conditioning system controls:

a. the systems should be sub-divided into separate control zones to correspond to each area of the building that has a significantly different solar exposure, or pattern or type of use; and
Criterion Two

b. each separate control zone should be capable of independent timing and temperature control and, where appropriate, ventilation and air recirculation rate; and

c. the provision of the service should respond to the requirements of the space it serves. If both heating and cooling are provided, they should be controlled so as not to operate simultaneously; and

d. central plant should only operate as and when the zone systems require it. The default condition should be off.
Criterion Two - Metering

- Reasonable provision for energy meters would be install energy metering systems that enable:
  - a. at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories (heating, lighting etc.). Detailed guidance on how this can be achieved is given in CIBSE TM 39; and
  - b. the output of any renewable energy system to be separately monitored; and
  - c. in buildings with a total useful floor area greater than 1000 m$^2$, automatic meter reading and data collection facilities.
Criterion Two
Summary of key points

• Fabric standards defined in the AD
• Building services compliance guide covering performance standards for heating, hot water, ventilation, cooling, lighting, pumps etc.

– A key objective is to prevent renewable energy systems rescuing buildings with poor energy efficiency

• The requirement is to demonstrate that the fabric elements and the fixed building services all satisfy minimum energy efficiency standards as specified in the AD’s and the Building Services Compliance guide.

• In order to satisfy the TER, the building specification will need to be considerably better than these minima in many aspects of the design
CRITERION THREE – LIMITING THE EFFECTS OF SOLAR GAIN IN SUMMER
Criterion Three

• The guidance applies to all buildings, irrespective of whether they are air conditioned or not. The intention is to limit solar gains during the summer period to either:

a) reduce the need for air conditioning; or

b) reduce the installed capacity of any air conditioning system that is installed.
Criterion Three

Reference glazing systems

for every space that is predominantly side lit, the reference case is an east facing façade with full width glazing to a height of 1m. and having window units that have a framing factor of 10% and a solar energy transmittance (g-value) of 0.68

G-value calculated according to BS EN 410
Criterion Three
Reference glazing systems
for a space that is predominantly top lit, and with an average zone height less than 6m. the reference case is a horizontal roof of the same total area that is 10% glazed as viewed from the inside out and having roof lights that have a framing factor of 25% and solar energy transmittance (g-value) of 0.68

G-value calculated according to BS EN 410
Criterion Three

Reference glazing systems

for a space that is predominantly top lit, with an average zone height in excess of 6m, the reference case is a horizontal roof of the same total area that is 20% glazed as viewed from the inside out and having roof lights that have a framing factor of 15% and solar energy transmittance (g-value) of 0.46.

g-value calculated according to BS EN 410
Criterion Three

Many factors not covered by the compliance procedure will impact overheating

Compliance is achieved through demonstrating that for each occupied space, aggregated gains from April to September are no greater than for the reference glazing system

occupied spaces excludes transient areas, circulation areas toilets etc,
Criterion Three

Overheating is a design issue, not compliance

- Standard internal gains may not be appropriate
- Client/designer/occupier to ensure a satisfactory internal environment

Solar gain limit applies to air conditioned, mechanically and naturally ventilated spaces
Criterion Three

CIBSE TM37:2006

This publication provides guidance on the design of facades to incorporate appropriate levels of solar shading, and gives information on some of the design options available.

Avoiding overheating due to solar gain is a key design requirement to minimise the use of mechanical cooling and reduce energy consumption by cooling systems.
## Criteria Three

### Criterion 3: The spaces in the building have appropriate passive control measures to limit the effects of solar gains

<table>
<thead>
<tr>
<th>Zone</th>
<th>Solar gain limit exceeded? (%)</th>
<th>Internal blinds used?</th>
</tr>
</thead>
<tbody>
<tr>
<td>z0/02</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/02</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/03</td>
<td>NO (-100%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01north</td>
<td>NO (-54%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01west</td>
<td>YES (+5%)</td>
<td>NO</td>
</tr>
<tr>
<td>z0/01south</td>
<td>NO (-35%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01north</td>
<td>NO (-23%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01west</td>
<td>YES (+5%)</td>
<td>NO</td>
</tr>
<tr>
<td>z1/01south</td>
<td>YES (+8%)</td>
<td>NO</td>
</tr>
<tr>
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CRITERION FOUR – BUILDING PERFORMANCE CONSISTENT WITH BER
Criterion Four

Previously called Quality of Construction and Commissioning

Key areas:

• Air Permeability
• Commissioning
• Thermal Bridging
Criteria Four - Commissioning

- Regulation 20 requires commissioning to CIBSE Commissioning Management Code or equivalent procedures
- Report from a suitably qualified person
  - Member of Commissioning Specialists Assoc. or Commissioning Group of HVCA
- Confirm inspection and commissioning carried out to a reasonable standard - CIBSE Code M
- Report to include,
  - A commissioning plan, all systems inspected and commissioned in sequence
  - System test results confirming in line with design
  - Ductwork air leakage testing, when required
  - Commentary on variations where they are to be accepted
Criteria Four - Commissioning

Commissioning plans to be provided to the BCB before commencement of tests which:
- Identify systems to be tested
- Specify the tests to be carried out

Benefits
- Encourage the developer to think about commissioning at the appropriate point in the process
- Provide advance notice to the BCB as to what commissioning is proposed
Criteria Four – CIBSE Commissioning Codes

- Air
- Boilers
- Automatic Controls
- Lighting
- Refrigeration
- Water
- Management
- Electrical services

See also the BSRIA Commissioning Guides
Criteria Four – Air Permeability
Criteria Four – Air Permeability

Test method B to be employed
– Trickle vents temporarily sealed
– Method is better test of building envelope
– Recent calibration of kit
– Tester should demonstrate that appropriate training has been received
Criteria Four – Air Permeability

- Not worse than limiting value
- BER using measured air permeability not worse than TER
- < 500m² UFA no mandatory test but 15 m³(m²/h) @ 50Pa for BER calculation
- Failure to meet required standard
  - Remedial action required and retest
  - On retest target air permeability can be adjusted provided that:
    - No worse than 10 m³(m²/h) @ 50Pa, and
    - Compensating improvements are made elsewhere in the build to ensure TER is achieved
Criteria Four – Air Permeability

• Report by a suitable qualified person confirming that...
  – Air leakage test carried out in accordance with ATTMA Technical Standard 1 and by an appropriate person
    • A person registered by the British Institute of Non-destructive Testing in respect of pressure testing
  – Test results demonstrate that air permeability standard has been achieved
  – *Note the standard is as set in BER calculation, not the design limit*
  – Provide results within 7 days of final test
Criteria Four – Air Permeability

• Special arrangements for large, complex buildings
  – Audit of details and site supervision
  – Procedure described in ATTMA TS1

• Testing compartmentalised buildings
  (buildings divided into self-contained units with no internal connections)
  – Test a representative area following ATTMA guidance in TS1
  – In the event of failure, retest plus test a further sample area
Criteria Four - Accredited Construction Details

Current AD’s include for the development of an ‘Accredited Construction Details’ Scheme for linear thermal transmittances

Subsequent guidance issued stated that this will not be implemented for Non-Domestic Buildings and the following will apply:

‘the linear thermal transmittances values used within the BER calculation should be calculated following the guidance set out in BR 497 and be undertaken by a person who is competent to undertake such calculations’

The following slides are included for information only and related to the
Criteria Four - Accredited Construction Details
Criteria Four - Alternatives to ACD

1. to use the builder’s own details. In this case, the linear thermal transmittances should be calculated following the guidance set out in BR 497. When used in the BER calculation, the values so calculated should be increased by 25% because there is no independent assessment of robustness, and no historical evidence that the expected performance will be realised in practice.

2. to use unaccredited details, with no specific quantification of the thermal bridge values. In such cases, the generic linear thermal bridge values as given in IP 1/06 increased by 50% must be used in the BER calculation.

The alternative approaches 1) and 2) above are not mutually exclusive. For example, a builder could use accredited construction details for the majority of the junctions, but use a bespoke detail for (e.g.) the window head. In this case, the 25% margin would apply only to the thermal transmittance of the window head detail.
Criteria Four

(Linear Thermal Bridging)

3 proposed routes …

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CRITERIA FIVE – PROVIDING INFORMATION
Criterion Five

• Provide information about fixed building services to ensure efficient operation of the building.
• TER/BER data included in log book
  – Also include input data to allow future assessment of changes
• Provide owner/occupier with recommendations report from the EPC
• Identify how new building could be further improved
Criteria Five

For the User

for the Designer.....
Criteria Five

Building log book

Building name

Building address
Building address
Building address
Post code
Main telephone number
Building owner

Main occupants (if different)

Emergency contact details

Date

This building log book was prepared by:

Individual's name and organisation
Address: telephone number;
and e-mail address

This building log book is analogous to a car handbook, providing the facilities manager with easily understood information about how the building is intended to work. It also allows ongoing building energy performance and major alterations to be recorded.

Please ensure that this log book is kept up-to-date and in a readily accessible (designated) position, e.g. in the main building operations room. It contains important information for anyone carrying out work on the building and its services.

This log book is to be kept at all times in:

Electronic master is kept at:

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Appendix: relevant compliance and tests certificates
QUESTIONS ?