

Convention changes (Issue 8)

This document is going to help with the explanation of changes made to Issue 7 of Commercial EPC conventions. We will go through step by step of each amendment made to the wording and application of convention points which have been reworked.

Change number (1)

3.07 Appropriate Use of U and Km Values

Suitable qualification/accreditation is through membership of a recognised U-value calculation competency scheme (BBA/TISMA [UK]), OCDEA membership (England & Wales, Northern Ireland, Scotland) or any other scheme formally agreed between Accreditation Schemes/Approved Organisations and Government.

The change to this convention is the removal of “BBA/TISMA [UK]” as valid recognised U-value calculation competency schemes.

3.10 Appropriate Activity Selection for Animals Housed Overnight

~~For activities such as veterinary or similar building where space for housing animals is conditioned on a 24 hour basis 7 days a week, assessors should use the “C2A Secure Residential Institutions” as the building type and select the “Cell (police/prison)” as the activity type (the temperature values for this activity type are the closest to those associated with housing animals overnight).~~

~~For veterinary and similar buildings where there is no overnight stay or storage for animals then “C2 Residential Institutions – Hospitals and Care Homes” should be used at zone level and the animal holding area should be assessed as “store room”.~~

Except where specific factors require otherwise (evidence will be required):

1. For buildings such as kennels or catteries where the main purpose is housing animals, the overall building type should be “C2A Secure Residential Institutions”.
2. For buildings such as veterinary surgeries (where the main use profile is similar to that of a doctors’ or dentists’ surgery) the overall building type should be “D1 Non-residential institutions – Primary healthcare building”.

Within either type of building:

- a) Where animals are housed overnight the activity is expected to require conditioning on a 24 hour basis 7 days a week. Assessors should use building type “C2A Secure Residential Institutions” and “Cell (police/prison)” as the activity for the animal holding area.
- b) Where animals are housed during working hours but are not kept overnight, assessors should use building type “C2 Residential Institutions - Hospitals and Care Homes” and “Store room” as the activity for the animal holding area.

So, this convention tackles the issue of what to class building type/activity type of animals which are kept overnight or buildings that house animals like ‘kennels or catteries.

In bullet point fashion as the convention is quite simple enough, here is what you need to know:

Building type/Activity type

The building type selection should be:

- Building houses animals (kennels or catteries) = “C2A Secure Residential Institutions”
- Building similar to doctors or dentist (Veterinary surgeries) “D1 Non-residential institutions – Primary healthcare building”.

The activity selection for the individual zones should be:

- Animals kept overnight (conditioning expected 24/7) **Building type** "C2A Secure Residential Institutions" **Activity type** "Cell (police/prison)" as the activity for the animal holding area
- Animals kept in working hours (not overnight) **Building type** "C2 Residential Institutions – Hospitals and Care Homes" **Activity type** "Store room"

6.04 LTHW Boiler Efficiencies

The following hierarchy should be followed to establish suitable values for the 'Effective Heat Generating Seasonal Efficiency' for all boilers.

1. Use Enhanced Capital Allowance (ECA) product list part load values at 30% and 100%* - these should be used to calculate the seasonal efficiency as per the Non Domestic Building Services Compliance Guide (NDBSCG).
2. ~~Use ECA product list full load value* (when part load values are not given).~~
3. Use current PCDB values where available.
4. Use either manufacturer's information* or 'boiler plate*' information or information from manufacturer's technical helpdesk*. Where a gross efficiency value is established for a non condensing boiler then a deduction of 0.05 (i.e. 5%) should be made to it to convert it to an appropriate seasonal efficiency.
5. Use SAP 2005 tables (up to 70kW output).
6. Use suitable SBEM default; it is essential for the site notes to provide evidence as to why the above methods were not used to obtain a more accurate value, i.e. by providing evidence of failed attempts.

In addition to any boiler efficiency values established from the above the relevant heating credits should be added by following the guidance in the NDBSCG.

*Net efficiencies/values must be converted to gross efficiencies as per the NDBSCG.

The order has now changed for the suitable values in the hierarchy system for LTHW boiler efficiencies.

Point number **2. ECA** has now been completely removed with number **3. PCDB** taking its place.

6.08 Estimating the Local Mechanical Exhaust Specific Fan Power (SFP) in Existing Buildings

For Local Mechanical Extract systems only

0.5 W/l/s - buildings built to 2006 Building Regulations (2007 in Scotland)
0.4 W/l/s - buildings built to 2010 Building Regulations
0.3 W/l/s - buildings built to 2013- Building Regulations (or later)

For Mechanical Ventilation systems, whether defined at system level or at zone level

2.5 W/l/s - buildings built to 2006 Building Regulations (2007 in Scotland)
1.8 W/l/s - buildings built to 2010 Building Regulations
1.6 W/l/s - buildings built to 2013- Building Regulations (or later)

In addition to any specific fan powers established from the above, the relevant additional components from table 36 below should be added by following the guidance in the 2013 Non Domestic Building Services Compliance Guide.

This Convention has been amended to give an additional option for local mechanical extract for Buildings built post 2013.

In addition the Convention now provides SFP values that should be used for mechanical ventilation systems as well as local mechanical exhaust. These values are centred around the same age bands (2006/2010/2013) as for local mechanical extract.

The Convention also now includes a table of additional components that should be factored into the SFP entry when one of the post 2006 values has been chosen.

So for example, a building that was built in 2010 with mechanical ventilation (1.8 w/l/s) and an additional return filter for heat recovery (+0.1 w/l/s) should have an SFP of 1.9 w/l/s

6.12 Kitchen Area Extraction

All kitchen area extraction or mechanical ventilation equipment is to be included as part of the SBEM assessment process, in order to account for the additional energy requirements for the conditioning of higher air change rates. i.e. extractor hoods are no longer to be disregarded and are to be assessed as part of the extraction rate for the zone(s) concerned.

If performance details of extraction units are unknown then defaults should be assumed in accordance with CL6.07 'Estimating Local Mechanical Exhaust rates in existing buildings' with the following table provided for additional guidance:-

- SFP = 0.4 for the circumstance where the fan is within the zone
- SFP = 0.6 where the fan is outside the zone.

Assessors should endeavour to obtain and utilise the performance details of all extraction equipment identified as part of their assessment in accordance with CL6.07 within Conventions Issue 2 with convention 6.07. However, where it is not possible to identify all of the equipment in any given zone, the defaults shown in the table above for 'Assumed Extract Rate' shall be used.

In addition, in order to remove a degree of the "process power" of the fan itself, the assessor should select the following additional default exhaust specific fan power values:-

- SFP = 0.4 for the circumstance where the fan is within the zone
- SFP = 0.6 where the fan is outside the zone.

For Local Mechanical Extract systems only

- SFP = 0.4 for the circumstance where the fan is within the zone
- SFP = 0.6 where the fan is outside the zone.

For Mechanical Ventilation systems, whether defined at system level or at zone level

- SFP = 0.8 for circumstance where the SFP is unknown
- SFP = entered as 50% of the actual SFP in order to remove the "process power" element

Even if the SFP is defined at system level, it only applies to the kitchen zone.

This Convention change follows a similar theme to the previous change just discussed and now includes SFP values to enter when a mechanical ventilation system is present.

When the SFP is unknown it should be entered as 0.8 and when it is known 50% of the actual SFP should be entered to remove the 'process power' element.

So, for example if a mechanical ventilation system is present with a known SFP of 1.4 the SFP value entered at zone level for the kitchen area should be 0.7 (50% of 1.4). This change is only made at zone level and the system level value should not be altered at all.

6.13 Identifying Indirectly Conditioned Zones

Where a zone is without any form of fixed conditioning equipment, but at least 50% of the surrounding envelope area ~~excluding~~ including party walls, party floors and party ceilings is adjacent to directly conditioned space, ~~(or for party envelopes is assumed to be adjacent to conditioned space)~~, then it will be assumed to be indirectly conditioned.

A zone which has no fixed conditioning equipment but is being treated as “conditioned adjoining space” by applying assumed heating following convention 6.11 and appendix 10.07 is ~~NOT considered to be directly conditioned and cannot contribute to indirectly conditioning any adjacent zone.~~ IS considered to be directly conditioned and does contribute to indirectly conditioning any adjacent zone.

Wording changes on the convention which have completely changed the modelling process of indirectly conditioned zones. Previously zones which had the assumed heating system assigned (Convention 6.11) were not considered to indirectly heat adjoining zones, however they should now be considered as being heated for any indirect conditioning calculation.

7.01 Lighting Options in SBEM

If the circuit wattage and lux values cannot be ascertained by either of the above methods it may be possible to use the ‘Lighting chosen but calculation not carried out’ option where ~~BOTH~~ the lumens per circuit wattage (lm/cw) and light output ratio (LOR) must be entered, ~~calculated in line with building regulations guidance.~~ This may not be possible for all zone activity selections. The evidence of how any values used have been obtained must be provided in the site notes.

- a) If the ~~lm/cw~~ are known for the entire light fitting including the integral lamp(s) or LED chip(s) the LOR is 1
- b) If the ~~lm/cw~~ are known for the lamp the LOR for the luminaire also must be obtained in order to use this information; except in the case of directional (downlight type) lamps which are not shielded by the luminaire or behind a diffuser in which case the LOR is 1
- c) A “bulb” type lamp is not directional, so the LOR cannot be assumed to be 1 even if the bulb is not within a fitting or shade.

This Convention now provides detail on what the LOR entry should be when the ‘lighting chosen but calculation not carried out’ option is chosen.

When the lm/cw value includes the lamp/chip the LOR value should be entered as 1.

For any directional/downlighter type bulb the LOR should also be 1.

However ‘bulb’ type lamps cannot be assumed to have an LOR of 1 so when the lm/cw is known for bulb lamps this can only be entered if the LOR is also specifically known.

7.04 Display Lighting

Where zones incorporate an activity whereby ~~software~~ SBEM automatically assumes the presence of display lighting but none is actually present, the display lighting efficiency for SBEM shall be entered such that it is the same as that of the general lighting present in that zone.

Where possible ~~this~~ the display lighting efficiency should be calculated but as this requires detailed measurements of the ~~lm~~ and ~~cW~~ this is not usually practical in existing buildings. The following 'default' values should therefore be used:

1. For all ~~general~~ lamp types except Tungsten or Tungsten Halogen; you must enter that the display lighting uses efficient lamps and enter 50lm/cW in the relevant Lumens per circuit wattage box, unless a specific ~~lm/cW~~ value from a lighting design ~~exists~~ is known.
2. For Tungsten or Tungsten Halogen lamps; you **do not** enter that the display lighting uses efficient lamps and you do not have to enter a value in the Lumens per circuit wattage box.
3. Where a zone contains a mixture of lamp types providing display lighting and some, but not all, are efficient lamps; you must enter that display lighting uses energy efficient lamps and enter a weighted average of the ~~lm/cW~~ based upon the number of lamps in the relevant Lumens per circuit wattage box. The weighted average is calculated using 50 ~~lm/cW~~ for efficient lamps and 15 ~~lm/cW~~ for Tungsten or Tungsten Halogen lamps.

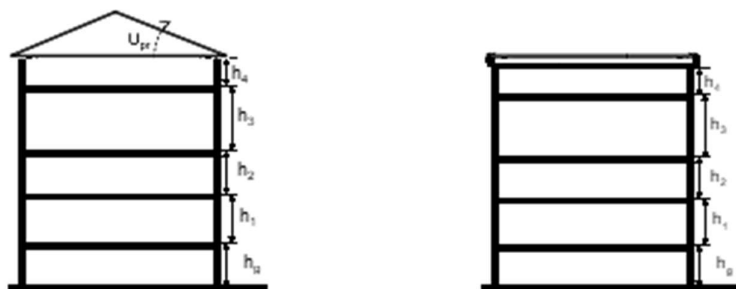
Just a few bits of additional information to help explain the convention.

Dimension Convention

The following convention section is completely restructured for Issue 8.0. For comparison purposes only, the previous version is included in appendix A.

General principles

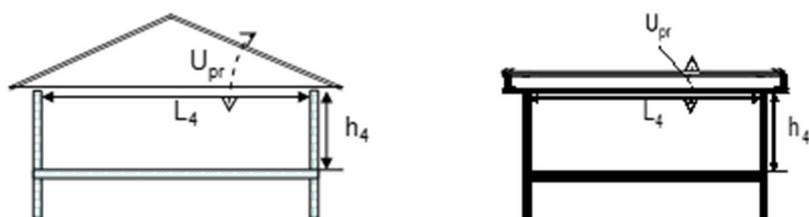
- For ground and intermediate floors
 - Zone height is top of floor to top of floor
 - Wall areas are calculated from top of floor to top of floor (*which will include the area of walls above dropped ceilings*)
- For top floors
 - Zone height is top of floor to soffit/underside of roof slab unless there is a lower ceiling of a type which is an effective thermal boundary that limits the extent of the conditioned space (*see below*)
 - Wall areas are calculated from top of floor to underside of the effective thermal boundary (*the total area exposed to the inside temperature*)
- For the roof
 - The U value is from under ceiling to outside roof including any insulation located within the construction(s)
 - The envelope area is the total area exposed to the inside temperature (*which will be greater than the zone area unless the ceiling is flat*)



Specific examples

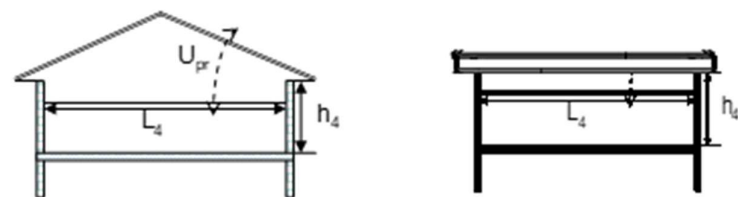
For top floors with a flat ceiling at eaves level

- Zone height is top of floor to underside of soffit/eaves level (h_4)
- Area of walls are those below soffit/eaves level i.e. length L_4 x h_4



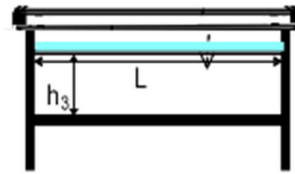
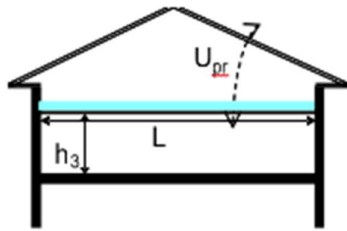
For top floors with dropped **permeable ceiling without insulation** at ceiling level

- Zone height (h_4) is top of floor to underside of soffit/eaves level (not ceiling)
- Side and end wall areas are calculated to soffit/eaves level i.e. dropped ceiling is treated as though it is at soffit/eaves level



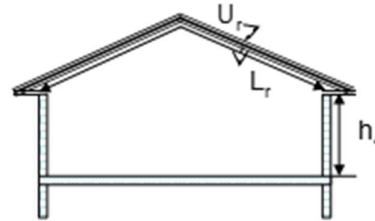
For top floors with dropped **non-permeable ceiling** with or without insulation at ceiling level or **permeable ceiling with an insulation layer across the entire ceiling**

- Zone height (h_3) is top of floor to underside of ceiling
- Side and end wall areas are calculated to underside of ceiling i.e. L x h_3



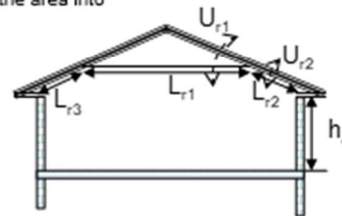
- For rooms with pitched ceiling (e.g. where ceiling is fixed in line of pitched roof)

- Zone height (h_4) is top of floor to underside of soffit/eaves level (*not* average room height)
- Roof heat loss area is as seen from underside of ceiling, i.e. $L_r \times d$ (zone depth)
- U value is from under ceiling to outside roof (U_r)
- End wall area is whole gable up to roof apex (as this is all exposed to inside temperature)



- If there is a horizontal ceiling half way up the pitched roof, split the area into

- The part with a void (L_{r1}), using the U-value including the void (U_{r1})
- The part where there is no void (L_{r2} , L_{r3}), using the U-value without a void (U_{r2})
- Zone height is still to underside of soffit/eaves level



the general rule is always to input the area exposed to the inside temperature, and the U-value between this surface and outside.

For the purposes of this convention the following ceilings, as seen from underneath, are to be considered non-permeable or permeable to the movement of air:

Non-Permeable Ceilings

- Plasterboard Ceilings
- Lath & Plaster Ceilings
- Seamless PVC ceiling
- OSB board, Chipboard or plywood ceiling
- in situ concrete ceiling
- beam & block with concrete screed ceiling
- Seamless aluminium or metal ceiling

Permeable ceilings

- Suspended ceiling tiles in a grid
- Louved timber, metal or plastic slatted ceiling
- Perforated aluminium or metal ceiling

Large parts of this Convention have now been rewritten so it is important that assessors read through all the changes and understand what is now required of them.

The main changes centre around the fact that permeable and non-permeable ceilings should be treated differently for the purposes of zone heights and wall areas.

10.07 Zones without Fixed Conditioning Equipment

To be applied in circumstances where the zone(s) or building being assessed has some or all of its building services missing and is subject to the requirements of a first fit out – e.g. Shell and Core. In this circumstance, the assessor must determine which type of building service would likely be installed (the assessor should record justification of this in their Site Notes) and assign the minimum efficiency allowed under Part L. This is done by referring to Approved Document L2 (2021) , and assigning the minimum energy efficiency standard that is stated for that particular system/building service.

This Convention applies to Shell and Core buildings awaiting fit out and outlines what approach assessors should follow. Assessors must make an assessment on what type of system is likely to be installed and assign the minimum efficiency allowed under Part L of the Buildings Regs.