

## Information Required for Part L2A Compliance Modelling

---

A listing of information necessary for the completion of 'as-designed' and 'as-built' Building Regulations Part L2A SBEM and DSM compliance assessments and EPCs.



## Introduction

---

The information listed below covers all the parameters required for the completion of a Building Regulations Part L2A compliance assessment. This covers both Level 4 'Simplified Building Energy Model' (SBEM) and Level 5 'Dynamic Simulation Method' (DSM) assessments.

For 'as-designed' assessments; where information is not yet available, suitable assumptions will be made by the energy assessor and described within an accompanying report. These assumptions shall act as a guide towards achieving compliance.

For 'as-built' assessments and Energy Performance Certificates (EPCs), supporting information will be required to substantiate all inputs made. These will generally be composed of 'as-built' status drawings and specification documents. The accompanying report provided alongside the statutory Part L2A BRUKL compliance documents shall confirm any outstanding information.

The information listed below is required to carry out these assessments:

## Building Regulations and Location

---

### 1. Building Regulations Revision:

Confirm which revision of the Part L2A Building Regulations the building is to be assessed under. Most new buildings are assessed under ADL2A 2013, however some buildings remain under ADL2A 2010. For certainty – confirm with the building inspector.

### 2. Confirm the Building Address:

For as-design assessments, the outline address shall be sufficient information. For as-built assessments and EPC's, the postal address as lodged with the Post Office shall be necessary.

## Architectural Information

---

### 3. Geometry:

Confirm the form and layout of the building by providing architectural plan, elevation and section drawings (including roof plan). **A site plan showing a north point** is also important in order to orientate the model.

### 4. Construction Fabric:

Confirm the construction fabric design U-Values and materials compositions using architect's specifications and/or construction details. If these are not available, confirm the basic construction types to be specified as a minimum (e.g timber frame/ masonry).

For windows, confirm the U-Value for the entire window –glazing and frame. If using tinted glazing, confirm the g-value (energy absorbance) and Lt-value (light transmission) metrics. Otherwise, confirm that clear glazing is to be specified.

### 5. Junction Details:

Confirm if the architect intends to specify 'accredited construction details' in respect of reducing thermal bridging at the construction element junctions. For buildings using composite insulation panels, confirm if proprietary manufacturer's construction details shall be used at junctions. Demonstration that these details are achieved on-site will be required for as-built assessments and EPCs.

### 6. Air Permeability:

Confirm the design air permeability of the building in units of  $m^3/(m^2.hr)@50Pa$ . Buildings with a useful floor area greater than  $500m^2$  must be air pressure tested and must achieve an air permeability  $<10m^3/(m^2.hr)@50Pa$ . Air pressure testing of smaller buildings is not mandatory, however a default rate of  $15m^3/(m^2.hr)@50Pa$  must be used within the SBEM or DSM assessment. Typically a rate of  $<5m^3/(m^2.hr)@50Pa$  is targeted. Completion of as-built assessments and EPCs require an air pressure test certificate by a suitably trained person. See ADL2A 2013 clause 3.10 for details.

## HVAC

---

### 7. HVAC Overview:

Provide an overview of the HVAC services serving the building. Confirm the HVAC mode for each zone of the building using suitable HVAC philosophy drawings, room datasheets and/or a written description.

### 8. Space Heating Plant:

Confirm the mode(s) of space heating and the fuel type of the heat source(s). For gas boilers, confirm the Part L2 Seasonal Efficiency. For heat pumps, confirm the Seasonal Co-efficient of Performance (SCoP), or if not available, the nominal Co-efficient of Performance (CoP). Alternatively, provide a product datasheet or reference to the heating plant make and model.

### 9. Circulation Pumps:

For wet heating system circulation pumps, confirm if the circulation pumps are:

- Fixed speed.
- Variable speed with pressure sensor in pump.
- Variable speed with pressure sensor in system.
- Variable speed with multiple pressure sensors.

### 10. Space Cooling Plant:

Confirm the energy efficiency of space cooling plant by providing the Seasonal Energy Efficiency Ratio (SEER) data for the plant, or if not available, the nominal Energy Efficiency Ratio (EER).

### 11. Mechanical Supply and Extract Ventilation:

Confirm zones served by either local heat recovery units (HRUs) or whole building air handling units (AHUs) using suitable mechanical ventilation drawings, schedules and specifications. For both items of plant, confirm;

- The Specific Fan Power (SFP) of the plant in units of W/l/s. This includes both supply and extract fans.
- The mode of heat recovery (none/flat plate/thermal wheel).
- The seasonal efficiency of the heat recovery matrix.
- Whether the heat recovery matrix is equipped with a by-pass damper.
- The mode of controls to the unit –specifically whether the flow rate of the unit will be modulated by speed or a damper based upon gas sensors and/or PIR controls.

## 12. Mechanical Extract Ventilation:

Confirm zones served by mechanical extract fans using suitable mechanical ventilation drawings, schedules and specifications. For each fan, confirm:

- The maximum flow rate from the fan/extract terminal.
- The SFP of the fan (accounting for any flow rate losses resulting from ducting).
- Whether the fan is local to the room it serves (eg, a 'through wall' type fan), or whether the fan is located separately from the zone it serves, utilising ducting (eg, an 'MEV' ducted type system).
- Controls to the fan (is the fan manual or controlled via a PIR/light switch etc).

## Hot Water Generation

---

### 13. Hot Water Heating Plant:

Confirm the mode of hot water heating (e.g by space heating boiler, stand-alone system, instantaneous electric etc). For gas fired boilers, confirm the Part L2 Seasonal Efficiency. For air-to-water heat pumps, confirm the Seasonal Co-efficient of Performance (SCoP) of the unit, or if not available, the nominal Co-efficient of Performance (CoP).

### 14. Hot Water Storage:

If the hot water heating system is a storage system, confirm the volume of water stored and the standby storage losses from the cylinder(s). Alternatively provide the make and model of the cylinder(s). This calculation should include the capacity of any buffer cylinders used in conjunction with CHP units, air-to-water heat pumps or other LZC technologies.

### 15. Hot Water Secondary Circulation:

Confirm if the hot water heating system includes a secondary circulation loop. If secondary circulation is include, confirm;

- The loop length in metres (the length of the pumped loop only, not including dead legs).
- The average thermal losses from the loop in units of W/m.
- The power of the secondary circulation pump in Watts.
- Whether a time switch is included.

### 16. Solar Thermal Water Heaters:

Confirm if a solar thermal hot water heating system is present and confirm the following parameters;

- Active collector area.
- Azimuth of collectors (orientation).
- Inclination of collectors.
- First order heat loss co-efficient A1 (alternatively provide make & model).
- Second order heat loss co-efficient A2 (alternatively provide make & model).
- Dedicated solar thermal storage cylinder volume (if applicable).
- Dedicated solar thermal storage cylinder stand-by heat losses (if applicable).
- Heat transfer rate of heat exchanger in units of W/k.

## Lighting

---

### 17. Performance of Luminaries

Confirm the parameters of lighting serving each room using suitable lighting drawings, schedules and datasheets. Lighting can be input into the assessment using two modes. The data necessary for each mode of data entry is given below:

#### **Inference using Efficacy and Lighting Output Ratio Data:**

Provide lighting drawings or schedules which confirm the luminaire types in each room. If different types of luminaire serve a single room, provide drawings which indicate their location. Confirm the efficacy of each luminaire type by indicating the 'Lumens per Circuit Watt' (Lm/W) of the luminaire (not the lamp). This can usually be sourced from product datasheets. Alternatively, provide the efficacy of the lamp (not the luminaire) and the Light Output Ratio (L.O.R) of the luminaire. This information can also often be found on product datasheets.

#### **Full Lighting Design:**

Confirm the design lux level and wattage of lamps in each room by using a suitable lighting calculation software package such as 'Relux'. Indicate the lighting power density in terms of  $W/m^2/100lux$ .

#### **Notes:**

If providing lighting layout drawings which display different luminaire types as symbols, ensure that a key is provided to indicate what each symbol means. If no key is provided, the information is of no use. Likewise, if providing Relux plots, ensure each plot is given a suitable title in order to identify the space within the building. If detailed information of lighting is unavailable, confirm the basic lighting types to be specified, eg LED, compact fluorescent, fluorescent strip lights etc.

### 18. Lighting Control Types:

Confirm the control mode for lighting within each room, indicating whether controls shall be manual / auto-on-off / manual-on-auto-off etc.

Confirm if photo-sensitive (daylight sensing) controls shall be specified, confirming if these shall provide switching or dimming to lighting. Also confirm whether a separate photo-sensor shall be specified to the rear half of the controlled zone.

This information can be shown using suitable lighting drawings.

## Energy Sub-Metering and PFC

---

### 19. HVAC Sub-Metering:

Confirm if HVAC systems are or are not sub-metered.

If HVAC systems are sub-metered, confirm if the system warns for 'out-of-range' readings (eg via a BMS system which provides alerts for readings which are off-trend).

### 20. Lighting Sub-Metering:

Confirm if lighting systems are or are not sub-metered.

If lighting systems are sub-metered, confirm if the system warns for 'out-of-range' readings (eg via a BMS system which provides alerts for readings which are off-trend).

### 21. Power Factor Correction (PFC) Equipment:

Confirm if power factor correction equipment is specified, indicating the correction factor achieved (0.9-0.95 or >0.95). If no correction factor equipment is specified, a default figure of <0.9 shall be used.

## Low and Zero Carbon Technologies

---

Confirm the presence of any of the following low or zero carbon technologies incorporated within the scheme:

- Photovoltaic panels.
- CHP units.
- Wind turbines.

The following parameters are necessary for each technology:

### 22. Photovoltaic (PV) Panels:

Indicate the active area of panels specified, the type of panel proposed and the location of the panels (using a suitable drawing or description). Alternatively, if a feasibility study has been carried out by a PV installer, confirm the estimated yield from the array in terms of kWh/yr.

### 23. CHP Units:

#### For SBEM:

Confirm the estimated average annual percentage input of thermal energy into a) the space heating system and b) the hot water heating system via the CHP unit. This is a calculation that the heating engineer should carry out which shall assess the monthly inputs from the CHP unit into the space heating/domestic hot water system. An average (mean) of the monthly sums should be used in order to provide an annual average.

Also confirm;

- Fuel type.
- Thermal seasonal efficiency.
- Heat to power ratio.

Alternatively provide details of the make and model of the CHP unit.

#### For DSM, confirm:

- Fuel type.
- Heat output, thermal efficiency and power ration at maximum output.
- Heat output, thermal efficiency and power ration at minimum output.
- Controls employed; lead boiler on continuously, only on during space heating season etc.

Average annual contribution calculations are not necessary when conducting as a DSM assessment.

### 24. Wind Turbines:

For wind turbines, confirm;

- The terrain type; smooth flat countryside (no obstruction) / farmland with boundary hedges / suburban or industrial area / urban with average building height >15m.
- The hub height and rated power of the turbine.
- Swept area, or blade diameter if appropriate.